Adding menus, toolbar and popup menus to the Eclipse IDE - Tutorial

Lars Vogel

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Eclipse Commands tutorial

This tutorials describes how to add commands, menus and toolbar entries to the Eclipse IDE.

This article is based on Eclipse Kepler (4.3).

QUICK LINKS

- 22 Feb - RCP Training
- 29 Feb - Android Training
- vogella Training
- vogella Books

Table of Contents

Warning: This tutorial describes the Eclipse 3.x API which is used for Eclipse IDE plug-in development. For Eclipse RCP you should use the new Eclipse 4 API which is described in the **Eclipse RCP tutorial**.

2. Introduction to commands

Eclipse IDE extensions use the commands framework to contribute actions to the user interface. This concept is based on extension points.

This description explains the usage of commands in Eclipse IDE extensions. To define and use a command you have to define three extensions. The following extension points are relevant to define a menu or toolbar contribution for an Eclipse plug-in.

Table 1.

Extension Point	Description
org.eclipse.ui.command	Declarative description of the component
org.eclipse.ui.handlers	Defines the behavior, e.g., the Java class which should be called
org.eclipse.ui.menu	Where and how should the command be included in the user interface, e.g., menu, popup menu, toolbar, etc.

3. Commands

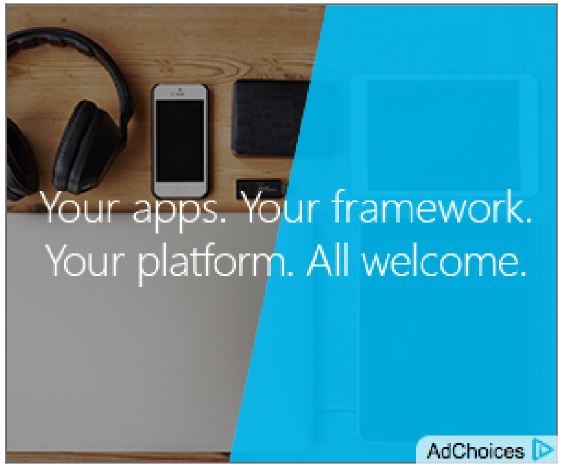
3.1. What are commands?

A command in Eclipse is a declarative description of a component and is independent from the implementation details.

A command can be categorized, assigned to the user interface and a key binding can be defined for the command. The behavior of a command is defined via a handler.

3.2. Relevant Extension Points for Commands

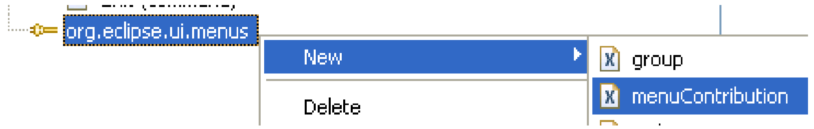
To define a command you create an extension to the `org.eclipse.ui.command` extension point.



4. Defining the command usage in the UI

4.1. Menu extension points

The `org.eclipse.ui.menu` extension point is used to define where the command is visible in the application, e.g., you could define that the command is visible in the application menu or in a view menu.



The *menuContribution* contribution has an ID value which allow to identify the contribution.

menuContribution has an `locationURI` attribute which allows to define where in the user interface a command is displayed. This different attribute values are summarized in the following table.

Table 2. Location URIs

Contribution to	Description	Uri
Application menu	Displays the command in the menu of the application	menu:org.eclipse.ui.main.menu
Application toolbar	displays the command in the toolbar of the application	toolbar:org.eclipse.ui.main.toolbar

View toolbar	displays the command in the toolbar of the view	toolbar:viewId - For example to display a menu to view with the Id "View1" use "toolbar:View1".
Context menu / pop-up	Command is displayed in a context menu, e.g., right mouse click on an object	popup:ID

4.2. Defining the position of a menu extension

Frequently you want to position a new command behind or before another command. For example the *Save All* menu entry should be positioned after the *Save* menu entry.

You can define the relative position of a command in this locationURI by using the pattern *`?before=ID`* or *`?after=ID`*.

The ID can be an existing separator name, menu ID, or item ID. The command will then be placed before or after the element with the corresponding ID.

For example if you want to add a command to an existing menu with the *`fileMenu`* ID behind the menu entry with the *`oneEntry`* ID use the *`menu:fileMenu?after=oneEntry`* locationURI .

5. Handler

5.1. Command Handler

The `org.eclipse.ui.handlers` extension point connects the command to a certain class which is called once the command is executed.

The behavior of a command is defined via handlers. The handler is the class which is executed once the command is called and must implement the `IHandler` interface from the `org.eclipse.core.commands` package.

In most cases you extend the `org.eclipse.core.commands.AbstractHandler` class which provides a default implementation for the `IHandler` interface.

