Installing the Cmpware CMP-DK
(Demo Version 2.2.1 for Eclipse 3.2)

Cmpware, Inc.

Introduction

The *Cmpware Configurable Multiprocessor Development Kit (CMP-DK)* is a multiprocessor simulation and software development environment. Its goal is to provide fast and efficient modeling of multiprocessor architectures and to provide support for the software development of such systems. The goal of supporting software development is achieved by providing a display-rich environment that permits large amnounts of information to be displayed in a fast, simple and uncluttered format. Such capabilities are essential in analyzing the behavior of multiprocessor systems.

This demonstration version of the *Cmpware CMP-DK* (version 2.2.1) for Eclipse 3.0 and higher contains all features of the standard toolkit, but restricts the simulation model to a 3 x 3 array of MIPS and SPARC-8 processors. All simulation capabilities and displays are included. This includes:

- Source Code Tracing
- Source Code Variables
- Disassembly
- Memory Display
- Power Estimator
- General Purpose Registers
- Special Purpose Registers
- Command Line Interface
- Processor Utilization
- Link Utilization

The Eclipse Integrated Development Environment (IDE)

Eclipse is a popular open source Integrated Development Environment (IDE). It is completely implemented in Java and runs on most modern computing platforms which support Java. This includes most Windows, Linux, Macintosh and Unix workstations. In addition, many tool vendors have migrated their IDEs to Eclipse. Strategic members of the Eclipse Foundation include IBM, Intel, Borland, Sybase, Wind River, SAP and others. These companies, along with dozens of others hve begun to provide software development environments using Eclipse.

Because of this widespread use, you may already have Eclipse installed on your system as part of a 3rd party development toolkit. If this is the case, then you can skip the remainder of this section and move on to the installation of the *Cmpware CMP-DK* plugin. If you do not already have Eclipse installed, the best source is the Eclipse web site at:

http://www.eclipse.org/

Go to the **Downloads** section and follow the appropriate instructions for your system. The current version of Eclipse is 3.2, although the Cmpware CMP-DK should work with Eclipse version 3.0 and later.
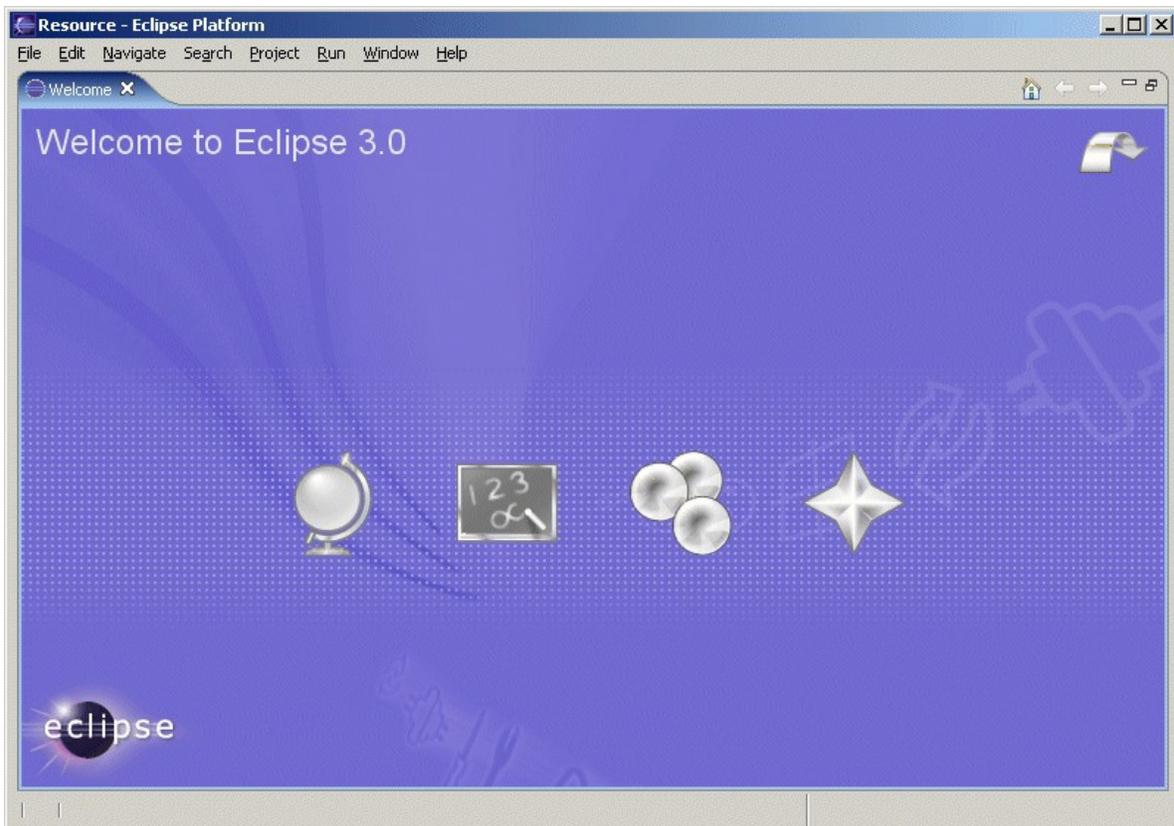
Figure 1: The Eclipse 3.0 welcome screen.

