

# ClearPath OS 2200 IDE for Eclipse Getting Started Guide

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## **Version Control**

Version	Date	Summary of Changes
1.0	4 Mar 2011	Initial draft
1.1	20 Apr 2011	Added template notes plus C and FORTRAN info.
1.2	5 May 2011	Added info on obtaining updates
1.3	25 May 2011	Minor updates
2.0	Feb 2012	Upgrade for Eclipse 3.7. Added UCOB debug notes.
2.1	Mar 2012	Added more Unisys branding. Added RDMS-JDBC client information.
2.2	June 2012	Updated for Eclipse 3.7.0.4 IC. Includes MHFS topics.
2.3	Oct 2012	Added info on Java and Unisys RAs
3.0	July 2013	Based on 3.7.2 IC2. Moved Java and Unisys RAs to another guide.

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## Introduction

#### Overview

Traditionally many OS 2200 clients have used editors like ED and IPF to maintain their 3GL programs such as COBOL, FORTRAN and C. Unisys has enabled the OS 2200 environment to run many Java solutions including a Java Virtual Machine (JVM) that can run on a J-Processor specialty engine or on OS 2200, Java access to DMS/RDMS/BIS databases and the JBoss Java EE environment. Eclipse is the leading open source IDE and is based on Java. Unisys has added a plug-in to Eclipse to support the development of legacy 3GL programs developed in COBOL, FORTRAN, C and other languages. The Unisys plug-in also assists in the development of composite applications.

The Unisys ClearPath OS 2200 IDE for Eclipse provides many features including:

- Windows containing the entire program source
- Easy navigation being open windows
- Windows GUI features like search, copy/paste & drag/drop
- Content Assistant to provide COBOL structures and statements for the programmer
- Use of different colours for reserved words, comments and variables
- Error windows for compilations with links to source code lines
- Ability to update OS 2200 source files including ECL and COBOL
- Ability to build a project (e.g. compile programs) with compilation on the OS 2200 host
- Compare differences with older code versions
- Support COBOL, Java, Java EE, C and other development languages from a single tool
- Supports interactive PADS debugging for UCS programs.

As the ClearPath OS 2200 IDE for Eclipse runs on the programmer's PC, OS 2200 CPU cycles associated with editing code are off-loaded from the OS 2200 host. The productivity of OS 2200 programmers is expected to improve from using the IDE. The ClearPath OS 2200 IDE for Eclipse should also assist OS 2200 clients in finding new programmers as many OS 2200 proprietary commands and tools are not used.

## Purpose

The purpose of this document is to assist OS 2200 programmers in understanding and using the Unisys ClearPath OS 2200 IDE for Eclipse for 3GL development through screen snapshots and written descriptions. This document is based on the Unisys ClearPath OS 2200 IDE for Eclipse 3.7.2 IC2 release.

This document was compiled with the help of numerous Unisys colleagues both in the Eclipse engineering team and field delivery staff. Any changes or suggestions to this document should be emailed to Robert Jamieson (mailto://robert.jamieson@unisys.com).

## Projects are the Core of an IDE

Eclipse is an open source IDE that Unisys has developed plug-ins for so it works with OS 2200 environments. IDEs are designed to work with projects and Eclipse is no different. However Unisys has provided some additional features like OFCS to assist to the OS 2200 developer. OFCS does not use Eclipse projects and therefore some functionality may not be available when using OS 2200 files and elements that do not belong to an OS 2200 project in your workspace.

## Terminology

Throughout this document, the Unisys ClearPath OS 2200 IDE for Eclipse is often referred to as simply Eclipse.



## **Related Documents and Information**

Eclipse IDE for OS 2200 Installation Guide (47292107-005) CIFS for ClearPath OS 2200 User, Programmer and Administrator Reference Manual (78596137nnn)

Acronym	Definition
Eclipse	Open Source IDE
IDE	Integrated Development Environment
Dorado	Unisys ClearPath Plus server running OS 2200 and Windows OS
АСОВ	ANSI COBOL-74 compiler with Unisys extensions
UCOB	ANSI COBOL-85 compiler with Unisys extensions
CIFS	Common Internet File System
ADMLP	DMS2200 preprocessor
MHFS	Multi-Host File Sharing
OFCS	Open File from Configured Serrver

## **Definitions and Acronyms**

**Table 1 - Definitions and Acronyms** 

## Installation

This section describes how to install the Unisys ClearPath OS 2200 IDE for Eclipse and related software products on a developer's workstation. For a more detailed description of the installation process please refer to the related production information mentioned earlier.

## **Hardware Requirements**

The workstation should have at least 2GB memory to perform at a satisfactory level. However 4GB memory is recommended.

## **Download Files to Install**

Download for the ClearPath OS 2200 IDE for Eclipse All-In-One is available from <u>ftp://ftp.support.unisys.com/pub/2200/IDE/Eclipse-2200-3-7-2/</u>. The following shows the contents of this download site.



#### FTP directory /pub/2200/IDE/Eclipse-2200-3-7-2/ at ftp.support.unisys.com

To view this FTP site in Windows Explorer, click Page, and then click Open FTP Site in Windows Explorer.

```
Up to higher level directory
```

02/25/2013	08:13AM	3,495,525	38393831-002.pdf
01/30/2013	12:54AM	325,137	47292107-005.pdf
07/01/2013	08:53AM	Directory	Archive
03/06/2013	01:24AM	802,556	Eclipse 3-7-2 Differences.pptx
07/01/2013	08:22AM	281,035,911	eclipse-2200-all-in-one-3-7-2-2-20130627.zip
06/27/2013	03:36AM	82,876	Eclipse-2200-BestPractices-Limitations.pdf
07/01/2013	08:03AM	Directory	Eclipse-2200-ca-3-7-2-2-20130627-UpdateSite
07/01/2013	08:01AM	9,384,448	Eclipse-2200-ca-3-7-2-2-20130627-UpdateSite.jar
02/25/2013	06:53AM	860,926	Eclipse2200padslib37.zip
07/01/2013	08:58AM	66,656	Quick Start.rtf
07/01/2013	08:54AM	10,749	ReleaseNotes.txt

There are two options for installing Eclipse.

Choose one of the following options:



1. Install ClearPath OS 2200 IDE for Eclipse All-In-One eclipse-2200-all-in-one-3-7-2-2-20130627.zip

A package containing a complete installation of Eclipse, Web Tools, Data Tools, and other associated features including the Unisys Composite Application. For details and configuration instructions, see Section Three of the Installation Guide.

Use this option if you are not currently using Eclipse as an IDE.
Install ClearPath OS 2200 IDE for Eclipse Composite Application Feature <u>eclipse-2200-ca-3-7-2-2-2013-0627-updatesite.jar</u> The ClearPath OS 2200 IDE for Eclipse Composite Application Feature is ready to install in your existing installation of Eclipse. For details and configuration instructions, see Section Three of the Installation Guide. Use this option if you are using Eclipse already as an IDE and just want to add the Unisys OS 2200 feature.

## Install the Java Environment

Double click on the *jdk-nnnn-windows-i586.exe* file. This will launch the Windows Installer to install the Java environment on your workstation. Take the defaults (recommended).

## Installing ClearPath OS 2200 IDE for Eclipse

- Identify a folder on your workstation to install Eclipse..
- Unzip the <u>eclipse-2200-all-in-one-3-7-2-2-20130627.zip</u> file to this folder.

#### Host OS 2200 Software Dependencies

The host OS 2200 Software Dependencies can be found in the Installation Guide. Basically you need CIFS (6R2 or later) and CPCOMM/CPCOMMOS.

#### Configuring an OS 2200 Telnet Session

Eclipse uses a Telnet session to the OS 2200 host for some functions so a Telnet process needs to be configured in CPCOMM/CPCOMMOS. An example is:

PROCESS, TELRSI PASSWORD, RSI

. Telnet

SILAS also needs to be configured for Telnet. For example:

INTERNET-ADR,INTADD ; TELNET-ATTACH-NAME,TELRSI TELNET-ATTACH-PASSWORD,RSI ; TPO-ATTACH-NAME,TPORSI TPO-ATTACH-PASSWORD,RSI

#### **CIFS** Parameter Setting

PROCESS, RSDCSU

The CIFS parameter CIFS\$WAITROLBAK determines how long before CIFS responds to Eclipse when the OS 2200 file is rolled-out. By default, this parameter has a value of 600 seconds. It is recommended to set this value to 1 in the CIFS-BACK runstream so the user gets an immediate response.

## Starting ClearPath OS 2200 IDE for Eclipse

## **Eclipse 3.6 Migration Considerations**

This section only applies if you are installing Eclipse 3.7 on a workstation that was running Eclipse 3.6.

Eclipse maintains host and login details in two XML files that are local settings for each user. The files are HostAccount.xml and LoginAccount.xml. The location of the XML files is



#### Windows XP

C:\Documents and Settings\<User>\Local Settings\Application Data\Unisys\os2200\ide

Windows Vista \ 7

 $C: \label{eq:local_loc$ 

The format of these files has changed with Eclipse 3.7 and the 3.6 format is incompatible. You should delete these files when installing Eclipse 3.7. Host connection and login details will need to be reentered. However if you do intend to run both Eclipse 3.6 and 3.7 on the same workstation, you may want to save the 3.6 files to a different name when using 3.7. Restore them when using Eclipse 3.6 after saving the 3.7 files.

## Launching Eclipse

Eclipse can be launched by the following steps:

• Use Windows Explorer to expand the folder where Eclipse was installed

Name
Configuration
Configurati

• Double-click on the **eclipse.exe** file

Note: It is recommended to create a short-cut from the Eclipse.exe file and place on your desktop. Eclipse will display the following screen. Note that Eclipse 3.7 is based on the Indigo release from the Eclipse Foundation.



#### Selecting the Eclipse workspace

Eclipse will display the following window asking for the workspace location. Normally this is found in the Documents and Settings folder for the user but you can use another location. In the example below, the workspace is C:\Eclipse3-7 Workspace.

Check the box if you don't want this window to appear in future.

U Workspace Launcher		×
Select a workspace		
Eclipse stores your projects in a folder called a workspace. Choose a workspace folder to use for this session.		
Workspace: C:\Eclipse 2200 3.7 Workspace		Browse
Use this as the default and do not ask again		
	ок	Cancel

The start-up option to prompt for the workspace can be set in the Eclipse preferences. Go to Window  $\rightarrow$  Preferences  $\rightarrow$  General.

U Preferences	
▼ Preferences         type filter text         → General         → Appearance         → Build         → Capabilities         → Compare/Patch         → Editors         → Reys         → Network Connections         → Perspectives	Workspaces         ✓ Prompt for workspace on startup         Number of recent workspaces to remember: 5 ★         Recent workspaces         C:\Eclipse 2200 3.7 Workspace
<ul> <li>Perspectives</li> <li>Search</li> <li>Security</li> <li>Service Policies</li> <li>Startup and Shutdown</li> <li>Workspaces</li> </ul>	

#### **No Workspace Prompt**

On occasions, Eclipse will launch with a Workspace even when the user has requested to prompt for the workspace. There have been issues with the prompt for workspace at the startup. Some of the forums they have been discussing about this and one of them is:

http://stackoverflow.com/questions/7058782/eclipse-default-workspace-problem

One option is to start Eclipse with the following option.

<eclipse path>/eclipse.exe -clean

If you have created a shortcut on the desktop, right click on the shortcut and click on properties and append the key "-clean" to the target path.

#### Selecting the Eclipse workbench

For first time users, Eclipse will display a welcome screen similar to the following.



THE REPORT OF	Contraction of the Law of March 1		7-	1214 03 2200
2200 Explorer 🕄 🥂 🗖	1		<ul> <li>Weikome</li> </ul>	N ST
				· · · · · · · · · · · · · · · · · · ·
			0	Overview Cet an overview of the leatures
			8	Tubortalis Go tvough hitoitats
			3	Samples Ty of the samples
			0	What's New Find out what is new
	S2200 Host Manager View - CIFS	🖉 Taska 🔝 Problems 🛛 🕹 🕼 😂 🖅 " 🗆	-	Workbench Go to the workbench
	Host Name	Connection Status		
	S COOL MA LUS JMESYS, COM	Disconnected	T	

Close the Welcome view. The result will be the Eclipse workbench similar to below.

092221 filese						「「「」」
PE DA Seege Seatt Potel But C	S200 WHAT THE	in all same				-
TT IL	LIN LIN A.A.A				P. BUR ARA II.	14) T 01100
Characterization and a second					an oddra a bol ave	44
	1, OS 2000 Host Manager Verv - C2FE	D Tarla 2 Instans			-	
	not New	Einsteiton Ratas	Line-85	95	Connection Name	
	Bernard and an	Connected	(anistar)	05 2208	RSTER	
	Restrictions in	Decartected	(Serension)	199.2200	POST	
	COOL INSUM ANTING COM	Converted	12000001	05 2208	000	
	3/13/150					
50	R				1	

At the top right, you will see a box containing "OS 2200". This is known as the Eclipse perspective. Different perspectives are available e.g. Java. By default the OS 2200 perspective is set as the default when installing the all-in-one release.



## **Eclipse Help for Unisys Plug-ins**

Go to **Help**  $\rightarrow$  **Help Contents**.



## **Understanding OS 2200 Projects**

## **Configuring Eclipse Preferences**

Before we start defining an OS 2200 project, we have to configure Eclipse to support the OS 2200 environment. In the menu bar, go to **Window**  $\rightarrow$  **Preferences** and click.

Window	Help			
New W	/indow			
New Editor				
Open I	Perspective	•		
Show Y	/iew	•		
Custor	nize Perspective			
Save P	erspective As			
Reset Perspective				
Close F	Perspective			
Close /	All Perspectives			
Naviga	ation	•		
Prefer	ences			

The following screen will appear:



Preferences		_ 🗆 🗙
type filter text	General	$\leftarrow \star \Rightarrow \star \bullet$
<ul> <li>General</li> <li>Ant</li> <li>C/C++</li> <li>COBOL</li> <li>Data Management</li> <li>Fortran</li> <li>Help</li> <li>Install/Update</li> <li>Java</li> <li>Java EE</li> <li>Java Persistence</li> <li>JavaScript</li> <li>Mylyn</li> <li>Plug-in Development</li> <li>Plus Preferences</li> <li>Remote Systems</li> <li>Run/Debug</li> <li>Server</li> <li>Team</li> <li>Terminal</li> <li>Usage Data Collector</li> <li>Validation</li> <li>Web</li> <li>Web Services</li> <li>XML</li> </ul>	<ul> <li>Always run in background</li> <li>Keep next/previous editor, view and perspectives dialog open</li> <li>Show heap status</li> <li>Open mode</li> <li>Double click</li> <li>Single click</li> <li>Select on hover</li> <li>Open when using arrow keys</li> <li>Note: This preference may not take effect on all views.</li> </ul>	lts Apply
?	OK	Cancel

#### **Displaying the Java Heap Status**

If you check the "Show heap status" option above, Eclipse will show the Java heap status in the status line:

15M of 269M 🛛 📋

This information can be useful to provide in some cases as requested by Engineering. Clicking the garbage bin icon will initiate a Garbage Collection task.

#### Configuring the Unisys COBOL preferences

Click on the entry COBOL (and not the '+' sign) to display this screen:



Preferences		_ 🗆 🗙
type filter text	COBOL	← → → → ▼
🕀 General		
📺 - Ant	COBOL Settings:	
<u>⊕</u> <u>C/C++</u>		
ĒCOBOL		
🗄 Data Management		
🗄 - Fortran		
⊕ Help		
庄 ·· Install/Update		
🛨 - Java		
⊕- Java EE		
Java Persistence		
⊞-Mylyn		
Plus Preferences		
E Remote Systems		
E Server		
Terminal		
Terminar Tel: Usage Data Collector		
Validation		
The Web		
+ Web Services		
0		Cancel
U	OK	

Check the Unisys UCS COBOL entry. This selects the editor template that matches UCOB – the ANSI COBOL-85 compiler on the OS 2200 system. Note that ACOB (ANSI COBOL-74) source can be used with the COBOL editor as there are only minor differences between the compilers regarding the language structure e.g. format of statements. For example, TALLY is an ACOB verb but not a UCOB verb so it will not be handled as a verb when the COBOL editor displays the source. Now expand the COBOL entry and click the Editor entry.



#### **COBOL General Preferences**

type filter text	Editor	$\Leftarrow \bullet \Rightarrow \bullet \bullet$
<ul> <li>General</li> <li>Ant</li> <li>C/C++</li> <li>COBOL</li> <li>Templates</li> <li>Data Management</li> <li>Fortran</li> <li>Help</li> <li>Install/Update</li> <li>Java</li> <li>Java EE</li> <li>Java Script</li> <li>Mylyn</li> <li>Plug-in Development</li> <li>Plus Preferences</li> <li>Remote Systems</li> <li>Run/Debug</li> <li>Server</li> <li>Team</li> <li>Terminal</li> <li>Usage Data Collector</li> <li>Validation</li> <li>Web</li> <li>Web</li> <li>XML</li> </ul>	COBOL Editor settings: General Colors Reference Format Text font: <using font="" text="" workbench=""> Show horizontal ruler Show print margin Print margin column: 6,7,72,80 Show overview ruler Show line numbers Highlight current line Highlight current line Use custom caret Finable thick caret Trim trailing spaces on Save Appearance color options: Line number foreground Current line highlight Print margin Selection foreground color Selection background color</using>	Color:
?		OK Cancel

The General tab is used to set various options on how the COBOL edit pane is prepared and handled. Modifying these settings affects only the current workspace, so each user can have their own preferences.

Preference	Description
Show horizontal ruler	Displays a horizontal rules in the edit pane
Show print margin	Puts vertical divider lines as the margins mentioned
Show overview ruler	
Show line numbers	Line numbers are displayed on the left edge of the edit window
Highlight current line	Highlights the current line for easier identification
Use custom caret	Cursor being used
Trim trailing spaces on	When a COBOL file is saved, Eclipse will trim trailing spaces from each
save	line

On the top of the General tab, Eclipse displays the current font. You can change the font by clicking on the Change button:



Editor	<b>(</b> -)	• => • •
COBOL Editor settings:		
General Colors Reference Format		
Text font: <using font="" text="" workbench=""></using>		hange

Eclipse allows you to set the font. This might be important when Character Conversion is used. For example, with Japanese it might be preferred to use the MS MINCHO or MS Gothic font. If you want to preserve columns etc then use a fixed font rather than proportional.

Font			<u>? ×</u>
Font: Courier New	Font style: Regular	Size: 10	ОК
O Curier New       ▲         O Curiz MT       ▲         T Dotum       ▲         T DotumChe       ●         O Edwardian Script ITC       ●         O Elephant       ●         O Engravers MT       ▼	Regular Italic Bold Bold Italic	10     ▲       11     12       14     16       18     20	Cancel
Effects Strikeout Underline Color: Black	Sample AaBb¥yZ Script: Western	Z	

## **COBOL Colors Preferences**

Click the Colors tab.





Note that Sections, Paragraphs and Working-Storage Variables do not have their colors set in realtime. From the COBOL editor, you must do a F4 to refresh the colors.

The Data Dictionary Variables is not available to all clients.

#### **COBOL Reference Format Preferences**

Click the Reference Format tab.



Preferences		<u>_     ×</u>
type filter text	Editor 🔶 🔹 🔿	-
<ul> <li>General</li> <li>Ant</li> <li>C/C++</li> <li>COBOL</li> <li>Editor</li> <li>Templates</li> <li>Data Management</li> <li>Fortran</li> <li>Help</li> <li>Install/Update</li> <li>Java</li> <li>Java EE</li> <li>Java Persistence</li> <li>JavaScript</li> <li>Mylyn</li> <li>Plug-in Development</li> <li>Plus Preferences</li> <li>Remote Systems</li> <li>Remote Systems</li> <li>Server</li> <li>Server</li> <li>Team</li> <li>Terminal</li> <li>Usage Data Collector</li> <li>Validation</li> <li>Web</li> <li>Web Services</li> <li>XML</li> </ul>	COBOL Editor settings: General Colors Reference Format Reserved word level: Unisys UCS COBOL Tab width Set Tab Columns: 7,8,12,16,20,73 Settings for AutoTag Tag in Columns 1-6 Default to Auto Tagging Restore Defaults Ar	pply
(?)	OK Car	ncel

#### **Configuring the Proxy Preferences**

Some sites use a proxy server to provide internet access. When this is configured on the workstation, Eclipse will get an error message when trying to connect a telnet session to the OS 2200 host.



The problem can be resolved by setting the Eclipse network settings to the correct value.

Go to **Window**  $\rightarrow$  **Preferences** and then expand General in the tree structure. Then highlight Network Connections. Set the Active Provider to Direct.

Refer to the figure below.