The `execute()` method is called if the handler is executed.

In the `execute()` method you get access to frequently used values and services via the

`HandlerUtil` class.

5.2. Validity of handlers

Handler can be defined with conditions (activeWhen) under which define the conditions under which the handlers are valid for a command. You can define several handlers for a command but only handler can be valid for a command at a certain point. Otherwise the Eclipse runtime will not enabled the command.

6. Prerequisites for this tutorial

This tutorial assumes that you have basic understanding of development for the Eclipse platform. Please see **Eclipse RCP Tutorial** or **Eclipse Plug-in Tutorial** if you need any basic information.

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~~new shirt~~ code-level insights.
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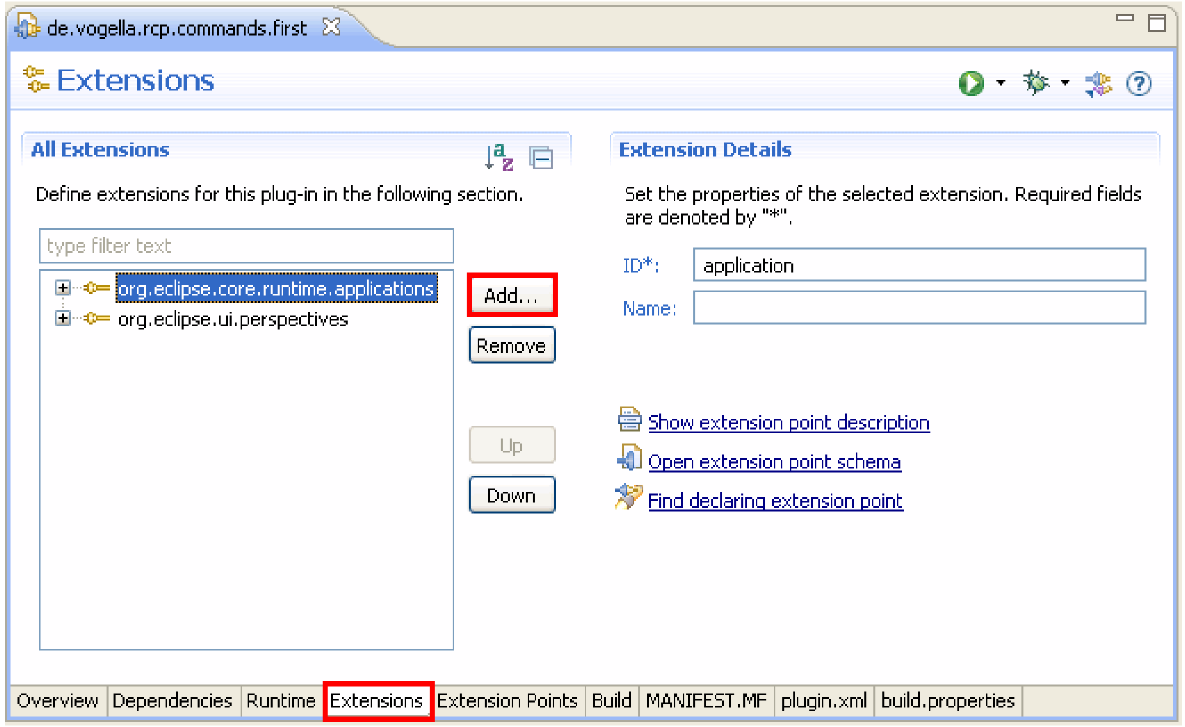
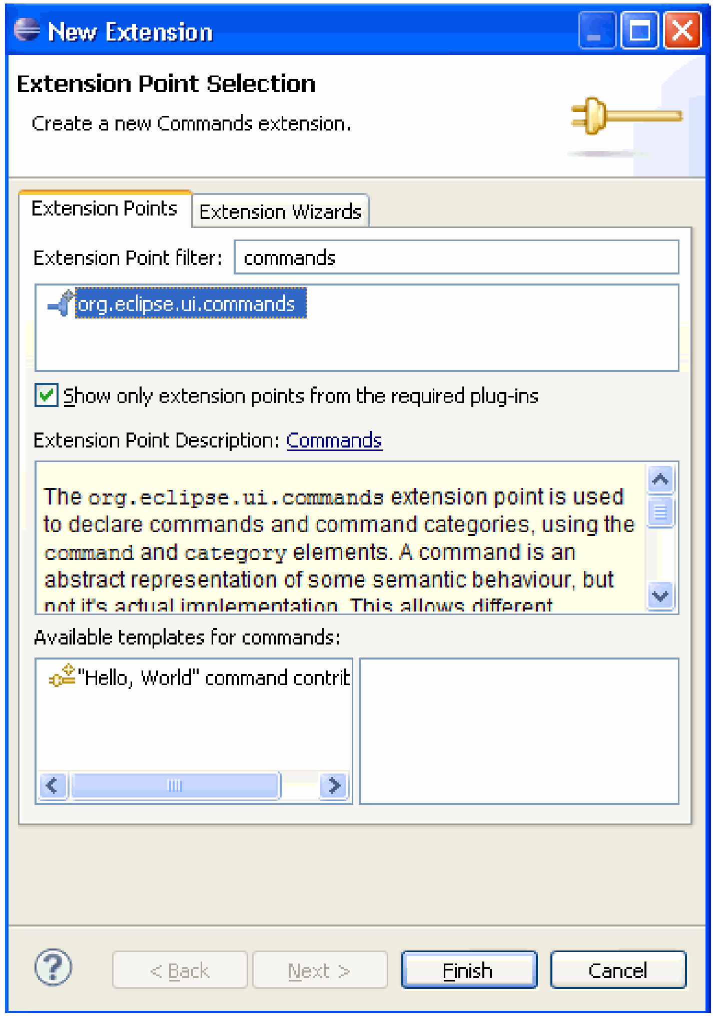
7. Tutorial: Commands and menus