You may chose to download other Eclipse-based systems particular to your environment. Many processors and processor cores now offer Eclipse support. It is possible to both import this third party processor support into Eclipse, or to load the

Cmpware CMP-DK into these 3rd party Eclipse toolkits. If you are interested in using such a 3rd party tool, please contact the distributor for more details on obtaining the latest version of their Eclipse-based software.

Installing the Cmpware CMP-DK Plugin

The *Cmpware CMP-DK* is implemented as an Eclipse plugin. This is a piece of software that can be easily downloaded and installed to work with the Eclipse IDE, and with other plugins in the Eclipse IDE. Figure 1 shows the initial welcome screen of the 3.0 version of Eclipse. Clicking on the arrow icon in the upper right corner brings up the standard Eclipse display as shown in Figure 2.

Figure 2: The Eclipse 3.0 initial display.

Note that Eclipse is a highly configurable IDE. Colors, fonts, window placement and many other functions of the Eclipse IDE can be customized. In the examples below the

default configuration is used. Configuring the many aspects of the Eclipse IDE is beyond the scope of this document, and the reader is referred to the many documents on-line at the Eclipse.org web site or to one of the many commercially available books on the subject. Most of the configurations are relatively simple, particularly for users who have used similar development environments.

Whether the Eclipse 3.0 as in Figure 2 is being used, or some earlier version or some 3rd party Eclipse-based IDE, the process for downloading and installing the Cmpware CMP-DK plugin is the same. All that is required is an internet connection that permits data to be downloaded. Any machine with a working web browser should be sufficient. Some systems may have issues with *proxy servers*, but these may be configured in the Eclipse IDE when necessary using the **Windows --> Preferences --> Install/Update** configuration page. If this is an issue on your system, see the Eclipse documentation for more details on the proper configuration options.
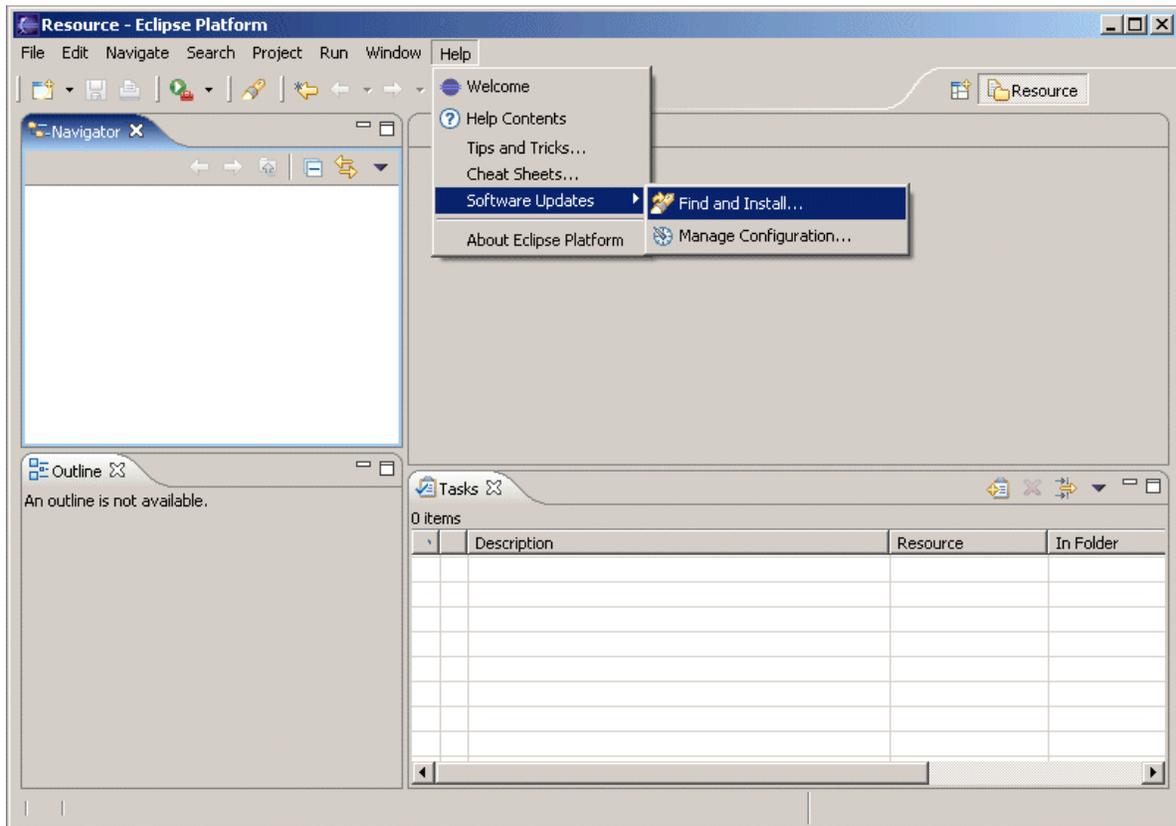
Figure 3: The menu for installing a plugin.