Preferences		_ 🗆 ×
type filter text	Network Connections	← → → ▼
General     Appearance     Build     Capabilities	Active Provider: Direct	
Compare/Patch Content Types  Conten	Schema       Host       Port       Provi       Auth       Use         HTTP       Manual       false       Image: second se	r Edit, Clear
Workspace     Ant     OC/C++     COBOL	Proxy bypass       Host     Provider       Iocalhost     Manual       127.0.0.1     Manual	Add Host Edit Remove
Fortran     F	Restore Defaults	s Apply
?	ОК	Cancel

#### Setting the OS 2200 Log Level

Eclipse writes a log file for the Unisys plug-ins to a file called **unisys-ca.log** into the selected workspace folder:



This log file could grow in size so the ability to set the log level was introduced. To set the log level, go to File  $\rightarrow$  OS2200  $\rightarrow$  Set Log Level:

## unisys

U 05 2200 - Eclipse		
File Edit Navigate Search Project Run	OS 2200 Window Help	
📬 ▾ 😭 🚔 📄 👘 🗎 💼   💦	<ul> <li>Add a Telnet Session bound to this project.</li> <li>Clear Problem List Markers</li> <li>Update OS 2200 Project</li> </ul>	
CD01-ROB	View Log Save Log Set Log Level	
CITACHGCTXT.ELT	Configure COBOL Procedures	*
GETPROC.COB	Configure Tag for Col 73-80	Ctrl+Shift+F5

The current log level setting is displayed.

U Set Log Level	×
<ul> <li>○ Fatal</li> <li>○ Error</li> <li>○ Warn</li> <li>○ Info</li> <li>● Debug</li> </ul>	
OK Cancel	

The user can choose the logging level to be logged. There are 5 different options arranged according to the priority.

• Fatal

This level will designate very severe error events that will presumably lead the application to abort. Logs only Fatal data.

• Error

This level will designate error events that might still allow the application to continue running. Logs Error and Fatal data.

• Warn

This level will designate potentially harmful situations. Logs Warn, Error and Fatal data.

• Info

This level will designate informational messages that highlight the progress of the application at coarse-grained level. Logs Info, Warn, Error and Fatal data.

• Debug

This level will designate fine-grained informational events that are most useful to debug. Logs everything (Info, Warn, Debug, Error and Fatal ).

Debug is the default setting.

If the Eclipse OS 2200 IDE encounters a problem or issue, the user can change the log level accordingly to gather more information to assist in analyzing the issue. Unisys may recommend clients to set the log level in response to reported problems. At present the log file has to be deleted or the contents of the log file has to be emptied to create a fresh log file. Note: the mechanism to clear the log automatically or to create another log after exceeding certain size does not currently exist but is being considered as an enhancement for a future release.



#### Log Level Help

Click on the question mark to launch the help. Then click on the 'Configuring the Logging Environment'.



Eclipse will display the online help information.



## **Configuring OS 2200 connections**

Eclipse uses two connection methods to the OS 2200 host:

- 1. Telnet is used to send commands to the host. You can open a demand session via telnet at any time.
- 2. CIFS is used to access the OS 2200 program file that contains the program source and other elements e.g. ECL. CIFS allows OS 2200 files to be exposed as network shares and then accessed from Windows using mapped drives.

There are two methods to define OS 2200 connections as explained below.

#### **OS2200 Host Manager View**

At the bottom of your Eclipse window, you should a number of tabs including the OS2200 Host Manager View:

## unisys



Click **Other** then scroll down to OS 2200 and expand the node.

Show View
type filter text
🗄 🗁 JavaServer Faces
🗄 🗁 JAX-WS
🗄 🗁 JPA
🗄 🕀 Make
🗄 🗁 Mylyn
📮 🔁 OS 2200
- TelnetView
🗄 🗁 Plug-in Development
🗄 🗁 Remote Systems
🗄 🕀 Server 📃
🗄 🕀 Team
主 🗁 Terminal 📃 💌
OK Cancel

Now click the OS2200 Host Manager View- CIFS entry.

In the OS2200 Host Manager View tab, right click. Eclipse will present a dialog:

🔂 Add Host
🚭 Delete Host
💱 Edit Host
💿 Connect Host
Disconnect Host
Properties
🕏 Refresh

#### Click Add Host

The Connection setting dialog appears with 2 tabs – one for Telnet and one for CIFS. As you fill in the Telnet tab, the CIFS tab is also populated with the same details.

Connections Settings			×
Telnet CIFS			
Host			
User ID			
Password			
Retype			
Save Password			
Operating System		-	
• OS 2200			
,			
Connection Name			
Port Number 23			
Character Conversion <pre></pre>			
Prompt Character			
SSL Port			
MHFS 🗌			
Host Prompt	Response		Record
			Add
			Remove
			Move Up
		r	Nove Down
			Edit
L			
	OK Cancel		

The Host field contains the DNS name or IP address for the OS 2200 host.



In the User ID field, enter your OS 2200 demand userid. Enter your demand password in the Password and Retype fields. Check the Save Password box. *Note: For Windows 7, your userid and password must be entered in upper case.* 

Enter a Connection Name.

The port number must be 23 for Telnet so don't change this value.

If your OS 2200 supports a language requiring character conversion e.g. Japanese, use the list box to select the entry otherwise leave as <NONE>.

Check the SSL Port box if using secure Telnet.

Check the MHFS box if your system uses Multi-Host File Sharing. This implies that your system runs XTC or PAEXEC.

The Record button can be used to record your normal responses to OS 2200 generated prompts when you sign-on to a demand session. For example, "Enter your project-identifier" might be a prompt. After clicking the record button, Eclipse will open a demand session via Telnet. Perform your usual steps and responses when using demand session.

Check the CIFS tab information and then click OK.

The following warning window appears when you finish the recording.



To edit the OS 2200 Connection, you can highlight the connection in the OS200 Host Manager View and right click. Then select Edit Host.

lost Marae	Connection Status	User-ID	- 05	Connection Name	
and the real sector of the real	Contracted	Jackson .	05 2200	R5168	
s race row uneys a CARD Host	Disconnected	janieson	05 2200	R902	
CD01 manus unis 🍲 Delete H0st	Corrected	janiéson,	05 2200	0001	
5, 10.121.0.23 🎲 6dit Heat	Deconnected	aeost	05 2200	90050	
A STATE OF S	1 20.00 L 100 -				
Chattaneout Host					
(G) Supporting					
and in the second					

At the right side of these tabs are some icons. When OS2200 Host Manager View is in focus, the following icons are displayed:



The second icon from the left can be used to add a new host. Hover text will display the function of the icon.

Or when using the Telnet Connection method below, highlight the Connection and then click Edit.

#### **Using the Telnet Connection method**

In the Icon menu, click the Telnet connection icon:



New Telnet Connection				
Select a telnet host				
Specify a host or select a preconfigured connection.				
	11.2			
C Manual (	• Configured			
Host: CD01.NA.UIS.UNISYS.C	:OM			
Port: 23				
Character Conversion <none></none>				
SSL Port				
CD01				
Host: CD01.NA.UIS.UNISYS.COM				
User ID: jamieson				
New	Edit Delete			
?	Finish Cancel			

Click New to display the Connection Settings window as shown earlier. Follow the above steps.

## Using the OS 2200 Perspective

Eclipse has different layouts for the IDE that are designed for the type of work being performed e.g. Java, Debug, and Java EE etc. After the Unisys Eclipse OS 2200 features have been installed (and at this stage they have), there is a perspective called OS 2200.

The perspective can be selected from the top right of the screen. In the following case, OS 2200 is greyed out as it is the default perspective that is open.

$\square$	EP 🖏	J Java	🏇 Debug	»
		+ 03	5 2200 V > FE	Ð
		Fo Da		1

You can also go to the menu and click **Window**  $\rightarrow$  **Open Perspective**  $\rightarrow$  **Other** 





#### Then select OS 2200

When the OS 2200 perspective is open, the IDE should look like:





Preferences		_ 🗆 🗵
type filter text	Perspectives	← → → →
General     General	Open a new perspective	
Startun and Shutdown	Available perspectives:	
<ul> <li>Web Browser</li> <li>Workspace</li> <li>Ant</li> <li>C/C++</li> <li>COBOL</li> <li>Data Management</li> <li>Fortran</li> <li>Help</li> <li>Halp</li> <li>Install/Update</li> <li>Java</li> <li>Java EE</li> <li>Java Persistence</li> </ul>	Image: C/C++         Image: CVS Repository Exploring         Image: CVS Repository Exploring         Image: CVS Repository Exploring         Image: Database Debug         Image: Database Development         Image: Database Development <td>Make Default Revert Delete</td>	Make Default Revert Delete
Java Persistence     JavaScript     JavaScript     Plug-in Development     Plus Preferences     Remote Systems     Run/Debug     Server     Team     Terminal     Usage Data Collector     Validation	<ul> <li>Solution per sector per sector</li></ul>	
⊞ Web ⊞ Web Services ⊞ XML	Note: 'Revert' removes the customization from the selected perspectives. This only applies to newly opened perspectives. Restore Default	stive.
?	OK	Cancel

#### Using the OS 2200 Telnet Connection

Now that Eclipse has been configured with OS 2200 connections, we can use the Telnet connection to run a demand session. Note that Telnet only supports a line-at-a-time session so full screen modes like IPF full screen mode, UDSMON etc will not work. However the Telnet connection can be used to submit ECL statements etc.

Look at the icon on the tool bar that looks like a set of dumbbells:





Click on this icon 🔭 to launch the Telnet session.

Eclipse will present the following screen to show the configured connections plus allow you to enter a manual connection.

💓 New Telne	t Connection			
Select a tel	net host			
Specify a hos	t or select a preconfig	jured connectio	n.	0-0
	O Manual	•	Configured	
Host;	CD01.NA.	UIS.UNISYS.CO	M	
Port;	23			
Character Co	nversion </td <td><b>v</b></td> <td></td> <td></td>	<b>v</b>		
SSL Port				
Connections				
Host:	CD01.NA.UIS.UNISY	S.COM		
User ID:	jamieson			
New			[	Edit Delete
?			Finish	Cancel

Select the connection defined earlier and click Finish. (Don't click New as that will launch the dialog to define a new connection.) Eclipse will open a new window pane for the connection and automatically start a demand session using the defined userid/password.

🖉 Tasks 🖹 Problems 🔷 OS 2200 End Summary View 🕕 Memory 👭 Registers 🗖 Eclipse 2200 Log 😕 OS2200 Host Manager View - CIFS 🗪 CDQ	1 🛛				
Enter your user-id/password:					
>					
*UNISYS 1100 Operating System Level 48R6.4AACDO1(RSI)*					
***************************************					
Welcome to the CD01 Cloud OS2200 Road Show system!					
System Administrator: Dan Sonmore N524-7627					
***************************************					
Current session number: 209					
Previous session was: THU 26 JAN 2012 06:12:27 CST					
DUP ID, NEW ID IS JAMIET					
DATE: 2012-01-26 TIME: 06:27:57 CST					
>DATA IGNORED - IN CONTROL MODE					
>					

Commands are submitted as if you are using a demand session such as via a terminal emulator except that full screen mode is not supported. The session can be closed by clicking on the "X" in the tab.



If you want to save the contents of the Telnet pane, there is the following icon on the right side of the pane title bar:

#### Preparing Your OS 2200 Program File

Your OS 2200 program file that contains the program source code needs to be shared with CIFS so Eclipse can access the file. This is accomplished by creating a share using the CIFSUT processor in an OS 2200 demand session.

```
@CIFSUT
share /os2200/<qual>/<filename> <sharename>
```

In the following example, the OS 2200 program file is dorado\*rob. The commands are:

```
@CIFSUT
share /os2200/dorado/rob doradorob
```

In this example, a Windows network drive could be mapped to <u>\\<server>\doradorob</u>.

To unshare the program file, enter the commands:

@CIFSUT unshare doradorob

However it can be easier than this. A default share called "os2200" is recommended to be created over the OS 2200 MFD and we will use this share for the examples. This means that you don't have to define your own shares.

More details on CIFS can be found in the CIFS manual.

#### Creating an OS 2200 Project

Now that a CIFS share has been created for the OS 2200 program file to be used for OS 2200 3GL development, Eclipse can be used to define the OS 2200 project. From the Eclipse workbench and in the OS 2200 perspective, go to the menu bar and do **File**  $\rightarrow$  **New**  $\rightarrow$  **OS 2200 Project** and click.

U U	5 220	IU - Eclipse	2					
File	Edit	Navigate	Search	Project	Run	OS 2200	Window	Help
	New	1				Alt+	Shift+N	🕨 🛃 OS 2200 Project
	- 4							

Alternate Option: Right click in the OS 2200 Explorer View and choose New → OS 2200 Project.



The following Window appears:



U New OS 2200 Project	
Create new OS 2200 Project The project name cannot be empty.	
OS 2200 Project Name	
OS 2200 Connection Name Host Name, User ID:	CD01 CD01.na.uis.unisys.com, jamieson New Edit Delete
Use standard OS 2200 Share (os22     Use a non-standard name for os22     Custom Share Name	200). :00 share.
Create New Work File OS 2200 Work File STD# OS HARED# Qual*File(Cycle).	
Use if OS 2200 workfile has a unique     Enter share of workfile on OS 2200,	Je share.
?	< Back Next > Finish Cancel

Enter a name for your project in the field "OS 2200 Project Name".

Select the OS 2200 Connection to be used.

Check the radio button called "Use standard OS2200 Share (os2200)" if your site is using the os2200 share in CIFS. However if your site has used a different name for the share, then check the "Use a non-standard name for os2200 share" and enter the share name in the Custom Share Name field. Both of these options provide access to the entire OS 2200 MFD directory. However you may have a share defined over a single OS 2200 file. For example:

```
@CIFSUT
share /os2200/unisys/rob robj
```

would create a share called 'robj' over file unisys\*rob. In this case, check the 'os2200 share cannot be used'' radio button.

If using MHFS, refer to the MHFS Considerations section later in this document. Now click **Next**. UNISYS

The Eclipse wizard displays a screen for the build runstreams and breakpoint files to be used as shown below. If Eclipse can't access the OS 2200 Work File, an error will be presented. Check the Unisys-CA log (access via the menu option **OS2200**->**View Log** if additional information on the cause of the error is needed.

New OS 2200 Project	
Set the build runstream and breakpoint files list for this project Enter the ECL commands that will build this project into the Build Stream tab and add the cataloged breakpoint files containing compiler listings to the list in the Brkpt Files tab.	
Build Stream Brkpt Files	
©. Enter your OS 2200 Build Stream here.	
Sack Next > Finish	Cancel

Click the "Brkpt Files" tab.



🔅 New OS 2200 Project			
Set the build runstream and breakpoint file: Enter the ECL commands that will build this project into th containing compiler listings to the list in the Brkpt Files tat	<b>s list for this project</b> ne Build Stream tab and add ti o.	he cataloged breakpoint files	
Build Stream Brkpt Files			1
Single Share for all Brkpts			
OS2200 Breakpoint Filename			
View name (optional)	I CIFS Name		
Add Replace Remove Move Up Move Dow	in		
<u> </u>			
?	< Back	Next > Finish	Cancel

We will return to define these later.

Click 'Next'. It may take Eclipse a little time to access the OS 2200 program file and retrieve the names of all the source elements in the file. (ABS, REL, OM, ZM elements are not returned.) For this example using UNISYS\*ROB, the following screen was returned.



U New OS 2200 Project	
Add elements Add program file elements to your OS 2200 project. Workfile: UNISYS*ROB.	
Work File Contents Element Search Element (Include ?,* and % as Wildchars) 47292107-004/PDF BEIJING CITACHG/TXT CITACHGBTXT CITACHGBTXT CITACHGBTXT CITACHGCTXT DEFMAS/COPY E-TEST FILES1R1/SG5 GETB8A GETB8A/COMP GETPROC HD JB JBTEST KEYIN-EX LEVEL/C MLFTN MLFTN/COMP NEWBATCH NEWDPS PROCELT PROCELT/130130 PRODLD/CITA	Project Contents Link Search Element (Include ?,* and % as Wildchars)
Add Element attributes.	Change element attributes.
?	< Back Next > Finish Cancel

The left pane shows the OS 2200 source elements in OS 2200 format. (The only difference is for elements which were created by dragging a non-2200 file via CIFS to the work file. CIFS maintains the Posix format for these elements but the 2200 TOC will be in standard 2200 format.)

Now highlight the elements that you want to be part of this project. You can use standard Windows selection methods to choose multiple elements. Note that after you have selected at least 1 element, the ">" arrow is displayed and the drop-down boxes for 'Editor' & 'Character Conversion' are enabled. The user may change the type (extension) for the selected elements from 'Editor' drop-down.

Use the Search Element text box to filter the elements you want to display by entering the starting characters of the element name. Wildcard searches using '\*' for any number of characters and '?' for a single character. For example, using '?':



Search Element (Include ?,\* and % as Wildchars)

C?T

CITACHG/TXT CITACHGBTXT CITACHGCTXT

Note all elements are set to same type and/or character conversion.

Click this arrow icon to add the selected files to your Eclipse project.

Note: Without selecting any elements, the user can create a project. Later, the user can either update the workfile or create a new element. This can be done by clicking 'Finish' from any of the screens in 'New OS 2200 Project' wizard, provided the project-details (Name, workfile & connection) have been furnished correctly on the first-screen.


Work File Contents Element Search Element (Include ?,* and % as Wildchars)	Project Contents Link Search Element (Include ?,* and % as Wildchars)
47292107-004/PDF BEIJING CITACHGBTXT CITACHGBTXT CITACHGCTXT DEFMAS/COPY E-TEST FILES1R1/SGS GETPROC HD JB JBTEST KEYIN-EX LEVEL/C MLFTN MLFTN/COMP NEWBATCH NEWDPS PROCELT PROCELT/130130 PRODLD/CITA PRODLD/FILES1R1 PROG1 PROG1 PROG1/COMP	CITACHG-TXT DEFMAS GETB8A GETB8A-COMP
Add Element attributes.  Editor <default> Character Conversion  <none></none></default>	Change element attributes.  Editor  Change Character Conversion  NONE>

The selected elements are moved from the left pane to the right pane. At this stage also, we can define the type of element. For example, for any COBOL source programs, highlight the element and select 'COB' from the Editor list box and then click 'Change'. Change any elements containing ECL etc to ELT editor type. Changing the type ensures that the element is opened in the desired editor, i.e. a COB element would open in the COBOL-editor and an ELT element would open in the general Text-editor.

Project Contents Link
Search Element (Include ?,* and % as Wildchars)
CITACHG-TXT
DEFMAS
GETB8A.COB
IGETB8A-COMP.COB (Japanese(LetsJ))

Note the Character Conversion should be set correctly if your OS 2200 supports a different language like Japanese.

Note: Even before moving elements from right pane to left pane, a user can change the element type. The user has to select file(s) and choose what type of element he wants from the drop down under "Add Element attributes" and then move to left pane

Click 'Finish'.



Eclipse opens your project in the OS 2200 Explorer View



#### Automatic Open of a Single File

If a single source element is added to a project, Eclipse will automatically open the element with the appropriate editor.

#### **MHFS Considerations**

When a new OS 2200 Host is defined, there is a check box to indicate if the host uses MHFS:

Port Number	23
Character Conversion	<none></none>
Prompt Character	>
SSL Port	
MHES	

Eclipse does verify if the system is configured for MHFS. The incorrect setting for this option could lead to unexpected errors during other operations.

Select STD# for files stored on local discs or SHARED# for files on shared storage. Note that the same file name could exist in both STD# and SHARED#. Eclipse uses this setting to access to desired file.

#### Creating a new OS 2200 Work File.

When running the Create New OS 2200 Project wizard, an existing OS 2200 work file can be entered. However Eclipse has the option to create the OS 2200 work file. After entering the project name and connection, click on the Create New Work File button.



The next dialog allows you to enter the OS 2200 Work File name:

# unisys

🚺 Create New '	Work File	×
WorkFile Name:		
For sites that ru	IN MHES	
STD#	C SHARED#	
Access		
• PUBLIC • O	PRIVATE	
Type(Addressal	ble)	
● SECTOR ○	WORD	
Initial Reserve:	0	
Granule		
● TRK ○ PC	S	
Max Length:	256	
Pack-ID:		
ACR-Name:		
?	OK OK	Iancel

Enter the parameters as desired:

# unisys

U Create New Work File 🔀			
WorkFile Name:	XXXX*ROB		
For sites that run	MHFS		
STD# C	SHARED#		
Access			
• PUBLIC •	PRIVATE		
Type(Addressab	le)		
● SECTOR ○	WORD		
Initial Reserve:	100		
Granule			
I € TRK C POS	5		
Max Length:	1000		
Pack-ID:	REM001		
ACR-Name:			
Composed entry:			
@CAT,P XXXX*R0	DB.,F/100/TRK/1000,REM001		

The 'Composed entry:' field can be further edited. Click OK.