7.1. Defining commands

We will create a command which will exit the application. Create a new **RCP project** "de.vogella.rcp.commands.first" using the "Hello RCP" template. Click on the plugin.xml and select the Extensions tab. Press the *Add...* button.


de.vogella.rcp.commands.first
Extensions
All Extensions
Define extensions for this plug-in in the following section.
type filter text
org.eclipse.core.runtime.applications
org.eclipse.ui.perspectives
Add...
Remove
Up
Down
Extension Details
Set the properties of the selected extension. Required fields are denoted by "*".
ID*: application
Name:
Show extension point description
Open extension point schema
Find declaring extension point
Overview
Dependencies
Runtime
Extensions
Extension Points
Build
MANIFEST.MF
plugin.xml
build.properties

Search for the extension "org.eclipse.ui.commands". Select it and press finish.


New Extension

Extension Point Selection

Create a new Commands extension.

Extension Points | Extension Wizards

Extension Point filter: commands

org.eclipse.ui.commands

[✓] Show only extension points from the required plug-ins

Extension Point Description: Commands

The org.eclipse.ui.commands extension point is used to declare commands and command categories, using the command and category elements. A command is an abstract representation of some semantic behaviour, but not it's actual implementation. This allows different

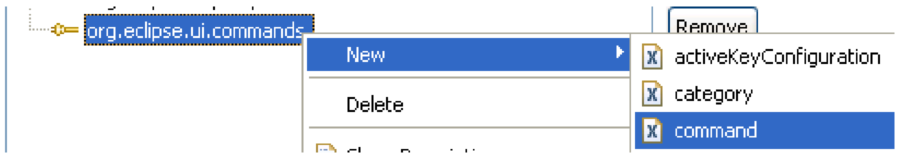
Available templates for commands:

"Hello, World" command contrit

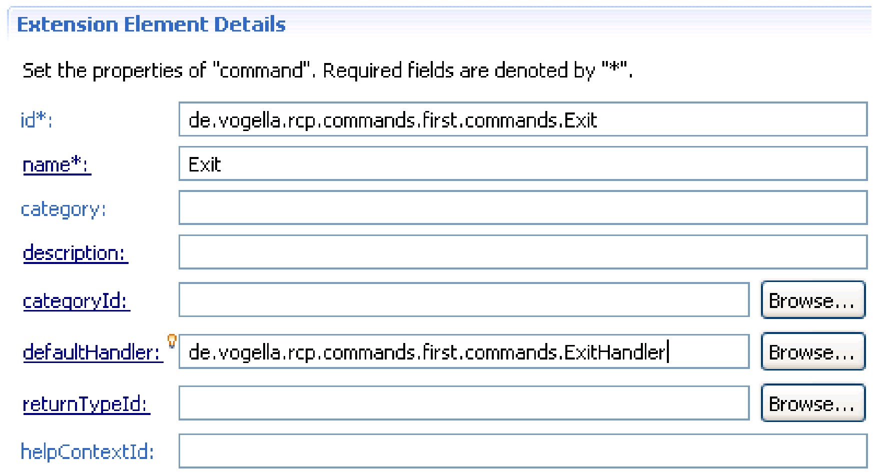
< Back | Next > | Finish | Cancel

Create a new command by right-click on your extension point and by selecting New -> command.

Tip: If you only see an "Generic" entry you most likely have not downloaded "Eclipse for RCP/Plug-in Developers". Please see **Eclipse Installation**.