Figure 3 shows the menu selection used to begin the Cmpware *CMP-DK* plugin installation process. Selecting the **Help --> Software Updates --> Find and Install...** menu item will open up the dialog box in Figure 4.

This dialog box offers two choices. Select the "**Search for new features to install**" item and continue the installation process with the **[Next >]** button. This will bring up the Install dialog box as shown in Figure 5. In this dialog box, click on the **[New Remote Site...]** button on the right. This will bring up nested "**New Update Site**" dialog box as shown in Figure 5.
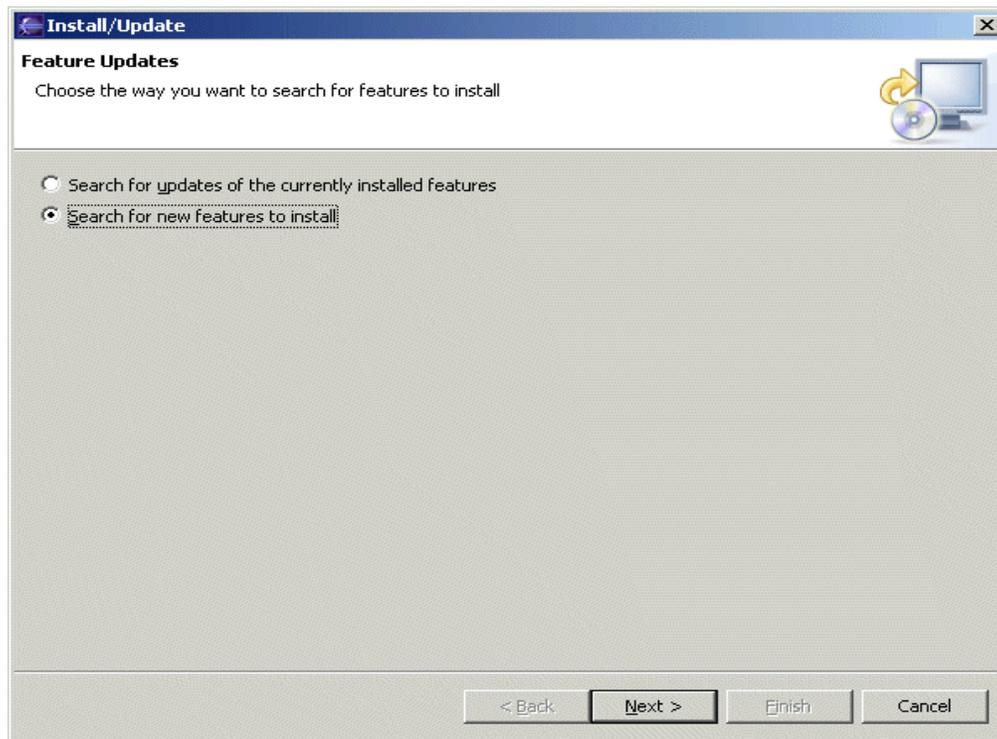
Figure 4: The Install / Update dialog box.

To access the *Cmpware CMP-DK* update site, fill in the fields as shown in Figure 5. The "**Name:**" item can be anything used to identify this update site. In this case we have chosen "**Cmpware CMP-DK Demo**". The next field, "**URL:**" is more important and must be specified correctly. For the *Cmpware CMP-DK* demo, the update site is **http://www.cmpware.com/demo/**

Once the **[Ok]** button is clicked, a new update site will be added as shown in Figure 6.