After cataloguing the file on the 2200, Eclipse fills in the Work File name and then you proceed with the wizard as explained above.



# Deleting an OS 2200 Project

Right click on the project and select Delete. Eclipse displays the following dialog.

🔆 Confirm Project Delete	×
Are you sure you want to delete project 'XXXX'?	
Also delete contents under 'C:\Eclipse3-7 Workspace\XXXX'	
O not delete contents	
Yes No	

This operation does not delete the OS 2200 work file.

# Maintaining your OS 2200 Project

The wizard is used to define the initial project properties but these can be maintained later. In a later section there is an explanation of how to maintain the Build and Brkpt properties.

To maintain the existing project properties, right-click on the project name and then select OS 2200 and then Update OS 2200 Project as shown below.



Or click the *icon*:

😈 05 2200 - Eclipse	
File Edit Navigate Search Project	Run OS 2200 Window Help
] 📑 🔹 🖹 🖴 🗐 🕼 📥 🗎 🖬	🚜 😰 🖪 🛃   🏎   🏇 • 🕥 • 💁 •   😂 🔗
OS 2200 Explorer 🕺	Update project contents from OS 2200 work file

This launches a wizard that is similar to the new project wizard.

# unisys

U Updating OS 2200 Project	
Add or remove elements Add program file elements to your OS 2200 project Workfile: Unisys*rob.	
Work File Contents   Element   (Include ?,* and % as Wildchars)     47292107-004/PDF   BEIJING   DEFMAS/COPY   E-TEST   FILES1R1/SGS   HD   JB   KEYIN-EX   LEVEL/C   NEWBATCH   PROCELT   PROCELT/130130   PRODLD/CITA   PRODLD/CITA   PROS1/COMP   ROB   SCRIPT/SQL   TEST   Add Element attributes.   Editor   Icdefault > Image: Conversion   IcNONE > Image: Conversion	Project Contents Link Search Element (Include ?,* and % as Wildchars) CITACHG-TXT.ELT CITACHGBTXT.ELT CITACHGGTXT.ELT DEFMAS.COB GETB8A-COMP.TXT GETPROC.COB JBTEST.COB MLFTN.FOR MLFTN.FOR MLFTN.COMP.TXT NEWDPS.COB PROG1.COB SOCSO-PR.ELT Change element attributes. Editor character Conversion cNONE>
?	Finish Cancel

Note the Search text boxes can be used to filter the contents of either pane. Use '\*' and '?' as wildcard characters.

Note to change the editor for a file, you must highlight the file, select the required editor and click Change. The available editors are:



Editor	
<default></default>	•
<default></default>	
ELT	
COB	
C	
н	
JAVA	
FOR	
ASM	
MSM	ł
PLS	

#### Adding a new OS 2200 Element to a Project

You can add a new element to your OS 2200 program file by creating an element in your Eclipse OS 2200 project. For example, you may want to write a new COBOL program. In the Explorer tree, right-click on the project name and then select OS 2200  $\rightarrow$  New OS 2200 Element.



An alternate option is to use the menu File  $\rightarrow$  New  $\rightarrow$  OS 2200 Element.

ÖO	💮 OS 2200 - Test/GETB8A.COB - Eclipse								
File	Edit	Navigate	Search	Project	Run	OS2200	Windo	w	Help
	New					Alt+Sł	nift+N	►	🥂 OS 2200 Project
	Оре	n External f	File With .						Project
	Ope	n File							
	Clos	e				Ctrl+V	v		OS 2200 Element
	2100	-							

Yet another option is to right click the OS 2200 Work File in the Explorer View and select New  $\rightarrow$  OS 2200 Element.



🖃 😥 Test	_	98	MOVE "****"	
🖹 🗁 🔁 unisye**	New	. 991 - 11	STRING "ERR-STA " ER	ROR-STA'
G G	Remove from Context	Ctrl+Alt+Shift	t+Down	
	Сору		OS 2200 Element	

Yet another method is to click the *icon* in the Icon menu bar.

Eclipse will respond with the following wizard:

😈 New OS 2200 Element		
Create a new element Create a new element in you	: ur OS 2200 project and work file	
OS 2200 Work File: Element Name Project entry: Select symbolic subtype: Select Character Conversion	Unisys*rob.	
?	Fin	ish Cancel

Enter your OS 2200 element name and select the symbolic subtype (choose COB for COBOL). If Character Conversion is required, please select the appropriate language otherwise leave as <NONE>. Note that the element name must comply with standard OS 2200 file naming conventions for syntax and characters etc. Using element/version is valid. Note the status message displayed in the window.

[	U New OS 2200 Element		U New OS 2200 Element				
	Create a new element 8 Element name already exists in work file.			Create a new element (3) Illegal OS 2200 element name			
	OS 2200 Work File: Element Name Project entry:	Unisys*rob. DEFMAS DEFMAS		OS 2200 Work File: Element Name Project entry:	Unisys*rob. MY# MY#		

After entering a valid element name, click **Finish**.

A new editor pane will be opened to allow the data entry of the source. Note the editor is based on the symbolic subtype that was used when creating the element.





Note that the navigation tree has been updated as well.

### **Deleting OS 2200 Elements from your Project**

Right click on the file in the project and select **Delete**. Eclipse displays a dialog to control the actions to be performed. Select the appropriate option and click Yes.

U Confirm Resource Delete	×				
Are you sure you want to delete the linked resource, CITACHGCtxt?					
O not delete the element in OS 2200 work file					
Delete the element in the OS 2200 work file: Unisys*rob.					
$\odot$ Delete the element and all its versions in the OS 2200 work file: Unisys*rob.					
Yes No					

## Renaming or Changing the Type of OS 2200 Elements

Right click on the file in the project and select **Rename/Type Modification**.



Eclipse displays a dialog where you enter the new element name, symbolic subtype and character conversion language. Click Finish to action.



T Rename/Type modification						
Rename/Type modification Rename/Modify-Type for element in your OS 2200 work file.						
OS 2200 Work File:       Unisys*rob.         Element Name       CITACHGCTXT         Project entry:       CITACHGCTXT.ELT         Select symbolic subtype:       ELT         Select Character Conversion: <none></none>						
Finish	Cancel					

# **Moving OS 2200 Elements**

A file in one project can be moved to another project. Right click on the file in the project and select **Move**.



<b>T</b> Folder Selection		
Select the destination:		
CD01-Rob		
<ul> <li></li></ul>		
?	ОК	ancel

Eclipse will try to move the element to the new project. If the element already exists in the destination OS 2200 work file, the following dialog is displayed.

💮 Name Conflict	×
Enter a new name for 'MLFTN'	
MLETN	
You must use a different name For OS2200 element/version, use element.version	
OK	

After the move, the destination project is updated with the new element. (Note I used MLFTN3 to overcome the name conflict.)





🖃 😥 Newrob						
🖻 🗁 new*rob.						
📴 026039-txt.COB						
📴 026059-txt.COB						
🙀 GETB8B.COB						
🕞 MLFTN3.FOR						
🙀 O26039.COB						
📄 rob.ELT						
🔤 🔚 📄 🔜						
🖻 😥 Rob						
🗄 🗁 unisys*rob.						
🖻 😥 Rob2						
🗄 🗁 Unisys*rob.						
🖻 😥 Test						
🖻 🧀 unisys*rob.						
E-TEST.ELT						
🕞 GETB8A-comp.ELT						
🔤 😪 GETB8A.COB						
🖹 MLFTN-COMP.ELT						
····· 🔂 MLFTN.FOR						
🔤 💼 files1r1-sgs.ELT						
🗄 🗁 testmlj						

#### **Copying OS 2200 Elements**

Right click on a project file and select Copy.

Highlight the destination project, right click and select Paste.

Eclipse will copy the file to the new project. If the element already exists in the OS 2200 work file, the following dialog appears.

💮 Name Conflict	×
Enter a new name for 'E-TEST'	
31551	
You must use a different name For OS2200 element/version, use element.version	
OK	

# **Using the Explorer View**

The Explorer View lists the OS 2200 Projects defined in this workspace. If you expand the node, the next level shows the OS 2200 work file name. If you expand this node, you will see the source elements that comprise the files in your project.





The project type is indicated by the icon next to the project name. Note the difference between testmlj and the other projects above – all are OS 2200 projects except for testmlj.

Note if the source element has a version, the version is appended to the element name after a hyphen. For example, element MLFTN/COMP becomes file MLFTN-COMP.ELT. The extension on the file is important as it determine what Eclipse editor is used. COB will launch the COBOL editor, FOR will launch the Photran editor (Eclipse Fortran editor). ELT will launch the generic editor. The editor to be used is displayed in the icon next to each file. Note that Eclipse will try to determine the editor to use if the extension is TXT.

# **Supporting Multiple Projects**

Follow the procedures above to add more projects. The projects are added to the navigation tree and sorted in project name order.



Note that the same OS 2200 Work file can be used in many different projects.

# Using the OS 2200 Project

This section will cover how to edit and build (compile) your project using Eclipse. The following screen shows the OS 2200 Project perspective. This section focuses on using the COBOL editor. Later sections discuss other editors like the Fortran editor and Generic editor.





Note that the project name is the root of the explorer tree and the OS 2200 program file is shown but only those selected elements as project files are listed.

# **Editing and Saving**

Now double click on an element that represents a COBOL program. In the project navigation tree, the file will have an extension of COB. In this example, GETB8A.COB is selected.



Eclipse will retrieve the source from the OS 2200 work file and open using the COBOL editor.



Eclipse has now displayed the contents of the element in a separate tab in the editor window. Since we had identified this element as a COBOL program, the editor uses the UCS COBOL template to highlight the code in different colours for reserved words, statements, comments and user variables. These were the COBOL preferences that we configured earlier.

One of the advantages of using Eclipse is that multiple files (OS 2200 elements) can be open at any time. These could be from one project or multiple projects. You can double click a file in the navigation tree to open or right click the file name and then select **Open**. Eclipse will open a new pane for each file as it is opened as shown below.



Therefore you could have multiple files representing different COBOL programs open at the same time. It is a simple matter to click on the appropriate tab to change the focus to the required source for that file. Code can be copy-pasted between panes – even if the files are in different projects.

Note that after you edit the source code, an '\*' appears before the element name in the tab. See below for an example.

## 📧 \*GETB8A.COB 🔀

These edits have only been made to the version of the file (element) stored on the workstation and not on the OS 2200 host. When you save the element, the updates are applied to the element in the OS 2200 program file. Eclipse will also maintain a local history of saved versions that will be discussed later.

Note that Eclipse does no syntax checking or compiling. The editor template provides assistance to improve your productivity. We will discuss some of the editor features later. Incorrect syntax will be reported after the program is complied on the OS 2200 host when you build the project.

## **Opening an Element in Read-Only Mode**

By default, Eclipse will open elements in update mode. If you want to open an element in read-only mode, right click on the element in the Explorer View and select Properties. (You can also use File -> Properties.) Check the 'Read only' attribute.



U Properties for JBTEST.COB		_ 🗆 🗙
type filter text	Resource	$\leftarrow \star \Rightarrow \star \bullet$
Resource 	Path:       /CD01-Rob/JBTEST.COB         Type:       Linked File         Location:       \\CD01.na.uis.unisys.com\os2200\unisys\rob\JBTEST         Resolved location:       \\CD01.na.uis.unisys.com\os2200\unisys\rob\JBTEST         Size:       66 bytes         Last modified:       May 14, 2013 8:59:24 PM         Attributes:       Image: Read only         Archive       Image: Derived         Text file encoding       Image: Other: Cp1252)         Other:       Cp1252         May       State S	Edit
?	ОК	Cancel
f the user tries to update th	ne element, the following prompt is received.	



U Read-only File Encountered	×
File '/CD01-Rob/JBTEST.COB' is read-only. Do you wish to make it writable?	
<u><u>Y</u>es <u>N</u>o</u>	

The user can decide whether they want to proceed and change the element so it can be updated.

#### Using the Save option

To save an element, you can

- a) click the diskette icon in the tool bar,
- b) right-click in the editor pane and select 'Save' or
- c) use File  $\rightarrow$  Save.

Eclipse uses CIFS to update the OS 2200 program file element. The following example shows using the diskette icon: Clicking the single diskette icon will save the current program. Clicking the multiple diskette icon with save all updated elements.



The next example using right-click in the editor pane appears in the next screen snapshot:

Open Declaration	
Undo	Ctrl+Z
Revert File	
Save	Ctrl+S
Open With	+
Show In	Alt+Shift+W
Cut	Ctrl+X
Сору	Ctrl+C
Paste	Ctrl+V
Run As	•
Debug As	•
Profile As	•
Validate	
Team	•
Compare With	•
Replace With	•
Preferences	
Toggle Update Tag	
Build Configurations	•
Remove from Context	Ctrl+Alt+Shift+Down

Finally you can use **File**  $\rightarrow$  **Save**.

😈 OS 2200 - CD01-Rob/DEFMAS.COB - Eclipse										
File	Edit	Navigate	Search	Project	Run	OS 2200	Window	He		
	New	ļ.				Alt+	-Shift+N	×		
	∲New	Text File								
- 1	Оре	n File From	Configure	ed Server						
	Ope	n External F	File With .							
Ľ	Crea	ate New Elei	ment							
	Оре	n File								
	Clos	e				Ctrl-	+₩			
	Clos	e All				Ctrl-	+Shift+W			
l.	Save Ctrl+S									
	Save As •									
6	Savi	e All				Ctrl-	+Shift+S			

# Using the Save-As option

Eclipse provides the ability to use a Save-As function with 3 options:

- 1. Save to the Workspace
- 2. Save to Local Disk
- 3. Save to a Configured Server

Go to File -> Save As...



U O	U OS 2200 - CD01-Rob/DEFMAS.COB - Eclipse									
File	Edit	Navigate	Search	Project	Run	OS 2200	Window	He	elp	
	New New Ope Ope Crea Ope	v v Text File en File From Configured Server en External File With ate New Element en File			Alt+Shift+N ►		•	☆ • • • • • • • • • • • • • • • • • • •		
	Clos Clos	e e All				Ctrl- Ctrl-	+W +Shift+W		IDENTIFICATION DIVIS PROGRAM-ID. DEFM	
li i	Save Save	9 9 Ac				Ctri-	+5		Save To Workspace	
Q	Save Save Rev	e All ert				Ctrl	+Shift+S		Save To Local Disk Save to Configured Server	

# Save To Workspace

This option allows you to save the source file to a project defined in your workspace. For OS 2200 Projects, it does not save the source to the associated 2200 work file. Highlight the destination project, change the file name if required and then click OK.

U Save As	
Save As Save file to another location.	
Enter or select the parent folder:	
CD01-Rob	
<ul> <li>Image: CD01-Rob</li> <li>Image: CD01-slr</li> <li>Image: CD01-slr</li> <li>Image: RemoteSystemsTempFiles</li> <li>Image: RS16B-RUN</li> </ul>	
File name: DEFMAS.COB	
?	OK Cancel



## Save To Local Disk

Use this option to save the source file to any folder accessible by your workstation. You can browse to select the drive from the "Save in:" text box. The File name and file type can also be changed if required. Then click OK.

Save As		? ×
Save in:	🖙 Local Disk (C:) 💽 🕥 🦻 📴 🖽 🗸	
My Recent Documents Desktop	<ul> <li>_EOMPDF</li> <li>_My Monitored Directory</li> <li>_WebPostingPDF</li> <li>AB Suite 2.0</li> <li>ABS_CE</li> <li>Apache FO</li> <li>b2c6950594f08fe951db25</li> <li>cmdcons</li> <li>CSVDir</li> </ul>	Documer Drivers Carbonins
My Documents	Custom Custom Database Drivers DEFdatasource Demo Demo MonitorDirectory Demo-MonitorDirectory	eclipse-2 eclipse-2 eclipse-2 eclipse-2 eclipse-2 eclipse-2 Eclipse 3
My Network Places	File name:     DEFMAS         Save as type:     *.*	Save Cancel

# Save To Configured Server

This option will save the file to the selected OS 2200 host. The available OS 2200 hosts are based on the host connections defined for this workspace.



U Save to Configured	Server				×
Host	CD01	<b>•</b>			
Qualifier	File	Element			
	*				
11					
<u>a</u>					
	BP\$CP12.1	CMS1100	🔁 DAN	🔁 DPS	🔁 ESP
⇒ \$\$CIPHER\$\$	BR BR		DARNOWSKY		
➢ \$\$SIMAN\$\$	BRCLEAN	E CONSOL	🗁 DDN	🗁 DTP	E FKONSL
🗁 8EJG	🗁 BUFFER	🗁 CONTRIB3	🗁 DDP	DTP-EPORTAL	🗁 GSISRINIVO
🗁 AJD	🗁 CALDARALE	🗁 CP131	🗁 DDP \$DUMP	🗁 E	🗁 I18N
🗁 APP3SETUP	🗁 CD01	🗁 СРСОММ	🗁 DDP-FJT	ECLIPSE2200	🗁 IC\$
🗁 ASIS	🗁 CIFS	🗁 CPCOMM\$A	🗁 DDP-PPC	🗁 EFR	🗁 IC\$JPJVM
🗁 B	🗁 CIPHER	🗁 CPCOMMOS	🗁 DDP-TXFR	🗁 EFRA	🗁 IC2200
🗁 BAW	🗁 CITA	🗁 CPFTP	🗁 DEF-TEST	🗁 EJG	🗁 IPF
🗁 BP\$CP11-3	🗁 CITA \$A	🗁 CSF	🗁 DEMOUSER	🗁 EPORTAL	🗁 IRU\$
🗁 BP\$CP12-0	🗁 CMR	🗁 CSF-UXFR	🗁 DGT	🗁 EPTRANS	🗁 JBOSS
•					•
0				Savo	Cancel
0					

The format of the qualifier, filename and element are validated. The element can also have a version e.g. elt/ver.



U	Save to Configured S	erv	er						x
		_							
	Host	CI	001						
	Qualifier		File	Element					
	UNISYS	*	ROB .	DEFMAS					
									-
	<b>=</b>								
									-
	DEFMAS								1
									J
	?					Save	1	Cancel	
	Ū				_				

If the destination file or element exists, Eclipse will report this:

😈 File already Exists		×
Overwrite existing file: UNISYS*ROB.DEFMAS		
	Yes No	

If you try to "Save As" to an element, the OS 220 work file must exist. You can save to a new file in which case Eclipse creates the file as private on fixed with default options.

```
@prt,f unisys*rob2.
FURPUR 32R5B (110805 0929:33) 2013 Jun 23 Sun 1031:46
 * * PROJ: RJJ
                            ACCNT: 0
                                                 * *
UNISYS*ROB2(1), F/0/TRK/262143
MODES: PRIVATE
NO. OF GRANULES ASG-D:
                           14
                                   GP2=14
HIGHEST GRANULE ASG-D:
                           13
                                                           0
                                   TOTAL ASSIGNMENTS:
HIGHEST TRACK WRITTEN:
                           13
CAT: 06/23/13 AT 10:30:42, LAST REF: 06/23/13 AT 10:31:10
```

#### Searching Files, Projects and Workspaces

Eclipse provides an inbuilt searching capability that works on files, projects and workspaces. It does not work on data files or OFCS opened elements.

Go to the **Menu -> Search** 



😈 05 2200 - Eclipse				
File Edit Navigate	Search	Project	Run	OS 2
📷 - 😭 🖻 🖫	🔗 Sear	rch	Ctrl+	н
	🛒 File.			

Select either Search or File. File is probably the most likely used option for OS 2200 Projects. In the Search wizard, enter the search string and then set the Scope.

U Search	
😵 Remote Search 🐶 File Search 🔗 C/C++ Search 👂 Fortran Search	
Containing text:	
display	Case sensitive
(* = any string, ? = any character, $\ \ = escape$ for literals: * ? $\ \ \ )$	Regular expression
File name patterns:	
*	Choose
Patterns are separated by a comma (* = any string, ? = any character)	
_ Scope	
○ Workspace   Selected resources   C Enclosing projects	
C Working set:	Choose
Customize	Replace Search Cancel

The Scope option limits the search. "Workspace" searches all projects in the workspace. "Selected resources" just searches the projects or elements highlighted in the Explorer View. Only elements in the Project are searched. Eclipse shows a progress dialog.