Click on the check box next to the "**Cmpware CMP-DK Demo**" and Eclipse should begin to access the internet to look for this particular plugin. If there are problems accessing this site, check the network settings in your Eclipse installation and be sure that proxy servers and other configurations are correct. Another less likely source of problems at this point is that the *Cmpware* web site may be down. Check the main *Cmpware* page at *http://www.cmpware.com/* If this page displays correctly, this is typically not the problem.
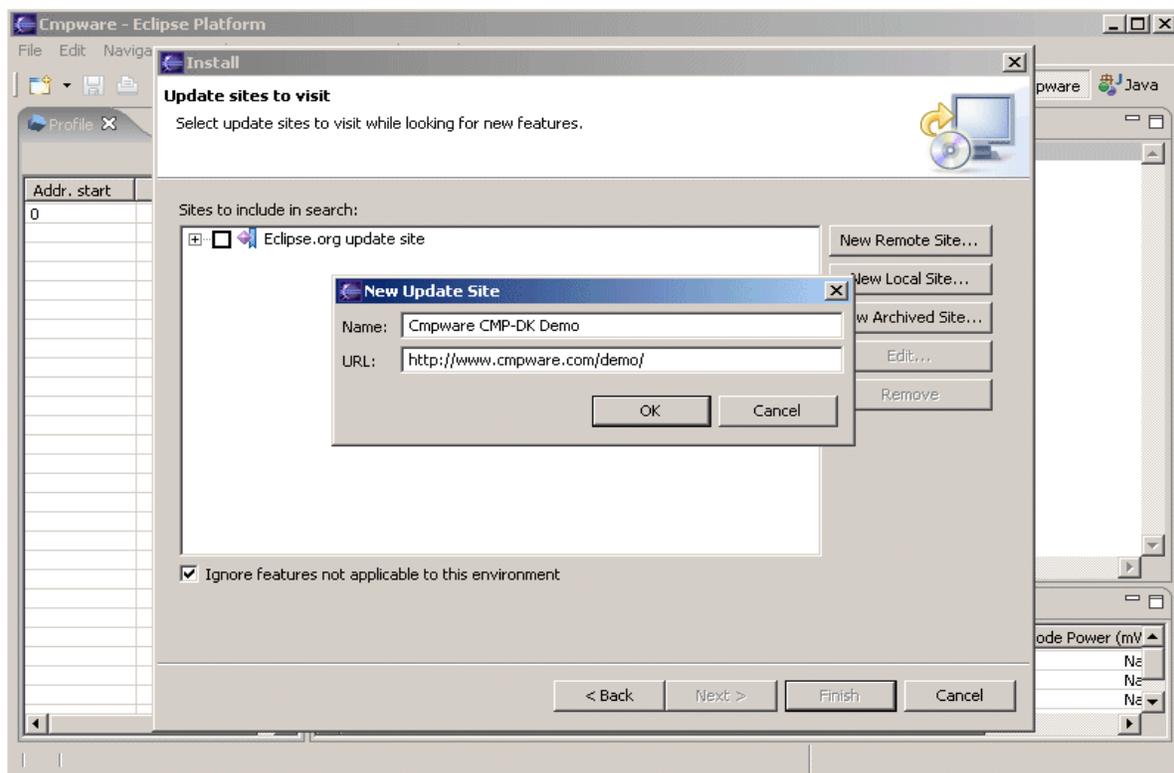
Figure 5: The Install site selection dialog box.

After the "**Cmpware CMP-DK Demo**" has been selected, click on the **[Next>]** button. This will bring up the dialog box in Figure 6. If the Cmpware Demo update site has been found, there should be one entry for the version 2.2.1 of the "**com.cmpware.ide**" feature from "**Cmpware, Inc.**".

Click the check box to the left of the Cmpware feature, selecting it for installation. Clicking the **[Next>]** button continues the installation process bringing up the License dialog in Figure 7. Select the button indicating acceptance of the license and continue by pressing the **[Next>]** button. This bring up the final installation dialog box as in