Tile Search	l
Searching for pattern 'display'	
Scanning file 26 of 141: runner.TXT	
Always run in background	
Run in Background     Cancel     Details >>	
The results are returned in a Search View:	
🗏 OS 2200 Host Manager View - CIFS 🤕 Tasks 🔝 Problems 🔗 Search 🙁	



The results can be expanded to show the element and line number. Double click the line number to open the element in the editor and position the cursor on the line:



```
🖻 PROG1.COB 🔀
    ----+----1----+----2----+----3----+----4----+-
           IDENTIFICATION DIVISION.
  1
  2
           PROGRAM-TD.
                           PROG1.
  3
           AUTHOR.
                           Unisys - Rob Jamieson.
  4
           DATE-WRITTEN. January 2012.
  5
  6
           ENVIRONMENT DIVISION.
  7
           CONFIGURATION SECTION.
  8
           SOURCE-COMPUTER. UNIVAC-1100-70.
  9
           OBJECT-COMPUTER. UNIVAC-1100-70.
           SPECIAL-NAMES.
 10 UCOB
               CARD-READER IS CARD-READER
 11 UCOB
 12 UCOB
               PRINTER IS PRINTER
 13 UCOB
               CONSOLE IS CONSOLE.
 14
           INPUT-OUTPUT SECTION.
 15
           DATA DIVISION.
 16
           WORKING-STORAGE SECTION.
           01
              WS-NAME
 17
                                      PIC X(30).
 18
           b1.
               WS-AGE
                                      PIC 99.
 19
 20
 21
           PROCEDURE DIVISION.
 22
           OPEN-PARA.
 23
               MOVE "Robert" TO US-NAME.
 24
               MOVE 52 TO US-AGE.
$25
               DISPLAY "Name: " WS-NAME.
$26
               DISPLAY "Age:
                               " WS-AGE.
27
```

Notice the Icon 🚔 next to all lines that matched the search.

Note that data files or elements opened with OFCS can't use the Search option as the file/element is not included in an OS 2200 project. You would need to add the file/element to a project to use the search feature.

#### **COBOL Content Assistant and Auto Completion**

The Editor template also provides for content assistance and auto-completion to assist the programmer. For example, a programmer is developing a new program and cannot remember the format of certain COBOL structures and statements. The programmer can hit 'Ctrl-Space' or select Edit  $\rightarrow$  Content Assistant from the menu bar. Eclipse will display a pop-up with the COBOL statements as shown below. The statements are limited to the COBOL division that you are working in.



The programmer can then scroll thru the list to find the required statement. Hitting 'Enter' will result in Eclipse putting a template of the statement in the program source where the cursor was positioned.

If the programmer knows the first character/s of the verb but not the rest of the statement, then they can use auto-completion via the content assistant to help. For example, if you enter 'STR' as the first characters on a new line and then invoke the content assistant (Ctrl-Space), Eclipse will show a pop-up with only those COBOL statements that begin with 'STR'.

109		INTO GLB-REASON.		
110	STR			
111	EXI	STRING statement - STRING statement	STRING Identifier1 DELIMITED BY Identifier2	
112	*			
113	FETCH-E		*> ON OVERFLOW	
114	* MO		*> Statement	
•			*> NOT ON OVERFLOW *> statement	
🔋 Tasks 🔝 F	Problems 🌘 🤇		*>END-STRING	21
lost Name				
🛃 CD01.NA.U	IS.UNISYS.CO			-

By transmitting 'Enter', the STRING statement template as shown in the right pop-up is inserted in the code.

102	INTO GED-REAJON.
110	STRING Identifier1 DELIMITED BY Identifier2
111	INTO Identifier3
112	*> WITH POINTER Identifier
113	*> ON OVERFLOW
114	*> Statement
115	*> NOT ON OVERFLOW
116	*> statement
117	*>END-STRING
118	

The cursor is moved to the Identifier field where the programmer can type the appropriate variable name. If the statement has more than one variable, Eclipse will display multiple Identifier fields that can be tabbed to.

## **Comparing different source versions**

As mentioned earlier, Eclipse maintains different source versions in the workspace on the workstation.

## Local History Compare and Replace

You can compare the current source to older sources in the same project by right-clicking the program name in the Explorer tree (or right click on the source code tab ) and then selecting the Compare With option followed by the Local History option.

	Undo Revert File	Ctrl+Z	
)EPART.	Save	Ctrl+S	
RA.	Open With	I	•
)ISPLAY	Show In	Alt+Shift+W	TATUS UPON PRIN
)ISPLAY	Cut	Ctrl+X	UM UPON PRINTER
SIKING	Сору	Ctrl+C	
	Paste	Ctrl+V	
STRING	Run As	ļ	2
INT	Debug As	1	•
ITH POI	Profile As	1	•
1 OVERF	Validate		
Stat	Team	l l	
OT ON O	Compare With	l	Each Other
stat	Replace With	I	Local History
-STRING	Preferences		
EXIT PR	Toggle Update Tag		
H-EMPLO	Remove from Context	Ctrl+Alt+Shift+Down	

STRING "ERR-STA " ERROR-STATUS

Eclipse will present the list of versions of the program in its' local history. A new tab, History, is opened in the diagnostic window at the bottom of the screen.



Double-click on the version to be compared with.

💮 Initializing Compare Editor for Compare GETB8A.COB Current an 💶 🗵 🗙
Initializing Compare Editor for CompETB8A.COB Current and Local Revision
Always rup in background
Run in Background Cancel Details >>

After the Eclipse Compare Editor is complete, you will see a window with two panes for each version listed side-by-side. Notice the title of the tab and that each window has a title indicating where the source is from.



texturges -	
GETINAL COR	Local hintory: GETBER, COB 27/84,2002 6:57:44 PM
R-PARA, DISPLAY 'ROLLBACK EKROR-STATUS = 'ERROR-STATUS UPON PRINTER, DISPLAY 'ERROR-HUM = 'ERROR-MUM UPON PRINTER, STRING 'ERR-STA 'ERROR-STATUS 'ERR-NUM 'ERROR-HUM INTO GLB-SEASON, STBING INFROIDERING INFINITERS ST INFROIDERS INTO INFROIDERING INFINITERS ST INFROM	B-PARA. DISPLAY "BOLLBACK ERROR-STATUS = ' ERROR-STATUS UPON PRINT DISPLAY "ERROR-JUN = ' ERROR-MUN UPON PRINTER. STRING "ERR-NUN = ' ERROR-NUN UPON PRINTER. " ERR-NUN = ERROR-NUN INTO GLB-REASON. "
WITH POINTER Identifier To on Overprise To Exatement To NOT ON OVERFLOW Po statement ToEND-BIRINO TO NOT ON OVERFLOW TO NOT ON OVERFLOW	<pre>FETCH-EMPLOYER.     HOVE INFN-INF TO EMPLOYER-NUMBER.     COPY GALC-EMPR-CODE.     HOVE EMPL-KODE TO INFLOTER-CODE.     HOVE EMPLOYER-TH TO EMPLOYER-NO.     HOVE EMPLOYER-COME FOILT TO CHECK-DIGIT.     HOVE EMPLOYER-COME TO INFN. </pre>
EXIT PROGRAM. * VETCH-EMPLOYER. * HOWE EMPA-IM TO EMPLOYER-NUMBER. * COPY CALC-EMPR-CODE. * HOWE EMPA-NODE TO EMPLOYER-CODE. * HOWE EMPA-NM TO EMPLOYER-KOO. * HOWE EMPLOYER-CHECK-DIGIT TO CHECK-DIGIT.	<ul> <li>PERFORM COMPUTE-EMPR-APEAS:</li> <li>SET DD-I TO 1.</li> <li>BEADCH L-BUXA-DB-AREA</li> <li>AT END GO TO EMPR-ERROR</li> <li>WHEN EMPLOYER-LO-CODE = DB-LO-CODE (DB-I)</li> <li>HOWE NAMA-KAN-DB [13-1] TO EMPLOYER-APEANAME.</li> </ul>
<ul> <li>HOVE EMPLOYED-COME TO IONE.</li> <li>PERFORM COMPUTE-EMPR-APELS.</li> <li>SET DD-I TO 1.</li> </ul>	FETCH EMPLOYER RECORD ON ERROR GO TO EMPR-REAGO, MOVE EMPLOYER-NAME TO EMP-MAME, NOVE STRRET-1 TO EMP-STRL.

You can easily determine the differences in the source code. In the above example, the latest saved version has the STRING statement that we inserted earlier. This code is in a box and a line shows where it would be inserted into the previous saved version (in local history). Eclipse does support a restore command if you want to restore from a local history version.

Right click in the editor pane and select Replace With and then Local History...

1				MOVE EMPR-IN
	Undo	Ctrl+Z		* COPY CALC-EMPI
	Redo	Ctrl+Y		* MOVE EMPR-KODE
÷	Save	Ctrl+S		MOVE EMPR-IN
÷	Cut	Ctrl+X		* MOVE EMPLOYER-
:	Copy	Ctrl+C		* MOVE EMPLOYER-
:	Paste	Ctrl+V		* PERFORM COMPUTH
	Delete	Delete		
	Select All	Ctrl+A		SET DB-I TO 1.
-				SEARCH L-BUKA-I
	Set Encoding			AT END GO TO EN
•	Find/Replace	Ctrl+F		WHEN EMPLOYER-
1-				MOVE NAMA-KAU
	Validate			
	Team		·	FETCH EMPLOYER
	Compare With			ON ERROR G
L	Replace With		•	Previous From Local History for COBOL
ł	Ignore White Space			Local History
	Show Whitespace Char	acters		Previous from Local History

The local history versions are displayed. Select the version to restore and click Replace.



fompare for the second s	
/Test/GETB8A.COB	
Revision Time	
■ 27/01/12 6:57 PM ■ 10/01/12 10:39 AM	
?	Replace Cancel

Note this will replace and save the file so the OS 2200 work file element is also updated. The new source appears in the editor pane.

# **Comparing Different Source Element**

Eclipse allows you to highlight different source elements and then compare the two sources. Highlight one source and then move the mouse to the other source and Ctrl+Click. Right click on a highlighted element and select **Compare -> Each Other** 

+ OS 2200 Explorer 🛛		
🖃 😥 CD01-ROB		
🖻 🗁 UNISYS*ROB.		
CITACHG-TX1	T.ELT	
CITACHGBTX	T.ELT	
	T.ELT	
	New 🕨	
GETB8A.COB	Open	
- 🖳 GETPROC.CO	l	
JBTEST.COB	Remove from Context Ctrl+Alt+Shift+Down	
	Mark as Landmark. Ctrl+Alt+Shift+Up	
MLFTN.FOR	Сору	
	Paste	
	💢 Delete	
E-12 CD01-ROB1	Move	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		
🙀 DEFMAS.COB		
🗄 😥 CD01-SLR		
	😽 Refresh	
E RS16B-RUN	Validate	
	Show in Remote Systems view	
PR.ELT	Rename/Type Modification	
	Run As	
	Debug As	
	Profile As	
	Team 🕨	
	Compare With	Each Other
	Replace With	Local History
	Build Configurations	

The result appears in an editor window:

+ 05 2200 Explorer 23	C Compare Cotton HobiDestrats COR - CODI HOBIDESTALS CORT 22     C CONTRACT CORT - CODI HOBIDESTALS CORT 22						
8-12 cod1-Rot	E 1nt Grove * (2 5 4 2 3 4 4						
E CONTRACTOR AND	CD03-Reb/DEPHAS.COB	CD01-RC61,DEPMAS.COB					
CITACHG-TKT SLT CITACHGTKT SLT CITACHGTKT SLT CITACHGTKT SLT CITACHGTKT SLT SCTENALCOMP.TKT SCTENALCOMP.TKT SCTENALCOMP.TKT CITACHGTKTCCOMP.TKTCCOMP.TKT CITACHGTKTCCOMP.	The second	Click Holicover.com     I TIDENTIFICATION DIVISION.     PROGRAM-ID. DEFMAS.     S     This 2200 txn is part of the Default     C click application sends and receive     C click application sends     C click application sends     C click application sends     C click application sends					
PROGLCOM	12 • of the 2200 transaction. 12 • Input message:	12 • GetDefDetail - Get Defau 13 • GetTop20ByTotRth - Top 20 De					
E CALISHS*ROOL	15 • GetTop20ByTotEth - Top 30 Defen	u 15 * EmailLetter - Email the					

Note the highlighted entry used for the right-click to initiate the compare is the source and appears in the left pane.

The icons on the top right 🔄 🔄 🔄 🛝 🏠 🕸 Provide a means to copy all source in

either direction or only the changes. Other icons provide navigation through the compare window. Hover over each icon for more details.



#### **Referencing COBOL COPY Procedure Source**

Eclipse provides a method to define the locations of the COBOL copy procedures used by the COPY statements in a program. You can refer to the COBOL compilation stream to determine what files are used. For example, there maybe an @USE to COB\$PF or an @USE to a use name that appears on the COPY <name> IN/OF <PDP file>.

Go to Menu -> OS 2200 -> Configure COBOL Procedures



Select the host connection name.

In the Workfile Paths, enter Q\*F., Q\*F., etc. Unlimited number of files can be entered.

T Configure COBOL	Procedures	
Connection Name :		
Associated Projects :	CD01-ROB,CD01-SLR	
WorkFile Paths :	unisys*rob.,sys\$lib\$*dps\$alt\$proc.,sys\$lib\$*proc\$.	
?	OK Cano	el

When you click OK, Eclipse starts the process and shows a progress dialog:

Progress Information	
Copy procedure mapping for workfile : UDSSRC*PDP\$LIB.	
(****************	)
	Cancel

There is a complete message for the host connection:





Eclipse will build information into either of the following folders:

Windows XP

C:\Documents and Settings\<User>\Local Settings\Application Data\Unisys\os2200\dd

Windows Vista \ 7

C:\Users\<User-id>\AppData\Local\Unisys\os2200\dd

If you check the DD folder, you will see the following files.

Name	Size	Туре
🖬 CD01	18 KB	File
🖻 socso	38 KB	File
copyProc.properties	1 KB	PROPERTIES File

The 'copyProc.properties' file contains the files from the wizard:

```
#Thu Feb 14 16:24:47 GMT+08:00 2013
```

CDO1=unisys\*rob.,sys\$lib\$\*dps\$alt\$proc.,sys\$lib\$\*proc\$. SOCSO=SYS\$LIB\$\*DPS\$ALT\$PROC.,Y2K\*SOURCE.,UDSSRC\*PDP\$LIB.,UDS\$\$SRC\*T-SCHEMA.

If you open one of the host connection files, you will each COBOL procedure entry name and the element it is found in including the host IP address, share, qualifier, filename and element name.

ABC \\cd01.na.uis.unisys.com\os2200\unisys\rob\procelt.130130

ALONGPROCEDURENAME \\cd01.na.uis.unisys.com\os2200\unisys\rob\procelt.130130
SCREEN-BUFFER \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\screen-defs.ucobp
SCREEN-DEFINITIONS \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\screen-defs.ucobp
SCREEN-PRINT-BUFFER \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\screen-defs.ucobp
GETSCREEN \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\get-screen.ucobp
PUTSCREEN \\cdO1.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\put-screen.ucobp
DPS-GET-WS-BUFF \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\get-ws-buff.ucobp
SCREEN-TEMP-0 \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\screen-0.ucobp
DPS-NAME-TABLE \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\name-table.ucobp
DPS-ATTR-TABLE \\cd01.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\attr-table.ucobp
DPS-CONFIG-BUFFER \\cdO1.na.uis.unisys.com\os2200\sys\$lib\$\dps\$alt\$proc\config-buff.ucobp

With the COBOL source open in the editor, hove the cursor over the COPY Procedure name . In the following example, this is INFO-BUFFER. A dialog with options to select the COPY procedure source element appears. Note al element could contain many COBOL procedures.

210	*========	== START	OF	COPY	BOOK	FOR	OS2200	DPS	Buffer
211	COPY DESSTATUSCOB.								
212	COPY INFO-BUFFER.								
213	COPY								<b>A</b>
214	СОРУ	sys\$lib\$*	dos	SaltSpr	roc info	-buff	er/ucobn		
215	COPY	eveSlibS*	hroc	Sinfo	-huffer	/cohr	<u>, , , , , , , , , , , , , , , , , , , </u>		
216	*========	<u>3930100</u>	proc	.9.1110	-ounci	1000	2		▼ =
217	СОРУ					Sel	ect the desire	d copy p	rocedure

If no COPY Procedure has been associated with the name, then an error is displayed in the status line:

No copy procedure found.

By selecting an element name in the list, Eclipse will open the element in the COBOL editor and position the cursor at the PROC statement. Note this element is not part of a project and so Search plus other functions cannot be used.



DEFMAS.COB	B INFO-BUFFER-UCOBP.COB X
1	+6+7+8
1 INFO-BUFFE	R PROC
2 /	
3 *	THIS PROCEDURE DEFINES THE INFO BUFFER FILLED AT INITIALIZATION TIME
4 *	* * * * * * * * * * * * * * * * * * * *
5 *	
6 *	
7 01	INFO-BUFFER.
8	05 INFO-SHORT-TERMID PIC 9(4) VALUE 0.
9	O5 INFO-SCREEN-NUMBER PIC 9(4) VALUE 0.
10	05 INFO-PROGRAM-ID PIC X(6) VALUE SPACES.
11	05 INFO-FUNCTION-KEY PIC 9(2) BINARY VALUE 0.

Note that if a COBOL source has been opened with OFCS, this feature is unable and the following error is shown on the status bar:

Copy procedure can't be opened if the element is not associated with a project

#### **Splitting the Editor Pane**

Sometimes a developer is coding the business rules in the Procedure Division but needs to reference some other code in the program e.g. the Working Storage section. Eclipse provides the functionality to split the editor pane into two panes. Modifications made to one pane are reflected in the other pane. If you save one pane, it saves the common course displayed in both panes.

To perform this, right click on the editor pane tab e.g. GETB8A.COB in the picture below.



Then click **New Editor**. Or go to the menu **Window → New Editor.** 



Eclipse will open a new COBOL editor pane as shown below. Both panes are displaying the same source. Updating the source in one pane will also update the source in the other pane. In fact there is only one source being edited but two panes used for editing.

📧 GETB8A.COB 🔀				
	IDENTIFICATION	DIVISION.		
	PROGRAM-ID.	GETB8A.		
	AUTHOR.	Unisys - Rob Jamieson.		
	DATE-WRITTEN.	October 2010.		

Now with the cursor on the tab, hold down the left mouse key and drag the editor pane down the screen. When the cursor is close to the bottom of the edit window, you will see a dotted line across the



middle of the edit window and a bold black down arrow on the screen. Release the left mouse key and you will have two editor panes for the same source.



Each pane can be manipulated independently but both panes are working on the same source element. In this way, one pane could show part of Working-Storage and the other pane might show part of the Procedure Division. This is useful if you can't remember data names when coding the program.

#### Navigating your COBOL Program Source

Eclipse provides a couple of methods to simplify the navigation of your COBOL program source:

- 1. Using the Outline View
- 2. Using Sections and Paragraphs

#### **Outline View**

In the COBOL perspective, you select the Outline view to see the program structure. Go to Window  $\rightarrow$  Show View  $\rightarrow$  Other.

)      -	Window Help New Window New Editor	-] @ & •] ½ - 전 - ♥ ↔ → -] ∦
2 2 2 2 2 2 2	Customize Perspective As Save Perspective As Reset Perspective Close Perspective Close All Perspectives	<ul> <li>OS 2200 Console</li> <li>OS 2200 Explorer</li> <li>OS 2200 Host Manager View - CIFS</li> <li>Outline</li> <li>Alt+Shift+Q, O</li> <li>Problems</li> <li>Alt+Shift+Q, X</li> <li>Tasks</li> </ul>
2 2 2	Navigation   Preferences	← TelnetView     Conter     Alt+Shift+Q, Q

Then select General and expand the node. Then click on Outline.

U Show Yiew	
type filter text	
General     General     General     Good Bookmarks     Classic Search     Good Bookmarks     Classic Search     Good Bookmarks     Classic Search     Good Bookmarks     Good Bookm	
•	
OK	Cancel

The perspective will show the program outline with the different COBOL divisions and paragraph names.





Drag this view to a suitable location on your workbench. My preference is to have this open on the right edge.

Note the refresh icon, *can* be used to refresh the outline as program editing is performed.

Clicking on an entry in the Outline will position the Editor pane at that location in the program. This provides a quick navigation method to areas of the code.

## **Using Sections and Paragraphs**

Highlight the section or paragraph name in a PERFORM or GO TO statement.

Press F3 or

```
🕼 DEFMAS.COB 🔀
      ----+----1----+----2----++---<mark>-</mark>3----+----4----+----5----++----6----++----7----+----8---
  578
  579
                 EXEC SQL
  580
                     USE DEFAULT QUALIFIER CONTRIBS
  581
                 END-EXEC.
  582
                 COPY USE-CONTRIB IN PROCLIB.
  583
  584
              PROCESS-TRANSACTION.
  585
  586
                 Wait and receive a message to process
                 PERFORM DPS-INPUT THRU DPS-INPUT-EXIT.
  587
```

UNISYS

To navigate to the section or paragraph, press F3.

Or right-click and select Open Declaration:



Another method is to <Ctrl>+Click and then hover over the section/paragraph name and select the hyperlink.

The cursor is positioned to the section or paragraph name.



Use the Go Backwards icon (or press <Ctrl>-Q) to return to the PERFORM or GO TO statement.

#### Auto Tag in Columns 1-6

The Auto Tag feature allows for up to 6 characters of data to be placed in columns 1-6 of each updated line of code in the COBOL source. Often these columns are used for version information.

The value to be used is defined in the **Properties**  $\rightarrow$  **Preferences**  $\rightarrow$  **COBOL** options. Go to the **Reference Format** tab. Key you value in the field and check the "Default to Auto Tabbing" box. In the example below, RJJ is the value entered.

```
Settings for AutoTag
Tag in Columns 1-6
RJJ Default to Auto Tagging
```

Then as you update the source (modify or insert), the tag value is automatically inserted in columns 1-6.

CE	🚯 *GETB8A.COB 🕱					
	+1+2+3 <mark>+</mark> 4+5+					
۲	1		IDENTIFICATION DIVISION.			
	2		PROGRAM-ID. GETB8A.			
	3		AUTHOR. Unisys - Rob Jamieson.			
	4		DATE-WRITTEN. October 2010.			
	5					
	61	RJJ	* Changed to a UCOB S/R so it can be called from EAE			
	71	RJJ	* Another comment line			
	81	RJJ	* This is a new comment line			

If you need to toggle whether the tag value appears, right click in the edit pane and select Toggle Update Tag. Lines can be highlighted as well.



	7 RJJ	* Another comment line						
	8 RJJ	* This is a new comment line						
	9 10	ENVIRONMENT DIVISION.	Undo Revert File	Ctrl+Z				
	11	CONFIGURATION SECTION.	🔡 Save	Ctrl+S				
	12	SOURCE-COMPUTER. UNIVAC-1100-7	Open With					
	13	OBJECT-COMPUTER. UNIVAC-1100-7	Show In	Alt+Sbift+₩/				
	14 UCOB	SPECIAL-NAMES.						
	15 UCOB	CARD-READER IS CARD-READER	Cut	Ctrl+X				
	16 UCOB	PRINTER IS PRINTER	Сору	Ctrl+C				
	17 UCOB	CONSOLE IS CONSOLE.	Paste	Ctrl+V				
۵	18	INPUT-OUTPUT SECTION.	Run As	•				
٩	18 19	INPUT-OUTPUT SECTION. DATA DIVISION.	Run As Debug As	•				
<u>*</u>	18 19 20	INPUT-OUTPUT SECTION. Data division. Subschema section.	Run As Debug As Profile As	) 				
٩	18 19 20 21	INPUT-OUTPUT SECTION. Data division. Subschema section. Invoke subschema b8a-subsch in	Run As Debug As Profile As Validate	) 				
٩	18 19 20 21 22	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA	Run As Debug As Profile As Validate Team	) ) ) )				
٩	18 19 20 21 22 23	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA COPYING RECORDS INTO WORKIN	Run As Debug As Profile As Validate Team Compare With	) ) ) ) )				
٩	18 19 20 21 22 23 24	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA COPYING RECORDS INTO WORKII COPYING DATA-NAMES INTO WO	Run As Debug As Profile As Validate Team Compare With Replace With	) ) ) ) ) )				
٢	18 19 20 21 22 23 24 25	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA COPYING RECORDS INTO WORKIN COPYING DATA-NAMES INTO WO RUN-UNIT-ID IS GETB8A	Run As Debug As Profile As Validate Team Compare With Replace With	           				
٨	18 19 20 21 22 23 24 25 26	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA COPYING RECORDS INTO WORKII COPYING DATA-NAMES INTO WO RUN-UNIT-ID IS GETB8A DMCA IS WORKING	Run As Debug As Profile As Validate Team Compare With Replace With Preferences	           				
٩	18 19 20 21 22 23 24 25 26 27	INPUT-OUTPUT SECTION. DATA DIVISION. SUBSCHEMA SECTION. INVOKE SUBSCHEMA B8A-SUBSCH IN OF SCHEMA SOCSO-SCHEMA COPYING RECORDS INTO WORKII COPYING DATA-NAMES INTO WO RUN-UNIT-ID IS GETB8A DMCA IS WORKING ERROR RECOVERY IS GEN-ERR-: DOUBLOU	Run As Debug As Profile As Validate Team Compare With Replace With Preferences	> > > >				

Notice that when a new line was created, the tag was not entered as shown below.

7 R0 0 "		AUOCUEL		comment time				
8 RJJ	*	This	is	a	new	comment	line	
9								
10								

# Auto Tag in Columns 73-80

Some sites want to use columns 73-80 instead of columns 1-8 to store some data like a version number.

U 05 2200 - Eclipse					
File Edit Navigate Search Project Run	OS 2200 Window Help				
📬 ▾ 😭 🚔 📄 👘 📥   👼   💦	Add a Telnet Session bound to this project. Clear Problem List Markers Update OS 2200 Project				
CD01-ROB	View Log Save Log Set Log Level				
GETB8A-COMP.TXT	OS 2200 Resource Adapters Java 5et to Java 1.6 Java 5et to Java 1.7 Configure COBOL Procedures	+			
BTEST.COB	Configure Tag for Col 73-80 C	Itrl+Shift+F5			

The following prompt appears:


😈 Tagging	×
Tag in Columns 73	80 VER1
ОК	Cancel

Data can be entered which is converted to Upper Case. The last 10 values are stored and can be selected.

When you highlight text in the Cobol editor, using <Ctrl>-T will place the selected value in columns 73-80.

42	INPUT-0	UTPUT SECTION.	
43	FILE-CO	NTROL.	JER1
44	SEL	ECT PRT-FILE ASSIGN TO DISC TPRINT.	VER1
45	SEL	ECT SRT-FILE ASSIGN TO DISC SRT-DEFAULT.	VER1
46	DATA DI	VISION.	

#### **Block Comment and Uncomment of Code**

One or more lines of code can be marked as a comment (\* in column 7) by highlight the lines of code and then doing Ctrl + /. Commented lines can be uncommented by the same process.

### Literal Length

Often in COBOL, the length of a literal is needed e.g. to make sure the destination field is sized correctly. This is achieved by highlighting the code:

668 MOVE "InitSession" TO IN-TRANS-CODE.

In the status line, the length of the highlighted field is displayed:

Length:11

#### Viewing the COBOL Areas

The different COBOL areas can be clearly indicated in the COBOL Editor by setting the Show Margins options. Go to Windows  $\rightarrow$  Preferences  $\rightarrow$  COBOL  $\rightarrow$  General and you will see the settings for the Print margin column.

```
Show print margin
Print margin column: 6,7,72,80
```

Note how the "Print margin columns" field contains 6, 7, 72 and 80. The editor will show a vertical line after these columns to indicate where the different COBOL areas are. You could modify these values for your own use.

```
      *GETB8A.COB X

      ----+-

      -1---+--2-----3-----4-----5-----6-----7----8-----

      1

      1

      2

      PROGRAM-ID.

      GETB8A.

      3

      AUTHOR.

      Unisys - Rob Jamieson.

      DATE-WRITTEN.

      October 2010.
```



### **Refreshing the Editor Content**

At times the developer might want to refresh their editor contents with the version of the data file or element from the OS 2200 host. This can be achieved by Menu -> File -> Refresh or by clicking F5. **U OS 2200 - CD01-Rob/GETB8A.COB - Eclipse** 



### Automatic Refresh when Host Contents Changed

Eclipse will be notified when the data file or element contents on the OS 2200 host are changed. In this case, a prompt is shown to allow the developer to take the necessary action.

U File Changed	×
The file 'CD01-Rob/GETB8A.COB' has been changed on the file system. D you want to replace the editor contents with these changes?	0
Yes No	

Select Yes to refresh your editor with the latest host contents. This will result in any unsaved changes being lost.

Select No to keep working on your editor contents.

### **Using Templates**

Eclipse can support the use of Templates to save coding. We have already seen how auto-completion can allow us to select the desired COBOL statement or command and then insert the code into our program source. Unisys has developed templates for UCOB but a client can define their own templates. For example, you might require a complete program template or you might want to define site standard code for database error handling etc.

If the following section, the creation, maintenance and sharing of templates is discussed. Note that this section only applies to using templates with the COBOL editor.

### **Creating Templates**

To create your own templates, you need to go to **Window**  $\rightarrow$  **Preferences** in the menu bar. Then example the COBOL entry and click on the Template entry.



Preferences		_ 🗆 ×
type filter text	Templates	$ \diamondsuit \bullet $
type filter text 	Templates         Categorization of template:         Image: templates.xml         Image: templates.xml	New Edit Remove Import Export All
i∰- Web i∰- Web Services i∰- XMI		T
	Restore Defau	lts Apply
?	OK	Cancel

The template structure consists of categories and then templates. Categories can be nested. So for our case, let's create a new category under the Reference category. Highlight the Reference folder and then click "New".

Select the Category radio button and then enter meaningful name and description. Click "OK".



💓 Add Category		×
Parent <u>c</u> ategory name:	Reference	
Category		
C <u>T</u> emplate		
<u>N</u> ame:	MyDemo Templates	
Description:	MyDemo Templates	
Keyword:		
<u>P</u> attern:		-
		-
	<u>ا</u>	
	OK Cancel	

Now we need to create our template. With our category highlighted, click the New button. Enter a meaningful name and description. The most important field for the template is the Keyword. The Keyword is used by Auto-Completion (Ctrl + Space) to present entries matching the keyword (or the leading characters that have been entered.) So it is recommended to use a prefix on the keyword that easily identifies your local templates. In the following example, MyDemo- was used as the prefix. So if the user types "MyDemo" and then clicks Ctrl+Space for auto-completion, they will see all templates with a keyword beginning with MyDemo.

🥘 Edit Template			X
Parent category name:	MyDemo Templates		
C Category			
<ul> <li>Template</li> </ul>			
Name:	DPS Txn		
Description:	Template for DPS txn		
Keyword:	MyDemo-DPS		
Pattern:	IDENTIFICATION DIVISION. PROGRAM-ID. xxxxxx * This is the skeletion for a DPS Txn		<b>A</b>
	T		▼
		ОК	Cancel

Click OK to save.



Templates
Categorization of template:
🖃 🖅 templates.xml
E Reference
🗄 💼 IDENTIFICATION DIVISION
🗄 💼 ENVIRONMENT DIVISION
🗄 💼 DATA DIVISION
🗄 💼 PROCEDURE DIVISION
🗄 💼 Common
🗄 💼 MyDemo Templates
DPS Txn
I
Description: Template for DPS txn

Description:   Template for DPS txn						
Keyword: MyDemo-DPS						
1	Pattern preview:					
	IDENTIFICATION DIVISION.					
	* This is the skeletion for a DPS Txn.					

It is recommended to use a prefix on the keyword that easily identifies your local templates. In the following example, MyDemo- was used as the prefix. So if the user types "MyDemo" and then presses Ctrl+Space for auto-completion, they will see all templates with a keyword beginning with MyDemo as shown below. (We only need enough characters to match the category hence the demo shows "myd".)

*NEWDPSTXN.COB						
	+1+2+3+-	4+5+6				
1 myd						
2	DPS Txn - Template for DPS txn	IDENTIFICATION DIVISION.				
3	Batch - Template for Batch program	PROGRAM-ID. xxxxxx * This is the skeletion for a DPS Txn.				

So if we double-click on the DPS TXN entry, the template will be copied to our editor working pane as shown below.

B *GETB8A.COB									
	+	-1+	;	2+:	3	+-	4	1	+
1	I	DENTIFI	CATI	ON DIVISIO	М.				
2	P:	ROGRAM-	ID :	xxxxxx					
3	*	This is	the	skeletion	for	a	DPS	Txn.	
4									

#### **TIP:** Turn off Auto Tag when using templates.

For this example, we also created a Batch template called Batch. The result shows how we have our 2 templates under our category of MyDemo Templates.

### **Maintaining and Sharing Templates**

Now that we have defined our templates, we may need to share them with other users. Currently the templates only exist on the local workstation. Eclipse provides Export and Import functions to assist in maintaining your templates. (Refer to the previous screen and you will see the Export/Import buttons on the right side of the window.) The Export function will create a XML file in a directory that you select by specifying the location in the Save In field. You can export categories or templates.



Exporting Templates					
Savein: 🞯 Desktop 💽 🕥 🎓 🖽 🗸					
My Computer My Recent Documents Desktop My Documents My Computer My Recent Documents My Recent My Recent My Recent My Network Places PortalDemoWorkArea RJEMPRDataSource RJEMPRDataSource					
My Network     File name:     MyTemplates.xml     Save as type:       Save as type:     *.xml     Ca	ave				

To share with other users, this export file needs to be provided to the other users so they can import it. If you maintain an OS 2200 file that contains your Eclipse information (All-In-One file, manuals, JDK installation file etc) then this might be a good vehicle to make the file easily accessible to other users.

So the other users need to do an Import as shown below.

Importing Temp	plates	? ×
Look in:	: 🞯 Desktop 📃 🕓 🤌 📂 🛄 -	
My Recent Documents Desktop My Documents My Computer	My Documents My Computer My Network Places ePortalDemoWorkArea RJEMPRDataSource MyTemplates.xml	
My Network	File name: MyTemplates.xml	Open
Places	Files of type: *.xml	Cancel



### **Templates and New Eclipse Releases**

If you do use local templates, remember to export them from the current Eclipse environment when upgrading to a new Eclipse release. These local templates will not be in the Unisys Eclipse release files.

# **Building an OS 2200 Project**

At this stage we have coded our program and now we need to build the project. When you build a project in Eclipse, a predefined set of ECL commands is sent to the OS 2200 host via a Telnet session. These commands could compile and link (MAP) one or more programs plus do other OS 2200 tasks like using SUPUR to update a TIP transaction library file.

## Configuring the Build and Brkpt properties

Earlier when we used the wizard to define a new project, we skipped the screen that requested Build and Breakpoint information. We will now update these properties of the project as it is the Build commands defined in these properties that are submitted to the OS 2200 host.

🗑 OS 2200 - Test/GETB8A.COB - Eclipse File Edit Navigate Search Project Run OS2200 Window н Open Project 📑 🕶 🔡 🔯 010 Close Project 🔶 OS 2200 Explorer 🛛 🔀 📆 Build All Ctrl+B 🕀 😥 Newrob Build Project 🗄 😥 Rob Build Working Set 🗄 😥 Rob2 Clean... 🗄 😥 Test **Build Automatically** 🖻 🗁 unisys\*rob. Clean Project 🖹 E-TEST.ELT 🗟 GETB8A-comp Properties

From the menu bar, go to **Project**  $\rightarrow$  **Properties** and click.

Or right click on the project and select **Properties** from the displayed windows:



This results in the following screen being displayed for an OS 2200 project.



### Configuring the Build Stream

Note that the Project Name, OS 2200 Connection and OS 2200 Work File are fields that are not updateable.

At the Build tab, we can enter various ECL statements that will be used to build our project based on what the programmer wants to do. In the above screen, there is the default entry. Below I have updated the Build Stream to @add an element. However you could have an @SSG call here, or compiler commands etc. Any valid ECL is allowed – just like you would do in a demand session.

Build will be the standard build.			
Build Stream	Brkpt Files OS2200 Debug Setup		
@add,l Unis	ys*rob.getb8a/comp		

It is important to note the build type. The above screen shows this is a standard build as opposed to a debug build.

Note: If you want Eclipse to detect Error, Warning and Information messages as described later, you have to set the L option on an @ADD or other processor options that generate listings.

### Creating a default Build Stream

A new option in Eclipse 3.7 can generate a Build Stream based on your project details. Click on the Generate Build Stream button at the bottom of the wizard:

```
Generate Build Stream
```



The result in my example is:

Build Stream	Brkpt Files	OS2200 Debug Setu	qu
Odelete,c ja     Ocat,p jamie     O. Set break     Obrkpt print:     O. Clear (De     O. delete,c j     Ocat,p jamie     Ocycle jamie     Oucob unisy     Ouftn unisys     Ocopy,a unis     Olink,e ,jami     include unisy     Oeof     Obrkpt print:	mieson*bkpt son*bkpt.,f, point-file in \$, jamieson* lete & Catald jamieson*obj son*objfile. s*rob(1).get s*rob(1).mlft sys*rob(1).nl ieson*objfile s*rob(1).get \$	; ///9999 Brkpt Files' tab bkpt. og) the objfile before jfile. +1).,f///9999 tb8a, unisys*rob(1). nlftn, jamieson*objfil .280141350 tb8a	e each build (Recommended) ,,,subprogram le.

This might not meet your site standards but maybe a starting point.

### Configuring the Brkpt Files

Now go to the Brkpt Files tab that looks like the following screen:

Build Stream	Brkpt Files	OS2200 Debug Setup	
Single Shar	e for all Brkpt	5	
OS2200 Bre View name	akpoint Filena	ame	
Delete a	after use.		CIFS Name

If your Build Stream commands (or the elements they use) create a brkpt file, then you can enter the OS 2200 Breakpoint Filename here. (Actually it could be any valid OS 2200 data file.) Note that if you enter a View name, then Eclipse will open a pane in the diagnostic window with the contents of the Brkpt file at the end of the project build process. Be careful with the 'Delete after use.' check as the Brkpt file will be deleted if this is checked. Note that multiple Brkpt files can be defined.

Note that Eclipse does a timestamp check on the brkpt files and will only process and display the file if the last reference timestamp is after when the build was started.



Build Stream Brkpt Files OS2200 Debug Setup				
Single Share for all Brkpts				
OS2200 Breakpoint Filename	rob*brkpt2.			
View name (optional)	rob2			
🔽 Delete after use.	CIFS Name			
\\CD01.NA.UI5.UNISY5.COM\os2200\rob\brkpt2				
Composed entry rob*brkpt2.,rob2,delete				
Add Replace Remove Move Up Move Down				
rob*brkpt1.,rob1,delete rob*brkpt2.,rob2,delete				

By highlighting a brkpt file, you can modify the settings.

### Configuring the OS2200 Debug Setup

Click on the OS2200 Debug Setup tab. Eclipse shows the setup information for a debug build. Debug builds are used with the Eclipse debugger module to provide an interactive debug session. Programs must be complied with a UCS compiler like UCOB and using the appropriate compiler options. DEBUG/FULL and NO-OPTIM are mandatory. The Eclipse PADS library must be installed on the 2200 host. Check with your system administration for the name of the installed Eclipse PADS library file – it is needed for debug builds.

Build will be the debug build.					
Build Stream Brkpt Files	2200 Debug Setup				
✓ Use Debug Build					
Debug Callback ID	Test.15149035	Add the below lines to the static link			
Debug Callback Port Number	1023	include unisys*rob.Test include eclipse2200*pads\$lib37.debuging			
Callback IP address	172.22.0.128	create reference RTS\$PINIT resolve RTS\$PINIT, TCA\$\$\$ usi lcn			
MASM Element Name	Test	change reference (pads\$init) to pads\$initec2 res all refs usi local_defs,lcn			
OS2200 Debug Library Name	eclipse2200*pads\$lib37.	conceal messages 108			
<pre>@MASM, JEVZ_unisys*rob.Test, unisys*rob. @. Create debugMsmElt @delete, c jamieson*bkpt. @cat, p jamieson*bkpt.,f///9999 @. Set breakpoint-file in 'Brkpt Files' tab @brkpt print\$, jamieson*bkpt. @. Clear (Delete &amp; Catalog) the objfile before each build (Recommended) @. delete, c jamieson*objfile. @cat, p jamieson*objfile. @cat, p jamieson*objfile. @cucob unisys*rob(1).getb8a, unisys*rob(1).,,,debug/full,no-optim, subprogram @uftn unisys*rob(1).getb8a, unisys*rob(1).,,,debug/full,no-optim @link,e_jamieson*objfile.280141350D include unisys*rob(1).getb8a include unisys*rob(1).mlftn include unisys*rob(1).mlftn include unisys*rob(1).mlftn include unisys*rob.Test include eclipse2200*pads\$iib37] debuginc create reference RTS\$PINIT resolve RTS\$PINIT, TCA\$\$\$ usi Icn change reference (pads\$init) to pads\$initec2 res all refs usi local_defs,Icn</pre>					

Note that when the **Use Debug Build** checkbox is selected, the build type is changed to indicate this will be a debug build.

The **Debug Callback Id** is used when creating your debug session. Use a unique value but a good practice is to choose a value that matches your program to be debugged.

The **Debug Callback Port Number** is the port number used by PADS to send data to the Eclipse debug session running on a workstation. Generally use the default value.

The **Callback IP address** is the IP address of the workstation where the Eclipse debug session will be run. (PADS will send information to this port.) Generally it is your local workstation IP address.