Figure 8.
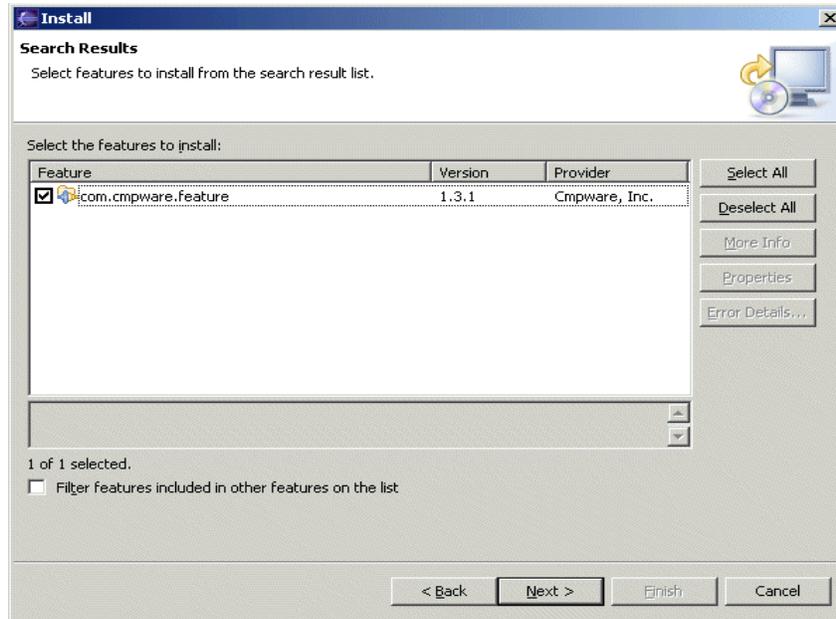
Figure 6: The Install feature selection dialog box.
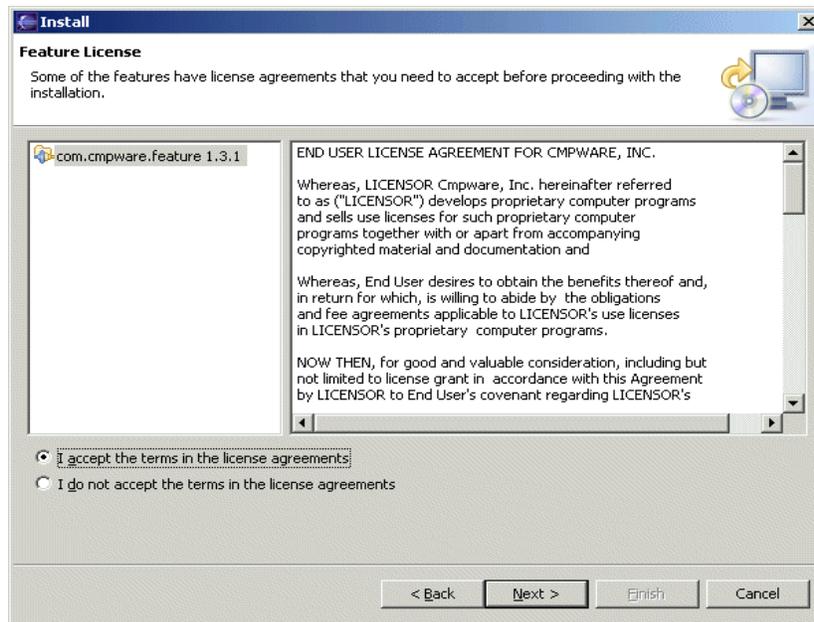
Figure 7: The License Accept Install dialog box.

Once the **[Finish]** button is pressed, the download and installation should being, and the plugin installation is complete. Eclipse may require a re-start to properly initialize the plugin, and a restart dialog box may appear. If such a restart request is made, it is best to restart Eclipse as suggested.
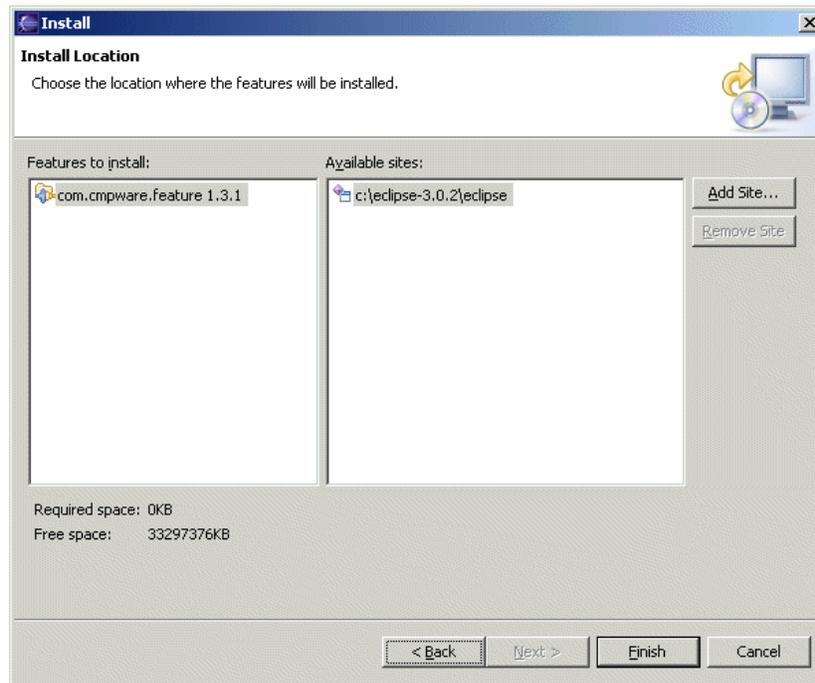
Figure 8: The final Install dialog box.

Opening the Cmpware CMP-DK Perspective

The *Cmpware CMP-DK* Eclipse plugin is implemented as a "perspective". This is a collection of windows and controls that operate as a group. Other example Eclipse Perspectives would be "Debug" or "Source Control" or any activity which would require a specific set of controls and windows. Perspectives are Eclipse's way of providing quick access to such grouped functionality. Figure 9 shows how to bring up the new *Cmpware CMP-DK* perspective.