The **MASM Element Name** is the name of the element in your Project file (OS 2200 work file) where Eclipse writes the MASM element required for PADS to interface with the Eclipse debugger. With Eclipse 3.7, different elements can be created. If you are debugging multiple programs in the same OS 2200 work file, then use a value to identify each program e.g. ABC/DEBUG for program ABC.

The OS2200 Debug Library Name is the name of the Eclipse PADS library file on the 2200.

Eclipse creates a set of LINK statements that must be used in the @LINK of the program. You can copy/paste these statements as required.

In the edit window, Eclipse creates a default compilation build stream that is required for a debug build. You can edit this as required. (Note that this build stream is used for a debug build and not the build stream under the Build Stream tab but only if the Use Debug Build box is checked.) It is necessary to call the MASM processor to generate an object module from the appropriate MASM element. The LINK statements are also essential.

Before a UCS executable can be debugged:

- A special debug element must be created. This element contains information the PADS subsystem will use to call back to the PC at startup.
  - The executable needs to be static linked to:
    - Include the special debug element;
      - Include a certain debug library OM;
      - Cause a special PADS entry point to be called at start time.

Refer to the section on UCOB Debugging for more details. For now, leave the Use Debug Build unchecked.

### **Doing the Project Build**

Now that we have defined the build commands, we can perform the project build. Go to the Explorer pane and right-click on the project name. Or go to the menu **Project**  $\rightarrow$  **Build Project**.



Click the **Build Project** entry. Eclipse will pop-up a dialog with the build status.

🕞 Build Project
OS2200 Build: Test
Invoking 'OS 2200 Add Stream Builder' on '/Test'.
Always run in background
Run in Background Cancel Details >>

You will notice that Eclipse has opened a new pane called the OS 2200 Console. After the Build Project process has finished, this window appears at the bottom of the workbench as a tab in the diagnostic window.





As you can see, this OS 2200 Console pane shows the results of the build process. Firstly Eclipse has performed a @PRT,I and then submits the Build Stream ECL that we defined earlier. Note that if a Brkpt file was defined and it had a View name, it would appear as a pane next to the OS 2200 Console. You can enlarge this pane or use the scroll bars to look at the output. However Eclipse does check the OS 2200 Console and any Brkpt files for you looking for Errors, Warnings and Informational messages.

There is a pane titled "OS 2200 End Summary View" that contains the output for all lines beginning with END. (In a demand session using @ED, you may have issued FC END to get this info.) You can quickly check if any errors were reported.

	🧟 Tasks 🔝 Problems 🤇	OS 2200 End Summary View	🛛 🧻 Memory	👬 Registers 🗖 Ecli	pse 2200 Log 🜷 OS220
	type filter text				
	End Line		Project name	Build Output Set	Output Line
	END UCOB- 54 ERROF	RS(MAJOR) 8 ERRORS(MINOR) 3	W/ Test	Main	402
Ш					

Note that OS 2200 End Summary View contains the output from many project builds. This can lead to confusion so you can clear this view by clicking the following icon on the right side of the pane title:

R

By clicking on the Problems tab, you will see a summary of the results of these checks.



You can expand each type of error by clicking on the '+' sign.



🖉 Tasks 🛃 Problems 🔀 🔷 OS 2200 End S	5ummary View	🚺 Memory 🚻 Re	gisters 🗖 🗖 Eclip	ose 2200 Log 是
62 errors, 3 warnings, 9 others				
Description 🔺	Resource	Path	Location	Туре
🗉 😣 Errors (62 items)				
🚺 🕺 LSS-CSIM20161: Procedure EMPRCODE	GETB8A.COB	/Test	line 29	Problem
🚺 🕺 LSS-CSIM20161: Procedure KAWTAB n	GETB8A.COB	/Test	line 30	Problem
😣 UCOB1404: 'EMPE-MORE' is not legal at	GETB8A.COB	/Test	line 176	Problem
😣 UCOB1404: 'GEN-ERR-STATUS = ' is no	GETB8A.COB	/Test	line 95	Problem
📕 🔿		·- ·	·	

Eclipse prints the error/warning message, the project file with the problem and the source line number.

The navigation pane will also indicate the project files with errors by placing the same error icon on the name. A programmer can easily see which files have errors.



As a programmer, you would want to go to that line to correct the problem. By doubling-clicking on the problem line, Eclipse will open the element in question and position the cursor on the line in error.



In the above case, the problem entry for line 176 was double clicked and the COBOL editor opened the GETB8A file and positioned the editor at line 176. Notice the editor also indicates lines with problems – different icons are used for errors, warning and informational.



# **Interactive Debug for UCOB**

Follow the procedures described earlier for performing a debug build for the project.

## Perform the Debug Build

The UCS interactive debugger operates by causing the OM or ZOOM to call back to the PC doing the debugging during the normal run of the OM or ZOOM. To accomplish this action the executable must be static linked to include certain OMs and cause PADS to be invoked through a special entry point. This is accomplished by the debug build. The OM or ZOOM is acting as a TCP/IP client and the PC as the listener. It is necessary then that the 2200 be configured to allow calling out and that firewalls do not prevent a PC from receiving connection requests from the 2200.

### **Debug Build Best Practice**

The OM or ZOOM output with the debug settings should be placed in a different file to where the UCOB source program is located. If the source and OM/ZOOM are in the same file when the debug session is run, problems can occur.

## **Defining a Debug Configuration**

There are a number of ways to initiate the debug session but first we need to define a debug configuration. One the main icon, click on the debug 'bug'.



Then select Debug Configurations.



Or go to the menu **Run → Debug Configurations.** 

# UNISYS



The wizard displays a dialog to be filled in with information for this debug configuration. Multiple configurations can be defined.

Click the OS2200 Launcher option.

Debug Configurations		×
Create, manage, and run cor	nfigurations	Š.
Image: Server Server (External Coal Application         Image: Server Server (External Generic Server (External HTTP Preview         Image: Server Server (External HTTP Preview         Image: Server Server (External HTTP Preview         Image: Server Server Server (External HTTP Preview         Image: Server Server Server Server (External HTTP Preview         Image: Server	Name:       PROG1         unspecified       Project         RS02prog1       Debug Identifier         prog1       Port Number         1023 <ul> <li>Stop on first line</li> <li>Stop on first line</li> <li>Stop on first breakpoint</li> <li>Stop on first line</li> <li>Reve</li> </ul> Apply       Reve	rt
?	Debug C	lose



Define a meaningful name for this configuration.

The Project, Debug Identifier and Port Number should match the information used in the project debug build stream.

### **Running a Debug Session**

Click on the 'bug' and select the debug configuration to be used.



Eclipse will open the Debug Perspective.

C+0	+ 0.0.8. BE.	* 10	E dit two ( to bebut
B Codus II B Servera	- 4	H H T Vide C Medants	DATE A AM THE SO
Orwana 5-Pio Cul (SC200 Lancher)     Orwang for program to dark     Orwang for program to dark		(C) Program Telemana	
		Transing Designed Designed	1
		United by the Connection from united bits	4
It may the IT MOLECOMP.INT	. (R. Well-comp. R. F	and the second se	- A b
THEFTIFICATION DAVIES PERSONAL-DE. PEODA NOTHER, GLARY BATS-WILTTER, OALAYN CANTONIC CONVERSION CONVERSION SUBJECT-CONVERSION SUBJECT-CONVERSION CONVERSIO	00. - Bob Jamieson. y 2012. NC-1100-70. NC-1100-70. SI-NEADER S.		In Mill Antimesi Will Antimesi Will Configuration Configuration Distribution Dist
Citels / Addens Q E	eusides)		11日 - 11日 - 11日
n ormania të dhëlog të tën thui.			

Then following dialog is displayed.

Progress Information	
Starting Debug Session	
Listening for Connection from executable.	
	Cancel

At this stage you need to execute the debug OM/ZOOM on the 2200. For demand or batch jobs this can be done from the Eclipse Telnet client. For full-screen programs or transactions it must be done from an emulator.



🗐 Console 🤕 Tasks 🔝 Problems 🕟 Executables 🚺 Memory 🚧 R502 🗙	
Tape Farm: N524-5827 Console Operator: N524-6315	õ.
Current session number: 29	
Previous session was: SUN 29 JAN 2012 01:12:50 CST	
DATE: 2012-01-29 TIME: 09:48:06 CST	
>0xqt unisys*rob.prog1	

The 2200 program will communicate with Eclipse. Various messages are displayed in the dialog indicating that information is being downloaded from the 2200 to the Debug session.

OProgress Information	_ <b>_</b> _×
Starting Debug Session	
Setting Start line breakpoint.	
	Cancel

Eventually the Debug session will pause with the source code in a pane and some variables listed in the Variables view.

🔵 Debug - RSC	)2prog1/prog1.COB - Eclipse		
File Edit Navi	gate Search Project Run Window Help		
📬 • 🗔 🛯	a 🗈   🔜   lava lava   🕪 -   🕶   😓 🖏 🛷   🎄 - 🕥 - 💁 -   😂 🧔	🛷 •   🖢 • 🕾 • 🦛	← + ⇒ +
The Debug		(X)= Variables X On Br	reakpoints
	[US2200 Launcher]		Value
	Task 647027700505	WS-NAME	
	Suspended Breakpoint/INISYS*ROB.PROG1 <prog1> line: 23</prog1>	- HUNHINE	
	•		
		•	
	M		
prog1.COB	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
+-	1+2+3+4+5+6+	7+8	+9+0
17	O1 WS-NAME PIC X(30).		
18	DI WS-AGE PIC 99.		
19			
20	DDOCEDIME DIVISION		
22	OPFN-Pipi		
⇒ 23	MOVE "Robert" TO US-NAME.		
24	MOVE 52 TO WS-AGE.		
25	DISPLAY "Name: " US-NAME.		
2.6	DISPLAY "Age: " WS-AGE.		
27			
28	END-PARA.		
29	STOP RUN.		
30			

NOTE: The time it takes to call back can vary. A demand program over a fast connection generally calls back almost immediately. A transaction can take over two minutes. The speed of the connection to the 2200 effects the callback time.

The upper left of the debug perspective shows the stack. Below that is the code which is the current execution point. In the upper right is a pane which holds the variables, breakpoints, registers, and



watch views. The variables view displays all local and global variables in the selected stack frame. The registers are global, that is, registers to not change from frame to frame.

Breakpoints can be added to source by going to the required line and doing a right click.

	] pr	og1.COB	×							
Г		+-	1	+-	·2	:+		3	+-	4
	17		01	WS-NA	ME				PIC	X(30).
	18		01	WS-AG	θE				PIC	99.
	19									
	20									
	21		PRO	CEDURE	DIV	<b>ISION</b>	Γ.			
	22		OPE	N-PARA	ι.					
۶.	23			MOVE	"Rok	ert"	TO.	WS-N	JAME.	
	24			MOVE	52 <b>1</b>	0 WS-	AGI	Ξ.		
	2	Add Boo	kmark.					WS-N	JAME.	
2 Add Task										
	2 _				•		-			
	2	Show Que	uick Dih	F ,	Ctrl+	Shift+Q				
	2	Show Lin	he Num	bers						
	3	Preferer	nces							
Ļ		Add Bre	akpoint							
	2	Enable B	reakpo	bint				ibles (2	3	_
F	×_	Breakpo	int Proj	perties				חו	1	

Selecting Add Breakpoint marks the line with an indicator.

	22	OPEN-PARA.
۶.	23	MOVE "Robert" TO WS-NAME.
	24	MOVE 52 TO US-AGE.
۰	25	DISPLAY "Name: " US-NAME.
	26	DISPLAY "Age: " WS-AGE.
	0.00	

An entry is also written to the Breakpoints view.

 W= Variables
 ●
 Breakpoints
 Similar

 Image: Comparison of the state of the sta

The Variables view lists the variables defined in your source. You can change the value of a variable by highlighting the variable and doing a right click.



Name	Value	
WS-AGE		
WS-NAME	Select All Copy Variables Enable Disable	Ctrl+A Ctrl+C
	View Memory Find Change Value	Ctrl+F
	Add Global Variables Remove Global Variables Remove All Global Variable	:5

There are a number of ways of stepping thru the logic. From the debug view one can "resume", 'step into', 'step over', or 'step out'.

- 'Resume' proceeds until a breakpoint is hit or the program exits.
- 'Step into' , goes to the next executable statement whether it is in the same subroutine or a different subroutine.
- 'Step over' 💽 goes to the new executable statement in the current subroutine or the calling routine. If the next statement is in a subroutine be called by this routine, it will perform the subroutine and return, unless there is a breakpoint in the called routine.
- 'Step out' will finish executing the current subroutine and stop in the next line in the caller unless a breakpoint is hit along the way.



# **Other 3GL Editors**

Eclipse can support many types of editors that maybe used for OS 2200 and other development. This section describes some of the other editors.

## **Fortran Editor**

The Fortran editor is invoked if an OS 2200 element is given an editor type of FOR. Unisys does not provide a Fortran Editor plug-in like we do for COBOL but instead uses the Photran editor available from the Eclipse community.



```
WRITE(6,1200)
1200 FORMAT(' Convert octal seconds since midnight (TDATE$) to time')
100 WRITE(6,1100)
1100 FORMAT(' Give octal time (6 digits)')
READ(5,1000,END=999)I
1000 FORMAT(06)
IHR=I/3600
IREM=I-IHR*3600
ININ=IREM/60
IREM=IREM-IMIN*60
WRITE(6,1001)I,IHR,IMIN,IREM
1001 FORMAT(1X,'0',06,' = ',J2,':',J2,':',J2)
GO TO 100
999 STOP
END
```

When you open the element, similar features as the COBOL editor in terms of colour coding are available. The editor preferences can be found from the menu Window  $\rightarrow$  Preferences  $\rightarrow$  Fortran.



Preferences			_ 🗆 🗵
type filter text	Editor		$(- \bullet \bullet) \bullet \bullet \bullet$
	Enable folding		
🗄 - Ant			
⊕ C/C++	Enable horizontal ruler		
E COBOL	Convert tabs to spaces		
🛨 Data Management	Tab width (0 to use the workspace default)	0	
🚊 Fortran	Tab width (o to use the workspace default)	10	
	Fixed-form line length	72	
Editor	Commonte		
····· Templates	Commence		
	Identifiers		
⊕ Install/Update			
itava	Intrinsics		
⊕ Java EE			
Java Persistence	Keywords		
	Stripge		
	Solings		
Plug-in Development	Numbers and Punctuation		
Plus Preferences			
Remote Systems	C Preprocessor Directives		
⊕ Run/Debug			
terver ∴ _			
team			
Terminal			
Usage Data Collector			
Validation			
. Web			
Web Services		Restore	Defaults Apply
?			OK Cancel

## **C** Editor

The C editor is invoked if an OS 2200 element is given an editor type of C. Unisys does not provide a C Editor plug-in like we do for COBOL but instead uses the C editor available from the Eclipse community.

```
[ Imon.C 🔀
?
  #include <fp$acqfilinf.h>
?
  #include <fp$rtn$file.h>
  /* HEADER for TIP calls */
?
  #include <config.h>
#include <tip.h>
  #define TRUE 1
  #define FALSE O
  #define DEBUG TRUE
  /* PROTOTYPE Definitions of all function */
  void trim(char *trim str, char *trim char);
  void begin thread(char *application);
  void end thread();
  void check_rsa_error(rsa_error_code_type value_returned);
  void report schema(char *schemaname);
  void sa report(char *schemaname,char *sa,char *file type);
  char *get_value(char *atype, char *ename, char *schemaname);
  void do_exec(char *task);
  void get_info_ssector(char *usename,int *buffer,int *word_count,
                         int *ssector);
  void get RDMS intern(char *filename, char *qualifier, int tip num,
                        int *file size,
                        int *page size, int *index level, int *pages free);
```

When you open the element, similar features as the COBOL editor in terms of colour coding are available. The editor preferences can be found from the menu **Window**  $\rightarrow$  **Preferences**  $\rightarrow$  C/C++.



Preferences	
type filter text	Editor 🔶 🔹 👻 💌
Cype nicer text      General     Ant     General     Ant     C/C++     Appearance     Gode Analysis     Code Style     Obug     Gittor     File Types     Indexer     Language Mappings     New CDT Project Wiza     Property Pages Setting     Scripting     Task Tags     Template Default Value	C/C++ Editor Preferences. General preferences may be set via <u>Text Editors</u> .  General behavior  Smart caret positioning in identifiers  Report problems as you type  Highlight matching brackets  Highlight inactive code  Appearance color options:  Matching brackets highlight Completion proposal background Completion proposal foreground Parameter hint background Source hover background
XL C/C++ Language C COBOL Data Management Fortran CDT Integration Editor Templates Install/Update Java Lava FF	Documentation tool comments         Select the documentation tool to be used to determine editor behaviors when no project preference overrides exist         Workspace default:       None         Restore Defaults       Apply
?	OK Cancel

### **General Text Editor**

This editor is used for files with the ELT subtype etc. This is just a basic text editor with no special features. The preferences can be updated by **Window**  $\rightarrow$  **Preferences**  $\rightarrow$  **General**  $\rightarrow$  **Editors**  $\rightarrow$  **Text Editors.** 





### **Turning Off the Spell Checker**

By default, Eclipse turns on spell checking. When editing an ECL, SSG or similar element, many words are underlined in red as they are not matched by the spell checker. For OS 2200 elements, this often applies so readability is affected. Also when you copy the contents and paste to Microsoft Word, the highlighted words are inserted with underlines!

It is easy to turn off the spell checking function.

Go to **Window**  $\rightarrow$  **Preferences**  $\rightarrow$  **Editors**  $\rightarrow$  **Text-Editors**  $\rightarrow$  **Spelling** and uncheck 'Enable Spelling Check'.



type filter text	Spelling
📮 General 📃	
⊕ Appearance	
Build	Select spelling engine to use: Default spelling engine
Capabilities	
Compare/Patch	
Content Types	Options
Editors	🔽 Ignore words with digits
File Associations	Ignore mixed case words
Structured Text Ec	V Japore ceptence capitalization
Task Tags	
⊡ · Text Editors	Ignore upper case words
Accessibility	🔽 Ignore internet addresses
Annotations	Ignore pop-letters at word boundaries
Hyperlinking	
Linked Mode	Ignore single letters
- Quick Diff	🔽 Ignore Java string literals
Spelling	✓ Ignore '&' in Java properties files



# **Open File for Configured Server (OFCS)**

Often an OS 2200 developer will need to review the contents of a data file or perhaps need to review source elements quickly without the use of a project, Eclipse has the Open File for Configured Server (OFCS) feature. As this feature is outside of the planned use of Eclipse as an IDE using projects, some other features may not be available.

OFCS can be launched by going to Menu -> File -> Open File From Configured Server.



An alternative method is to click the OFCS icon 🖹 in the icon menu bar.

OFCS will display the following wizard.

😈 Ope	en File From Configur	ed Server			×
Hos	t  CD01	<u> </u>			
۲	Quick Open			<b>•</b>	
0	Qualifier	File	Element		
		*			
6	<u>*</u>				
_					
	_				,
(	PROGRAM FILES -	Q\F\E.V or Q*F.E/V DA	TA FILES - Q\F(CYC) or Q*F(CYC	I) Open	Cancel

The wizard allows for the selection of the host as well as selecting either a Quick Open or browse mode for selecting the file.

The Host field has a list box of all the configured hosts for the workspace.

Host	CD01	•
-	RS02	
۲	CD01	
	SOCSO	
0	RS16B	

The Quick Open method is selected by checking the radio button. The text box allows for the entry of a valid OS 2200 filename in either standard OS 2200 format (i.e. Q\*F.E/V) or in Posix format (i.e. Q|F|E.V). Note that either a source element or a data file can be entered. Cycle information can also be used.

😈 Open F	😈 Open File From Configured Server				
Host	CD01	<b>_</b>			
•	Quick Open	Enter in Q\F\E.V or Q*F.E/V format	•		

The list box contains the last 10 files opened using OFCS to simplify selection of a previous search.

😈 Open F	U Open File From Configured Server				
Host	CD01	<b>•</b>			
۲	Quick Open				
0	Qualifier	socso*pr. unisys*rob.jbtest			
		socso*def-rdmsdtl socso*def-rdms-k1 socso*pr			
<u>.</u>		uds\$\$src*tdt\$ unisys*rob.DEFMAS unisys*rob1.files1r1/sgs unisys*rob1.defmas JBOSS511B*JBOSS511U.DOCS			

The browse mode is selecting by checking the second radio button.

This mode allows the user to browse the OS 2200 MFD to select their file. The user can also enter the qualifier, filename or element in text boxes to help refine their selection criteria. Eclipse will use techniques to filter the matching files.

The example below shows the initial wizard screen where all qualifiers are shown in the browse window.



😈 Open F	ile From Conl	igured Sei	ver				×
Host	CD01	•	·]				
0	Outide Open					ਹ	
	Quick Open		1			1	
۲	Qualifier		File		Element		
			*			-	
			1	· ·	1		
<u>a</u>							
( <u> </u>	¢CIDUED¢¢¢		012.1	CMS1100			
			12-1				
	SIMAN\$\$		EAN				
🧀 8E	JG	🗁 BUFFE	R	E CONTRIB3	🗁 DDP	E DTP-EPORTAL	
🔁 AJ	D	🗁 CALD/	ARALE	🗁 CP131	🗁 DDP \$DUMP	🗁 E	🗁   18N
🗁 AP	P3SETUP	🗁 CD01		🗁 СРСОММ	🗁 DDP-FJT	🗁 ECLIPSE2200	🗁 IC\$
🗁 AS	is	🗁 CIFS		🗁 СРСОММ\$А	🗁 DDP-PPC	🗁 EFR	🗁 IC\$JPJVM
🗁 B		🗁 CIPHE	R	🗁 CPCOMMOS	🗁 DDP-TXFR	🗁 EFRA	🗁 IC2200
🗁 BA	W	🗁 CITA		🗁 CPFTP	🗁 DEF-TEST	🗁 EJG	🗁 IPF
🗁 BP	\$CP11-3	🗁 CITA \$	Α	🗁 CSF	🗁 DEMOUSER	🗁 EPORTAL	🗁 IRU\$
🗁 BP	\$CP12-0	🗁 CMR		🗁 CSF-UXFR	🗁 DGT	🗁 EPTRANS	🗁 JBOSS
•							•
2						Open	Cancel
$\odot$							

You can either type the required qualifier in the Qualifier text box or you can double click the required qualifier in the browse pane. If you enter a qualifier, you can use the Tab key to put the cursor in the filename text box. As shown below, when a qualifier is selected, only files with that qualifier are shown in the browse window.



U Open F	ile From Configur	ed Server			×
Host	[CD01				
0	Quick Open			<b>V</b>	
۲	Qualifier	File	Element		
	UNISYS	*			
-					
ià ne ià ro ià ro	WROB B B1				
?				Open	Cancel

As you type a value into a text box in the browse mode, Eclipse will showing entries that match the characters typed. For example, typing 'U' in the qualifier text box will filter the qualifiers in the browse window to only those starting with 'U':



You can use the same techniques to select a file name.

After selecting a file name, the browse window will contain all the source elements for a program file. For a data file, only the file is shown.



U	Open Fil	e From Configu	red Server				×
	Host	CD01	×				
	0	Quick Open			7		
	•	Qualifier	File	Element			
		UNISYS	* ROB				
	<b>*</b>						
	472	92107-004/PDF	HD	PRODLD/FILES1R1	UREPSETUP		
	📄 BEI,	JING	B JB	PROG1	XF		
		ACHG/TXT	JBTEST	PROG1/COMP			
		ACHGBTXT	KEYIN-EX	ROB			
		ACHGCTXT		SCRIPT/SQL			
		MAS	MI FTN/COMP	SOCSO/PR			
	F-TE	ST		TEST			
	EI FILF	S1R1/SGS		TEST1			
	GET	B8A		TESTCOB			
	GET	B8A/COMP	PROCELT/130130	TESTCOB/COMP			
	GET	PROC	PRODLD/CITA	TOCTEST			
	<b>?</b>					Open	Cancel

The same technique can be used to select the element name. Either enter the element name in the text box or double click on the element. OFCS will try to open the selected element from the OS 2200 program file. The following progress dialog will be displayed.

Progress Information	
Reading contents of DEFMAS from UNISYS*ROB.	
Bytes to be read 80688	
	Cancel

After the file contents have been read, Eclipse will open then in an editor. The editor type will be dynamically determined by Eclipse.





As mentioned above, OFCS can be used to open a data file. The following example shows a data file being opened using the Quick Open method.

🚺 Open F	😈 Open File From Configured Server				
Host	CD01	<b>•</b>			
۲	Quick Open	SOCSO*PR.	•		

Note for a data files, the editor has a title of the filename.elt.

PR	ELT X
	1 bbbbbbbbbbb
	aaaaaaaaaa
	3 សកមមកមកមក
	1 ZZZZZZ
	5 new line for 1st may
	6 new line

You can determine the actual OS 2200 file name by looking at the title of the Eclipse session:

😈 05 2200 - \\CD01.na.uis.unisys.co	om\os2200\SOCSO\PR - Eclipse
File Edit Navigate Search Project	Run OS 2200 Window Help
📬 🔹 😫 😫 🖷 📥   🚠	] .? 🖾 🖻 🙋 ] 🕶 ] 🏇 •
+ OS 2200 Explorer 🛛	PR.ELT X
E-12 CD01-ROB	1 bbbbbbbbbb
🔲 🖻 🗁 UNISYS*ROB.	2 aaaaaaaaaa
📕 📄 📄 CITACHG-TXT FLT	3 พพพพพพพพพพ

In the above example, CD01.na.uis.unisys.com is the host IP address, os2200 is the CIFS share name, SOCSO is the qualifier and PR is the filename.

You can even use the file cycle information to select a different cycle. By default, Eclipse will select the latest cycle unless a specific cycle is requested.

😈 Open F	😈 Open File From Configured Server			
Host	CD01	<b>•</b>		
۰	Quick Open	SOCSO*PR(-1).	•	

The browse mode text boxes can also be edited.

😈 Open F	file From Configu	red Server		
Host	CD01	•		
с	, Quick Open			-
۲	Qualifier	File	Element	
	SOCSO	* PR(-1)		

Note that the browse mode also allows for the use of wildcard searches. '\*' can be used for any number of characters and '?' used for a specific character. The example below shows the use of '\*' to match any number of characters.





The next example shows the use of the '?' to mask a specific character.

😈 Open File From Configu				
Host	CD01			
C	Quick Open			
۲	Qualifier			
	DDP-???			
<u></u>				
🗁 DDP-FJT				
DDP-PPC				

### **Restrictions with OFCS**

Eclipse is an IDE based around using projects. As OFCS doesn't use projects, some features are not available. These include:

- Search capability
- COBOL COPY Procedure reference
- Compare feature can't be used

### **Possible Workaround for Search/Compare with OFCS**

A possible workaround to provide Search/Compare capabilities for not only OFCS files but local files as well is to use a 'dummy' general project in your workspace.

In your OS 2200 perspective, go to File -> New -> Project. An alternative option is to right click in the OS 2200 Explorer View and select New -> Project.

U O	5 220	0 - Eclipse	2					
File	Edit	Navigate	Search	Project	Run	OS 2200	Window	Help
New Alt+Shift+N 🕨 🛃 OS 220				2200 Project				
😭 New Text File			📑 Proj	ect				

Then select the Project node under General.



П	New Project
	inclusion of the second

#### Select a wizard

Create a new project resource

Wizards: type filter text
Java Project
🚽 🏶 Java Project from Existing Ant Buildfile
Plug-in Project
🖻 🗁 General
Faceted Project
Project

Give your project a name that helps describe it as 'dummy' project. In the following example, the project is called 'SANDBOX'.

U New Project	
Project Create a new project resource.	
Project name: SANDBOX	
Location: C:\Eclipse 2200 3-7-2 WS\SANDBOX Choose file system: default	Browse
Working sets  Add project to working sets  Working sets:	Select
Contract	Cancel

Click Finish.

A general project is created in your workspace.





In this example, open a data file with OFCS. To move the file to the SANDBOX project, use Save-As and select Save To Workspace. Select the SANDBOX project.

U Save As	
Save As Save file to another location.	
Enter or select the parent folder: Sandbox	
<ul> <li>CD01-Rob</li> <li>Cd01-slr</li> <li>RemoteSystemsTempFiles</li> <li>S16B-RUN</li> <li>Sandbox</li> </ul>	
File name: PR.ELT	
?	OK Cancel

Now open a COBOL source element and use Save-As – Save To Workspace as well. Note the two files are now associated with the SANDBOX project.



Note that using Save-As in this case also closed the editor - when using the Save-As with 2200 projects and OFCS files, the editor remains open and merely changes the name/property as needed.



Now we will do a search over the project. Highlight the project. Go to Menu -> Search.

S 2200 Explorer 🛛	U Search
CD01-ROB CD01-SLR REMOTESYSTEMSTEMPFILES RS16B-RUN SANDBOX DEFMAS.COB PR.ELT	Remote Search       Pile Search       C/C++ Search       Port         Containing text:       Isplay         (* = any string, ? = any character, \ = escape for literals: * ? \)         File name patterns:         *         Patterns are separated by a comma (* = any string, ? = any character         Consider derived resources         Scope         Workspace       Selected resources         Working set:
And the results are displayed in the	ne Search View:



The Search scope could be changed to the entire workspace or just selected files.

When the COBOL source, DEFMAS.COB, was opened, Eclipse opened the COBOL editor – outline worked but COBOL Copy proc reference did not work. Code navigation using sections/paragraphs and opening declarations worked fine.

Now compare the file in the SANDBOX project with a COBOL source element in an OS 2200 project. Highlight the two COBOL elements, right click on the source file and select 'Compare with' followed by 'Each other'.
+ OS 2200 Explorer 🛛		
	ELT	
CITACHGBTXT.	.ELT	
- 🗟 CITACHGCTXT.	.ELT	
😪 DEFMAS.COB		
🖳 GETB8A-COM	New	
GETB8A.COB	Open	
GETPROC.CC -		
	Remove from Context Ctrl+Alt+Shift+Down	
	Mark as Landmark Ctrl+Alt+Shift+Up	
	Сору	
PROG1.COB	Paste	
SOCSO-PR.EL	💢 Delete	
🗄 😥 CD01-ROB1	Move	
🗄 😥 CD01-SLR	an Import	
REMOTESYSTEMSTEN	A Export	
🗄 🔁 RS16B-RUN		
	🔗 Refresh	
	Validate	
	Show in Demote Systems view	
	Rename (Type Modification	
	Run As	
	Debug As	
	Profile As	
	Team	
	Compare With Each Other	

The results are shown in the Editor pane.

+ OS 2200 Explorer 🛛 🗖 🗖	📴 DEFMAS.COB 🛛 🔯 🛙		('CD01-Rob/DEFMAS.COE	3' - 'San	dbox/DEFMAS.	сов') 🛛
	🔃 Text Compare 💌					
	CD01-Rob/DEFMAS.COB				Sandbox/DEF	MAS.COB
	1 xxxx				1	IDENTI
	2 user3			r	2	PROGRA
	3 IDENT	IFICATION DIVISION.		1	3	
DEFINAS.COB	4 PROGR	AM-ID. DEFMAS.			4	*=====
GETB8A-COMP.TXT	5				5	* This
GETB8A.COB	6 *=====				6	* clien
GETPROC.COB	7 * This	2200 txn is part of	the Defaulter		7	* DPS b
BTEST.COB	8 * clie	nt application sends	and receives m		8	* the m
MLFTN-COMP.TXT	9 * DPS 3	buffers (instead of	forms) are used		9	* The f
MLFTN.FOR	10 * the :	messages.			10	* of th
NEWDPS.COB	11 * The	following messages a	re used to driv		11	* In
	12 * of t	he 2200 transaction.			12	*
SOCSO-PR.ELI	13 * I	nput message:			13	*
	14 *	GetDefDetail	- Get Defaulte		14	*
	15 *	GetTop20ByTotMth	- Top 20 Defau		15	*
E CHIPPON	16 *	GetTop20ByTotAmt	- Top 20 Defau		16	*
Emer SANDBOX	17 *	EmailLetter	- Email the de		17	*
	18 *	GetLetterHistory	- Get hostory		18	*
PR.ELI	10 *	StateRnMbrDaf	- Dienlan etat		1 10	*

You can edit and update the files in the SANDBOX project. If you want to save the updates to a 2200 host, use the Save-As with Save To Configured Server.



# **Eclipse and Rolled-Out Files**

If an OS 2200 file (program or data) is stored on Fixed disk, it maybe subject to be rolled-out when mass storage reaches a threshold. When using Eclipse project or OFCS methods to access a file, the handling of a rolled-out file can be impacted by the system security level and a CIFS parameter. The information below is a summary of how Eclipse handles rolled-out files in these cases. If you are using the Eclipse Telnet session, then the same handling as per any Demand run is performed. Fundamental Security

• CIFS does not initiate a ROLBAK since the CIFS subsystem runs in privileged mode

- Error status returned to Eclipse and user gets error dialog saying file is not accessible and maybe rolled-out
- User must manually initiate the ROLBAK using a demand session e.g. @ASG,A
- Recommend CIFS\$WAITROLBAK be set to 1 so Eclipse responds immediately

### SECOPTn Security

- CIFS will initiate a ROLBAK. (If not, CIFS not installed correctly. In this case, it is likely the privileges for the userid that owns and runs the CIFS subsystem are incorrect.)
- CIFS waits until the earlier of 2 events. Note Eclipse will show no activity during this time.
  - 1. File is restored to text and CIFS then continues with Eclipse request e.g. to open the file.
  - 2. CIFS\$WAITROLBAK timer expires. Error status is returned to Eclipse and user gets error dialog.
- Recommend CIFS\$WAITROLBAK in CIFS-BACK runstream be set to 1. This would avoid the Eclipse user thinking Eclipse is 'hung'. The default value is 600 seconds. System profile should set CIFS\$WAITROLBAK to default 600. This is for OS 2200 batch and demand connections to CIFS.
- If other CIFS network connections require a longer CIFS\$WAITROLBAK period, a userid profile should be created with the appropriate value.

Contact your system administrator to modify the CIFS-BACK runstream to set the CIFS\$WAITROLBAK to 1 second. The following example shows the suggested change to the SYS\$LIB\$\*RUN\$.CIFS-BACK runstream:

@cifsut
set
CIFS\$WAITROLBAK=1
@free SYS\$LIB\$\*CIFS\$LIB
@xqt modps-z



# **Using the RDMS JDBC Client**

This section provides some guidance in using the JDBC interface located in the Data Source Explorer view of the J2EE perspective in Eclipse. This can be useful for RDMS programs where the developer wants to test a SQL command before including it in a program. However this section will also prove useful to Java developers.

It is assumed that the JDBC-RDMS software has been installed and configured on the OS 2200 host plus the relevant background service jobs are running. Review to the Relational JDBC Driver for ClearPath OS 2200 User Guide for information on the installation and configuration of the OS 2200 software. Consult your system administrator if unsure.

### **Configuring the JDBC Client**

Refer to the section 4 of the ClearPath OS 2200 IDE for Eclipse Application Development Guide for Java EE. It is assumed a folder "C:\Database Drivers" has been created and the appropriate jar files copied into this folder from the <appl group>\*JDBC\$CLIENT installed file.

Open the Java EE perspective and click on the Data Source Explorer tab.



Right click on **Database Connections** and select New.

The following dialog appears.

### UNISYS

New Connection Profile	
<b>Connection Profile</b> Create a Generic JDBC connection profile.	
Connection Profile Types: type filter text DB2 for Linux, UNIX, and Windows DB2 for i5/OS DB2 for z/OS Generic JDBC HSQLDB Informix Ingres MaxDB MySQL Oracle PostgreSQL SQL Server SQLite Sybase ASA Name: CD01 RDMS Description (optional): JDBC for CD01 RDMS	
Back Next > Finish	Cancel

Select the **Generic JDBC** connection profile type.

Enter a value in the Name field to identify this connection. Optionally enter a description. Then click **Next.** 

New Connection Profile	_ <b>_ _ _</b> ×
Specify a Driver and Connection Details  (1) Define and select a driver from the drop-down list to continue.	
Drivers:	<ul> <li>▼ ▲</li> </ul>

Click the 💷 icon to the right of the Drivers field. A dialog showing available drivers is displayed.



New Driver Definition			x
Specify a Driver Template and D	efinition Name		
🔇 Driver files not specified in driver defini	tion.		
Name/Type JAR List Properties			
Available driver templates:			
Name 🔺	System Vendor	System Version	
🖃 Database			
Generic JDBC Driver	Generic JDBC	1.0	
J			
Driver name:			
Generic JDBC Driver			
Driver type:			
Generic JDBC Driver			
?		OK.	Cancel

Select the Generic JDBC Driver.

Click on the **JAR List** tab so the JAR files copied into the C:\Database Drivers folder can be added.

Name/Type	JAR List	Properties	1						
Driver files:									
									Add JAR/Zip
								Г	

Click on the Add JAR/Zip button and browse to the C:\Database Drivers folder. Select the rdmsdriver.jar file.

Repeat for the unsiys-jca.jar file. The result should look like below.

Name/Type JAR List Properties	
Driver files:	
C:\Database Drivers\rdmsdriver.jar C:\Database Drivers\unisys-jca.jar	Add JAR/Zip

Click the **Properties** tab.



Name/Type JAR List Pr	operties
Properties:	
Property	Value
🖃 General	
Connection URL	jdbc:rdms:host=CD01.NA.UIS.UNISYS.COM;port=1544;varchar=varchar;schema=oSupplyStore
Database Name	SAMPLE
Driver Class	
User ID	

# In the Connection URL, type jdbc:rdms:host=name; port=1544; varchar=varchar; schema=OSupplyStore

where

name is the name of your OS 2200 host.

1544 is the default port number for application group 3; your port number can differ if you are using an application group other than 3 or are not using the default port.

The schema name should match the RDMS schema you want to access.

Highlight the Driver Class field and click the icon in the right edge of the field.

🔆 Available Classes from Jar List	
Provide the name of the driver class or select a class from the ave	ailable jars.
O Type class name	
Browse for class	
com.unisys.os2200.rdms.jdbc.RdmsDriver	
ок	Cancel

Click on Browse for class and highlight com.unisys.os2200.rdms.jdbs.RdmsDriver. Click **OK.** 

# unisys

New Connection Profile
Specify a Driver and Connection Details
Select a driver from the drop-down and provide login details for the connection.
Drivers: Generic JDBC Driver
Properties         General       Optional         Database:       SAMPLE         URL:       jdbc:rdms:host=CD01.NA.UIS.UNISYS.COM;port=1544;varchar=va         Uger name:       jamieson         Password:       ●●●●●●●         ✓       Save password
✓ Connect when the wizard completes       Iest Connection         □ Connect every time the workbench is started
< Back     Next >     Einish     Cancel

### Enter your OS 2200 credentials.

At this stage, we can test the connection. Click **Test Connection**. If OK, the following pop-up appears.

Success	x
Ping succeeded!	
	ОК

### Click **OK** and then click **Finish**.

The Data Source Explorer pane will now show the connection details that we have just defined as shown below.





### **Retrieving RDMS Schema Information**

Expand the database name entry. In this example, it is SAMPLE. This make take a little time as the JDBC driver is used to read key information from the RDMS catalog on the 2200.



Expanding the Schemas entry shows the available schemas.

Only RDMS schemas are displayed including internal RDMS schemas that describe DMS schema information.

Expand a RDMS schema entry and then a table entry for this schema.

You will see the columns defined for the table and their data definition.





Highlight a table entry, right click, select **Data** and then **Sample Contents**.



A new view called SQL results is opened and the data in the table is displayed.

Type query expression here				Status Result1								
Status .	Operation	Date	Connection	100	CUSTOMERID	PTANE	UNAME	STREETADORESS	CITY	STATE	ZIPCODE	NOTES
V 940	✓ Success SELECT * 06(00/2012 CD01 R0MS     ✓ Success SELECT 0(L.S 66(03)0012 CD01 R0MS     ✓ Success SELECT 0(L 66(03)0012 CD01 R0M5     ✓ Success SELECT 0(L 66(03)0012 CD01 R0M5	1	CUSTL	Frank.	Jones	123 Main 32	Muc	MN	54101	L\$0		
V Suo		2	CUST2	Ann	Tho	3456.1 m 32.	Min	MN	54112	Bg		
1 300		2	CUST3	Paul	Ste	9876 Pine R.d.	A	MN	53111	New		
1 540	HAR SELECT OSU	06/03/2012	CD01 RDWS									
1 500		06/03/2012	CD01 RDM6	1								



### **Developing and Testing SQL Commands**

Right click on the Database Connection entry.



Select **Open SQL Scrapbook**. A new Window appears as shown below.

🖪 *SQL	Scrapbook 0 🕅	
Conne	ction profile	
<u>T</u> ype:	Generic JDBC_1.x   Mame: CD01 RDM5  Database: SAMPLE	💌 Status: Connected, Auto Commit
		=1
-		

Use the list box to select the Type, the Name and the Database. These are the values we defined earlier.

Right click in this window.