Select the **Window --> Open Perspective --> Other ...**   This brings up the small dialog box containing all of the available perspectives in the current installation as in Figure 10. Selecting the "**Cmpware**" item from the list will bring up the Cmpware perspective as in Figure 11.
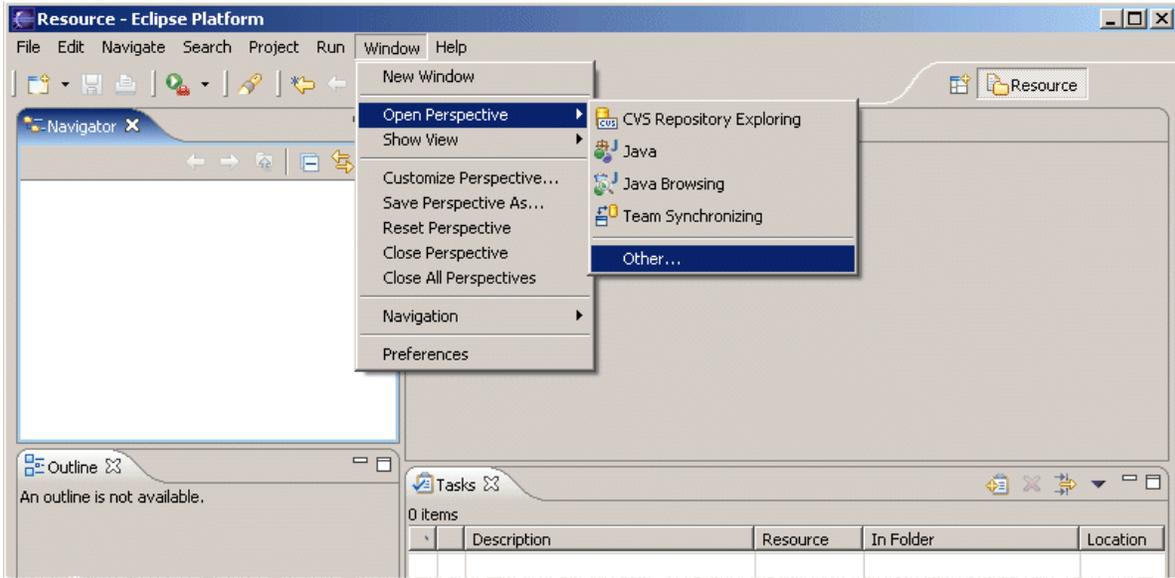
Figure 9: Opening a new Eclipse perspective.
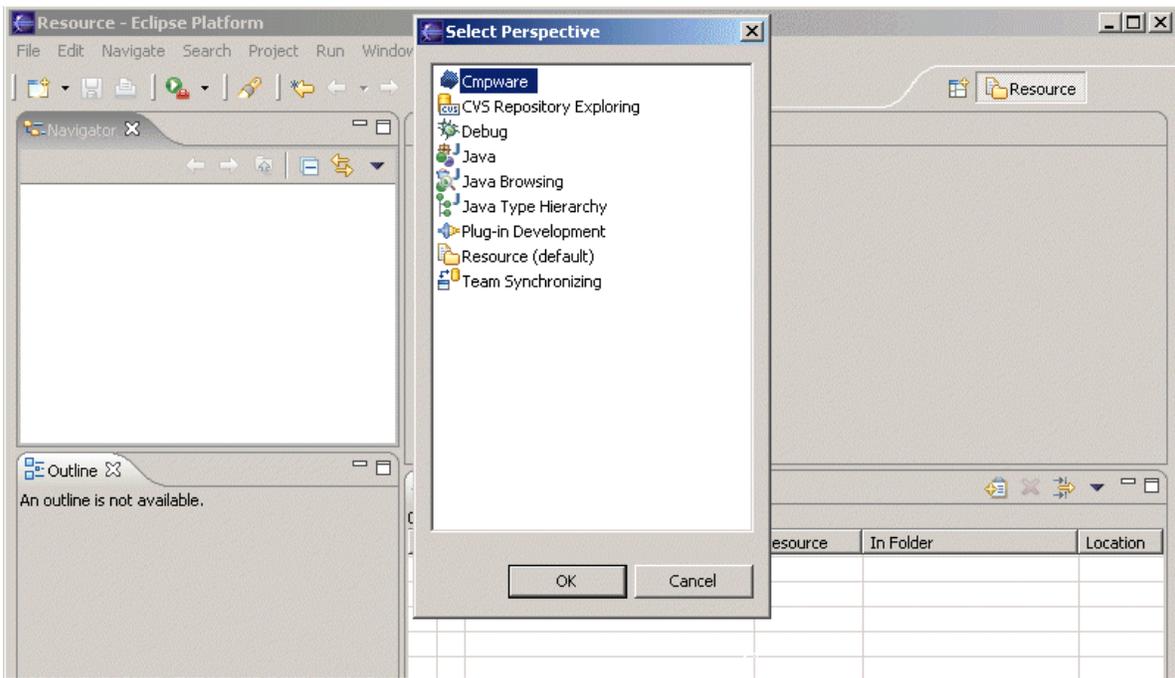
Figure 10: Selecting the *Cmpware CMP-DK* perspective.
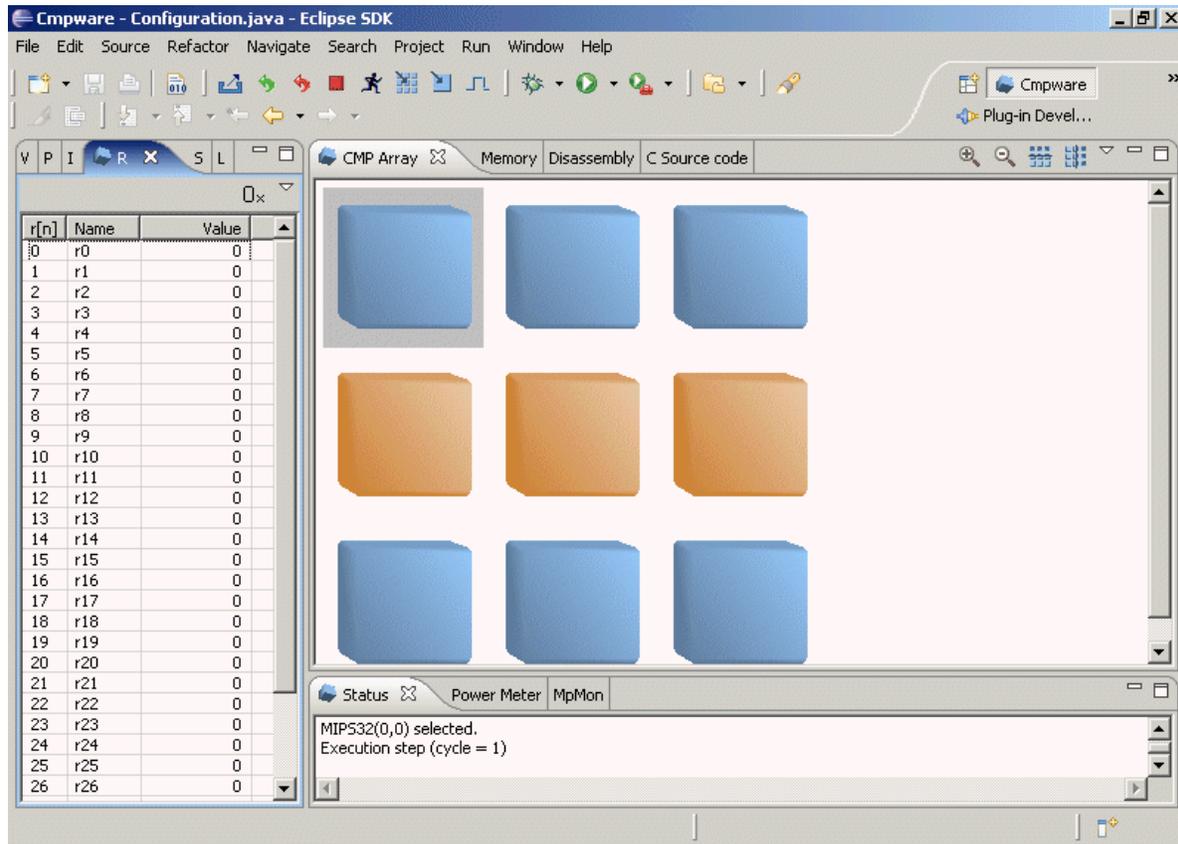
Figure 11: The *Cmpware CMP-DK* perspective.