📑 *SQL Scrapbook 0 🙁				
Connection profile				
Type: Generic JDBC_1.x	▼ <u>N</u> ame: CD	D1 RDMS 💌 Database: S	SAMPLE 💽 Status: Connected, Auto Commit	
		- 1 -	1	
	Undo	Ctrl+Z		
	Cut	Ctrl+X		
	Сору	Ctrl+C		
	Paste	Ctrl+V		
	Toggle Comment	Ctrl+/		
	Execute All	Ctrl+Alt+X		
	Execute Selected Text	Alt+X		
	Execute Selected Text As One	Statement Alt+C		
	Execute Current Text	Alt+S		
	Save as Template,			
	Edit in SQL Query Builder	Alt+Q		
	Preferences			
	🖁 Set Connection Info			

Click the Edit in SQL Query Builder entry.

The window for the SQL Query Builder opens. This allows you to manually type in the SQL command in the upper pane or use the advanced features described below to help automate this process.

O s	iQL Query Builder						×
	SELECT * FROM						-
	x						Þ
T	o add a table, right-dick in this pane an	d use the pop-up	i menu.		*	[> SELECT Statement	
	DISTINCT	Conditions					
	Column	Alias	Output	Sort Type	Sort Order		
Edit	SQL Results						OK Cancel

In the middle left pane (with the "To add a table..." text), right click and then click on Add Table.

To add a table, right-click in this pane and use the pop-up menu.

Add Table...

Scroll to the correct database and expand the entry to show the tables.



🗑 Add Table	x
Table name:	□       Image: Store customer         Store customer         Image: Store inventory         Image: Store store customer         Store store customer         Image: Store customer
Table alias:	
	OK Cancel

Highlight the required table and click **OK**.

A small box appears with the table name as the title and all columns listed. A check box appears next to each column.

Notice how the SELECT command in the upper pane now has this table added to the FROM clause.

FROM OSHERI VETORE STORECHSTOMER		
FROM OSOFFLISIORE.SIGRECOSIONER	Cut	
	Сору	
	Paste	
	Content Assist	Ctrl+Space
	Content Tip	Ctrl+Shift+Space
	Revert to Last Correct	Source
<u> </u>	Clear to Template	
	Change Statement Type	e
STORECUSTOMER	Omit Current Schema	
	Due 601	

Right click in the upper pane and select **Run SQL**.

The JDBC driver will pass the command to the 2200 for processing and return the results. If the command is in error, this is reported.

Ratus         Operation         Date         Connection         CUSTOMER2D         FNAME         UNAME         STREETADDRESS         CITY         STATE         ZIPCOCE         NOTES           V         Success SELECT *         06/03/2012         C001 ADMS         CUSTOMER2D         FNAME         Date         CUSTOMER2D         FNAME         STREETADDRESS         CITY         STATE         ZIPCOCE         NOTES           V         Success SELECT *         06/03/2012         C001 ADMS         CUSTC         FNAME         Tho         2456 Lst St.         Mi         NN         54112         Big cust           3         CUST3         Paul         Step         9476 Pine Rd.         An         NN         53111         New Kit	
✓ Succesc SELECT * 06/03/2012 CD01 PDMS     1     CUST1 Finals Inc 3456 1st St. Mi MN 54103 Litins 52     CUST2 Ann Tho 3456 1st St. Mi MN 54112 Big cust     3     CUST3 Paul Step 9876 Pms Rd. An NN 53111 New de	and the second se
2 CUST2 Ann Tho 3456 1st St. Mi MN 54112 Big cust 3 CUST3 Paul Step 9676 Pine Rd. An MN 53111 New die	y products.
3 CUST3 Paul Step 9876 Pine Rd. An MN 53111 New die	mer, be nicel
	x.
Total 3 records shown	
Con Builde	

Note that the bottom left of the SQL Query Builder window now has the option to select **Edit** or **SQL Results.** If you click on SQL Results, the data returned from the 2200 based on the submitted SQL command is shown.

# UNISYS



Click **Edit** to return the query builder editor.

In the bottom pane, we can set different options for the SQL command. In the middle left pane, check the columns that you want to display. Now look at column tab in the bottom pane. We see the columns we selected are listed as Output is checked.

SQL Query Builder									
SELECT CUSTOMERID, FNAM FROM OBUPPLYSTORE.STO	ME, LNAME DRECUSTON	, NOTES ER							
STORECUSTORER				**		(Des	ELECT Sides	ent	Ľ
CUSTOMERED						*			
_									
DISTINCT Columns   Conditions   Groups   Group	Conditions								
Column	Alas	Output	Sort Type	Sort Order	11				
STORECUSTOMER. CUSTOMERID	1 Array	R	and the second s						
STORECUSTOMER.FNAME	_	96							
STORECUSTOMER.LNAME		12	-						
STORECUSTOMER, NOTES		10							
		_	1						
R SQL Results									

Run the SQL command and confirm that the output only contains the selected columns.

Vite many extression here	Satur Result			
Status Operation Date Connection	CUSTOMERID	FNAME	LNAME	NOTES
Success SELECT * 06/03/2012, CD01 RDMS	1 CUSTI	Frank,	Jones	Likes Sony products.
Succeek SELECT CUS 06/03/2012, CD01 RDMS	2 CUST2 3 CUST3	Paul	Thomas Stephens	Big oustomer, be nice New client.

In the middle left pane, add another table.

Note the SQL command is updated with the new table in the FROM clause.

Select some fields in the new table.

We can also select the fields to be used to join the tables. In the example below, SUPPLIERID is highlighted in the STOREINVENTORY table. The mouse is held down and the cursor dragged to the SUPPLIERID in the STORESUPPLIER table. Note that the system shows a line linking these fields. Also note that the SQL command now has a JOIN and ON clauses added.



#### 💭 SQL Query Builder

SELECT OSUPPLYSTORE.STOREINVENTORY.ITEMID, OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID, OSUPPLYSTORE.STORESUPPLIER.COMPANYNAME FROM									
OSUPPLYSTORE.STOREINVENTORY JOIN OSUPPLYSTORE.STORESUPPLIER ON OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID = OSUPPLYSTORE.STORESUPPLIER.SUPPLIERID									
STORE INVENTORY SUPPLIERID DESCRIPTION QTYONHAND PRICE SUPPLIERID SUPPLIERID COMPANYNAME STREETADDRES TV STREETADDRES SELECT Statement									
-				•					
Columns Conditions Groups Group C	onditions								
Column	Alias	Output	Sort Type	Sort Order					
OSUPPLYSTORE.STOREINVENTO		~							
OSUPPLYSTORE.STOREINVENTO		$\checkmark$							
OSUPPLYSTORE.STORESUPPLIER		$\checkmark$							

Run the SQL command and check the results. As shown below, we get the required information. ITEMID and SUPPLIERID come from the STOREINVENTORY table while COMPANYNAME comes from the STORESUPPLIER table.

¢	OSQL Query Builder									
	Type query expression here					Status Result1				
	Status		Operation	Date	Connection		ITEMID	SUPPLIERID	COMPANYNAME	
	$\checkmark$	Succeed	SELECT *	06/03/2012	CD01 RDMS	1	ITEM1	SUPL1	Anderson Supply	
	1	Succeed	SELECT CUS	06/03/2012	CD01 RDMS	2	ITEM2	SUPL2	Peters Papers	
	1	Success	SELECTION	06/02/2012	CD01 DDMS	3	ITEM3	SUPL2	Peters Papers	
	· · ·	Succeed	DELECT ODU	00/03/2012	CDUI RDM5	4	ITEM4	SUPL1	Anderson Supply	

In the bottom pane, click on the **Conditions** tab. This is how we can easily define the WHERE clause to apply to our SQL command. Click on the column field and only valid columns are shown. Select a value. Then select the Operator and finally select the Value. Note the value could be a literal or a column entry from a table.

SQL Query Builder				×
SELECT OSUPPLYSTORE.STORE INVENT OSUPPLYSTORE.STORESUPPLIER.CC FROM OSUPPLYSTORE.STORE INVENT WHERE OSUPPLYSTORE.STORE INVEN	ORY.ITEMID, C MPANYNAME ORY JOIN OSUF TORY.SUPPLIEF	SUPPLYSTORE.STORE: PPLYSTORE.STORESUPP RID = 'SUPL1'	INVENTORY.S PLIER ON OS	SUPPLIERID,
STORE INVENTORY ITEMID & SUPPLIERID DESCRIPTION QTYONHAND	SUPPLIER			SELECT Statement
Columns Conditions Groups Group Conditions				
Column	Operator	Value	AND/OR	
OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID	=	'SUPL1'		

Note the WHERE clause is now added to our SQL command. We only wanted to see SUPPLIERIDs equal to 'SUPL1'.

Run the command and check the results.



	🔆 SQL Query Builder									
Type query expression here					Statu	Result1				
	Status	Operation	Date	Connection		ITEMID	SUPPLIERID	COMPANYNAME		
	🗸 Succ	ec SELECT *	06/03/2012	CD01 RDMS	1	ITEM1	SUPL1	Anderson Supply		
	🗸 Succ	ec SELECT CUS	06/03/2012	CD01 RDMS	2	ITEM4	SUPL1	Anderson Supply		
	🗸 Succ	ec SELECT OSU	06/03/2012	CD01 RDMS				I .		
	🗸 Succ	eed SELECT OSU	06/03/2012	CD01 RDMS						
					1					

We can still edit the command in the upper pane. This might be necessary if you want to format in a certain way. For example, you might want to copy the command into a COBOL program and therefore the columns restrictions of 12 through 80 apply. After editing the command, you can run it again to make sure no editing mistakes were made.

ſ	🕞 *SQL Scrapbook 0 🕱	
	Connection grofile           Iype:         Generic JDBC_1.x           Vame:         CD01 RDMS           Database:         SAMPLE           Status:         Connected, Auto Commit	
	SELECT OSUPPLYSTORE.STOREINVENTORY.ITEMID, OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID, OSUPPLYSTORE.STORESUPPLIER.COMPANYNAME FROM	1
I	OSUPPLYSTORE.STOREINVENTORY JOIN OSUPPLYSTORE.STORESUPPLIER	
	ON OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID = OSUPPLYSTORE.STORESUPPLIER.SUPPLIERID	
	WHERE OSUPPLYSTORE.STOREINVENTORY.SUPPLIERID = 'SUPL1'	

When satisfied, you can save this command or copy the command to paste into a program source. If pasting into a 2200 program source, remember to open the OS 2200 perspective first. Then you can open the appropriate source program if not already open.

### **Changing SQL Commands**

The above example referred to the SELECT command which is used by default.

In the SQL Query Builder window, go to the middle right pane and right click on **SELECT Statement**:

SELEC	T Statement
Add Common Table Expression (WITH)	
	Convert to FULLSELECT (UNION)
	Change Statement Type

Click on Change Statement Type.

💮 Change SQL Statement Type	×
Changing the SQL Statement Type will cause the current statement to be replaced by $\hfill \Gamma$ Statement type	y a new empty statement.
SELECT	<b>_</b>
	K Cancel

Expand the list box to view the available SQL commands.



Select the required command and then click **OK**. The SQL Query Builder changes for the selected command. In the following example, INSERT was selected.

🗑 SQL Query Builder				×
INSERT INTO VALUES	his pane and use the pop-up menu.	**	- Division T Stateme	ے ح 19
	uery name:			y.
Column	Value			
Ede SOL Results				
row last upper				OK Cancel

Note the difference in the lower pane. You can also only have 1 table shown in the middle left pane since we are doing an INSERT.

VALUES ('ROB', 'Robert', 'Jamieson', NULL, NULL, NULL, NULL, NULL, NULL) NULL)  STORECUSTORER  COMMENT  NAME  NULL  NUL	VALUES ('ROB', 'RO NULL)	obert', 'Jamieson', NU	LL, NULL, NULL, NULL,		
STORECUSTORER CUSTORER CUSTOR	NULL)	obere , comicion , no	in, many money more,		
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	<sup>2</sup> Values C Subquery Query Johann NAME NAME TREETADORESS JTY	rvatue: Value Robert' "Jamieson' MLLL MLL			ŝ
IPCODE NULL	Values C Subquery Query okann NAME TREETADORESS ITY TATE	riatee: Value Robert' Jamieson' NLLL NLLL NLLL	*		J
KOTES NAL	<sup>2</sup> Values (° Subguery Query olumn NAME NAME TREETADORESS ITY TATE IPCODE	riatee: Yokue Robert' "Jameson' MLL NLL NLL NLL	•		5
tertes treat	Values C Subquery Query Solaren NAME NAME TREETADORESS JTY TATE IPCODE VITES	ruane: Yakar Robert' Jamisson' NLL NLL NLL NLL NLL NLL NLL			ذ
	Values C Subquery Query okami NAME NAME TREETADORESS ITY TATE IPCCOE OTES	riatoe: Value Robert' "Jamieson' NULL NULL NULL NULL NULL			3
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If the column is defined to allow NULLs, then NULL is used as the default value but can be overwritten.

### Avoiding the Schema Qualification

In the above examples, each field is qualified by schema, table and column e.g.



#### OSUPPLYSTORE.STORESUPPLIER.SUPPLIERID

Generally in 3GL development on the OS 2200, a developer would issue a USE DEFAULT QUALIFIER or USE DEFAULT SCHEMA statement to define the schema name. Both options are valid but experienced OS 2200 developers maybe more familiar with the former while new OS 2200 developers may know the latter. If the field is not qualified with a schema name, it uses this default qualifier value.

In many database systems, the default schema name is the user ID (or Authorization ID). However, in RDMS the default schema name is always "rdms". If you want to avoid using the schema name to qualify all table names, you must set the default schema (also called the QUALIFIER) for the connection. This is done by adding a connection property when you define the connection (e.g., schema=OSUPPLYSTORE). You can also tell the Eclipse SQL Builder to not add schema names. Check the "Omit current schema" box, then select the "Schema name" option and enter your schema name that you added to the connection properties (e.g., OSUPPLYSTORE).

Eclipse by default will include the schema in the field definition but it can be configured to omit the schema name. Go to **Preferences**  $\rightarrow$  **Data Management**  $\rightarrow$  **SQL Development**  $\rightarrow$  **SQL Query Builder**.

Preferences	
type filter text	SQL Query Builder $\leftarrow$ $\star$ $\Rightarrow$ $\star$ $\checkmark$
<ul> <li>eneral</li> <li>Ant</li> <li>C/C++</li> <li>COBOL</li> <li>Data Management</li> <li>Connectivity</li> <li>Label Decorations</li> <li>SQL Development</li> <li>Execution Plan View C</li> <li>General</li> <li>SQL Editor</li> <li>SQL Editor</li> <li>SQL Query Builder</li> <li>SQL Results View Opti</li> <li>Fortran</li> </ul>	Default values for the Omit Current Schema settings associated with SQL statements  Current schema Authorization ID Schema name:

Check the "Omit current schema" box.

The result is:

SELECT	SUPPLIERID,	COMPANYNAME
FROM	OSUPPLYSTORE	.STORESUPPLIER



# **Obtaining Eclipse Updates**

Unisys provides an Eclipse update site to provide updates to a released version. The update site is available at:

ftp://ftp.support.unisys.com/pub/2200/IDE/Eclipse-2200-3-7/com.unisys.ca.updatesite.

The following instructions provide the steps to process the update. Please follow the below process to update.

1. In the Eclipse window, Go to "*Help*" menu and choose "Install new Software". In the Install window, click on the "Available Software Sites" as shown below.

😔 Install	
Available Software	
Work with: <sup>10</sup> type or select a site	<u>Add</u>
Find more	e software by working with the <mark>"<u>Available Software Sites"</u> preferences.</mark>
type filter text	
Name	Version
Details	Hide items that are already installed
Group items by category	What is <u>already installed</u> ?
☐ <u>C</u> ontact all update sites during install to find required software	
?	< Back Next > Einish Cancel

2. Now click the "Add" button to specify the location for the Eclipse 2200 All-in-One update site. This should bring up the "Add Site" window. Enter the URL specified above in the Location field.

🗑 Add Repository 🛛 🔀			
<u>N</u> ame:	2200-feature	L <u>o</u> cal	
Location:	jar:file:/D:/OS2200/Required-Jars-for-os2200/Eclipse	Archive	
?	ОК	Cancel	

3. We shall choose the OS2200-feature label from the drop-down box with the label "*Work with*" at the top of the dialog. (Note : We shall make sure that the "*Contact all update sites*"



during install to find required software" option is UNCHECKED)

- 4. Now the two feature should be listed in the "Name" box, namely;
  - com.unisys.ca.feature
  - org.eclipse.cobol.feature

We shall choose both these features and click on "Next" and in the following window accept the licenses and finish the update process.

If you are using C or C++ editors, you have to update Eclipse with mandatory plug-ins (CDT and JST) from the eclipse community (<u>www.eclipse.org</u>). Unisys also maintains these plug-ins on our product site. Please be advised that this is the old version of CDT and JST. In case any customer needs the latest plug-ins, they have to download it from <u>www.elipse.org</u>.

Clients can check for updates if there are any PLE's released. The client will know from product site if there are any PLE raised and what were the issue reported and the fix provided in the update. Unisys recommends for receiving alerts when new releases or updates are available.



# **Appendix A – Eclipse Quick Keys**

### **Eclipse Shortcut Keys**

	CTRL+SHIFT+L	Show all shortcuts	
Editor Shortcuts		Search	
CTRL+D	Delete line	CTRL+H	Search
ALT+Up	Move line up (or down)	CTRL+J	Incremental
ALT+Left	Previous/next editor/file	CTRL+K	Find next
CTRL+SHIFT+O	Organize Imports	CTRL+SHIFT+K	Find previous
CTRL+1	Quick Fix		
CTRL+M	Maximize tab	Debugging	-
CTRL+I	Correct Indentation	F5	Step Into
CTRL+SHIFT+F	Format Code	F6	Step Over
CTRL+L	Goto Line Number	F7	Step Return
CTRL+Q	Last Edit Location	F8	Resume
CTRL+T	Display type hierarchy	F11	Debug Last Launched
F4	Show type hierarchy	CTRL+SHIFT+B	Toggle Breakpoint
F3	Type declaration		
F2	Show info	Opening	
CTRL+O	Quick outline	CTRL+SHIFT+T	Open type

		CTRL+SHIFT+R	Open resource
CTRL+.	Next Error	CTRL+E	Show open editors
CTRL+,	Previous Error	CTRL+F6	Open editors
		CTRL+W	Close editor
CTRL+Space	Content Assist	CTRL+SHIFT+S	Save all
CTRL+SHIFT+Sp	Parameter Assist	CTRL+SHIFT+W	Close all
CTRL+/	Comment	CTRL+N	New project
ALT+/	Word Completion		
		Moving	
Refactoring		Moving CTRL+F7	Move between views
<b>Refactoring</b> ALT+SHIFT+R	Rename	Moving CTRL+F7 CTRL+F8	Move between views Move between perspectives
<b>Refactoring</b> ALT+SHIFT+R ALT+SHIFT+L	Rename Extract to local variable	Moving CTRL+F7 CTRL+F8	Move between views Move between perspectives
<b>Refactoring</b> ALT+SHIFT+R ALT+SHIFT+L ALT+SHIFT+M	Rename Extract to local variable Extract to method	Moving       CTRL+F7       CTRL+F8       Running	Move between views Move between perspectives
Refactoring ALT+SHIFT+R ALT+SHIFT+L ALT+SHIFT+M ALT+SHIFT+Y	RenameExtract to local variableExtract to methodChange method signature	Moving         CTRL+F7         CTRL+F8         Running         CTRL+F11	Move between views Move between perspectives Run application
Refactoring ALT+SHIFT+R ALT+SHIFT+L ALT+SHIFT+M ALT+SHIFT+Y ALT+SHIFT+Z	RenameExtract to local variableExtract to methodExtract to methodChange method signatureUndo refactoring	MovingCTRL+F7CTRL+F8CTRL+F8RunningCTRL+F11CTRL+F11CTRL+ALT+P	Move between         Move between         perspectives         Run application         Publish apps
Refactoring ALT+SHIFT+R ALT+SHIFT+L ALT+SHIFT+M ALT+SHIFT+Y ALT+SHIFT+Z	Rename         Extract to local variable         Extract to method         Change method signature         Undo refactoring	MovingCTRL+F7CTRL+F8CTRL+F8RunningCTRL+F11CTRL+F11CTRL+ALT+PCTRL+ALT+R	Move between         Move between         perspectives         Run application         Publish apps         Run In Appserver
Refactoring ALT+SHIFT+R ALT+SHIFT+L ALT+SHIFT+M ALT+SHIFT+Y ALT+SHIFT+Z	RenameExtract to local variableExtract to methodExtract to methodChange method signatureUndo refactoringI	MovingCTRL+F7CTRL+F8CTRL+F8CTRL+F1CTRL+F11CTRL+ALT+PCTRL+ALT+PCTRL+ALT+RCTRL+ALT+RCTRL+ALT+D	Move between views         Move between perspectives         Run application         Publish apps         Run In Appserver         Debug In Appserver



Quick Key	Function
Ctrl + /	Toggle Comment (*) indicator in col 7
Ctrl Space	Auto completion mode is invoked