Cmpware CMP-DK Preferences

The *Cmpware CMP-DK* has a **Preference Page** that permits configuration of various
parameters. Figure 12 shows the Preference Page. This dialog box is brought up by
selecting the menu items **Window --> Preferences** and selecting the **Cmpware** item
from the list.

Currently, the *Cmpware CMP-DK* preference page is used to configure the
multiprocessor model, to set the step size and to control the license manager. In this
demonstration version, the Processor model cannot be changed and no license is
required to run the software. The one item that may be changed is the **Step Size**. This
permits larger execution steps to be taken. Note that data is gathered and displayed

only after each step, so overall execution will be faster, but the display data will be at a coarser granularity.
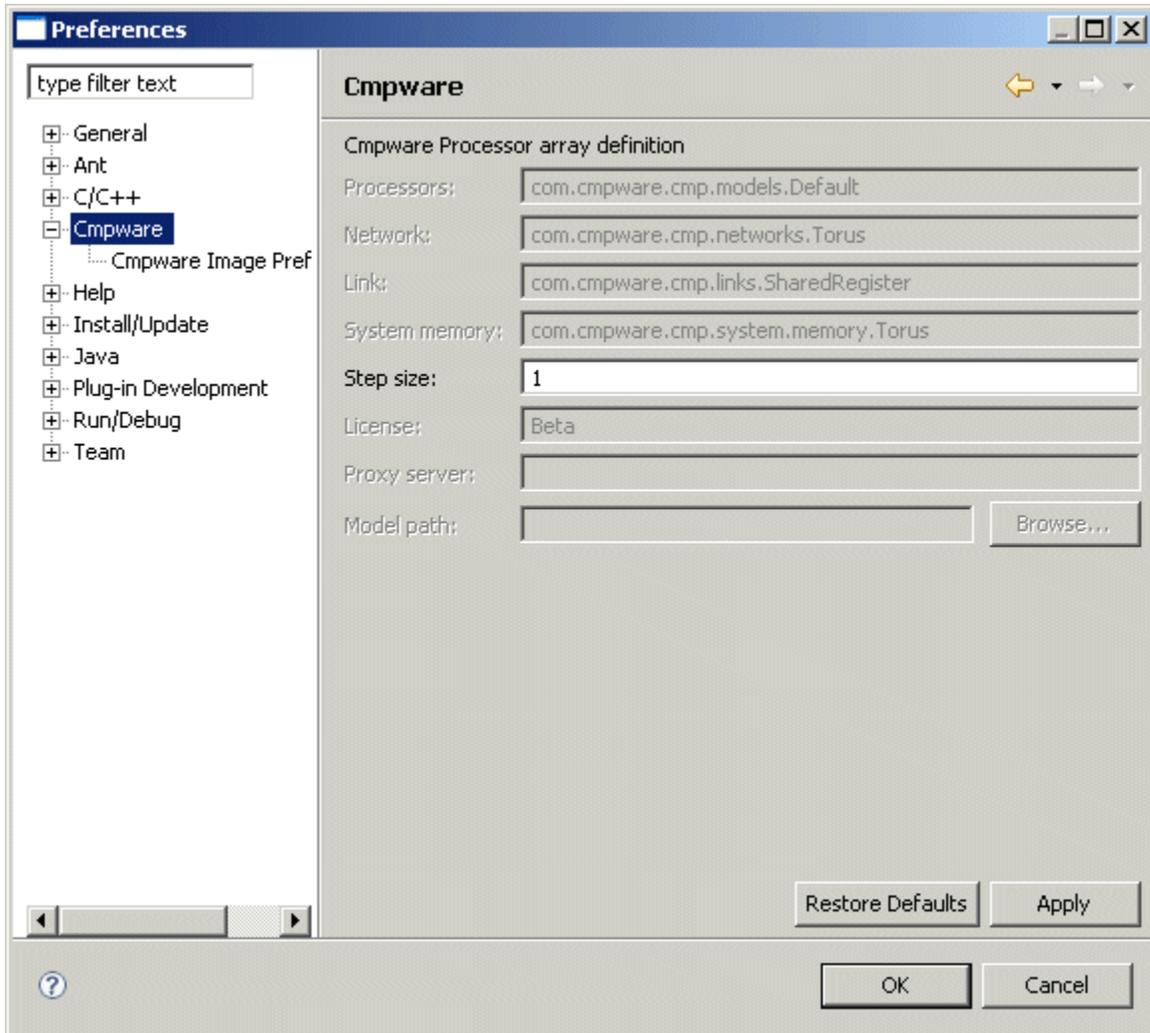
Figure 12: The *Cmpware CMP-DK* preference page.

Demonstration Applications

A variety of applications for this demonstration version of the *Cmpware CMP-DK* can be downloaded from the Cmpware web site and executed on this demonstration version of the software. These demonstrations start with very simple code to verify that the

system is installed and operating correctly, to more complex multiprocessor code including such the Fast Fourier Transform (FFT), a Finite Impulse Response (FIR) filter and the Advanced Encryption Standard (AES). These applications have been compiled and contain source and executable files, so there is no need to have access to MIPS or SPARC-8 compilers and other software development tools. It is possible, however, to implement, compile and execute your own applications on this demonstation version of the *Cmpware CMP-DK.* Tools for these processors are available from a wide variety of sources.

Finally, these applications are all partitioned to execute on multiple cores and can often be run on many more cores than the demonstration software allows. They give some indication of the techinques that can be used to develop multicore software. But these techniques are only one possibility. Other approaches, tools and even languages can be used to produce software which executes on the *Cmpware CMP-DK* models.

More documentation and the code for these applications can be found on the Cmpware web site under the **Downloads -> Demonstration Application** links (*http://www.cmpware.com/Apps.php*).

Conclusions

The *Cmpware CMP-DK* can be used to quickly and accurately model the execution of software on an embedded multiprocessor system. The rich display environment combined with the fast simulation provide an environment ideal for architecture modeling and software development for these systems.

While the execution and display features of the *Cmpware CMP-DK* are notable, much of the power of the system lies in its ability to quickly and flexibly construct processor, network, link and multiprocessor models. This modeling capability is a large part of the commercial version of the *Cmpware CMP-DK*.

For more information on the commercial version of the *Cmpware CMP-DK* see out web site at:

http://www.cmpware.com/

or send an email to:

info@cmpware.com