Set the ID to "de.vogella.rcp.commands.first.commands.Exit" and the name to "Exit". Enter the class "de.vogella.rcp.commands.first.commands.ExitHandler" as defaultHandler.



Extension Element Details

Set the properties of "command". Required fields are denoted by "*".

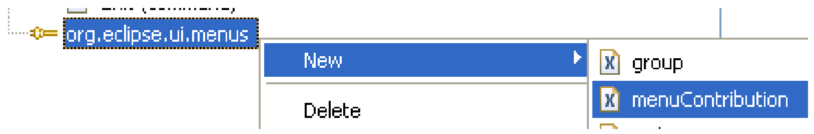
id*:	de.vogella.rcp.commands.first.commands.Exit
name*:	Exit
category:	
description:	
categoryId:	
defaultHandler:	de.vogella.rcp.commands.first.commands.ExitHandler
returnTypeId:	
helpContextId:	

Press the hyperlink "defaultHandler" to create the class which should extend "org.eclipse.core.commands.AbstractHandler".

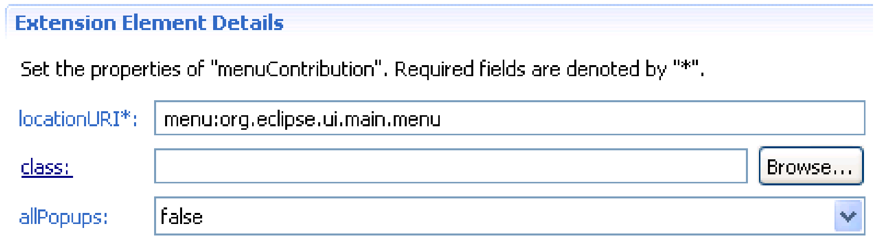
```java
package de.vogella.rcp.commands.first.commands;

import org.eclipse.core.commands.AbstractHandler;
import org.eclipse.core.commands.ExecutionEvent;
import org.eclipse.core.commands.ExecutionException;
import org.eclipse.ui.handlers.HandlerUtil;

public class ExitHandler extends AbstractHandler {

  @Override
  public Object execute(ExecutionEvent event) throws ExecutionException {
    HandlerUtil.getActiveWorkbenchWindow(event).close();
    return null;
  }

}
```

7.2. Using commands in menus

The command which we defined should be used in a menu. Add a extension to the `org.eclipse.ui.menus` extension point. Right-click on the extension point and select *New → menuContribution*.



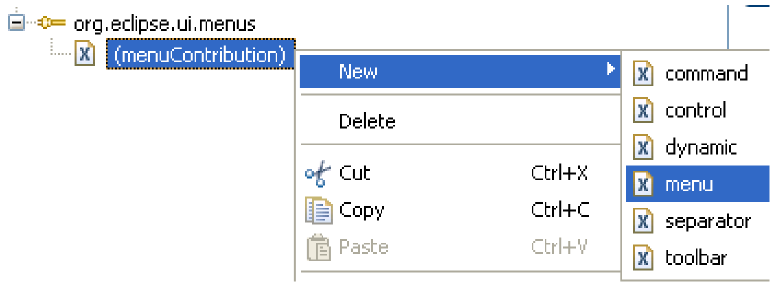
Create a new menu contribution with the "menu:org.eclipse.ui.main.menu" locationURI. Make sure this URL is correct spelled, otherwise your menu will not be shown.

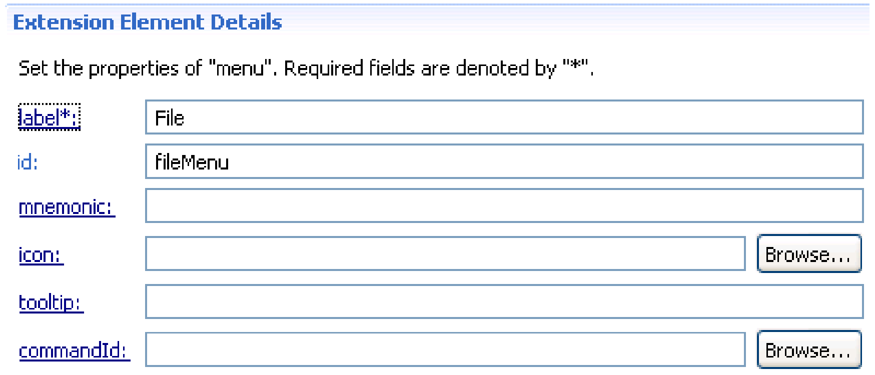

Extension Element Details

Set the properties of "menuContribution". Required fields are denoted by "*".

locationURI*:	menu:org.eclipse.ui.main.menu
class:	
allPopups:	false

Right-click your menucontribution and select *New → Menu*. Add a menu with the "File" label and the "fileMenu" ID.

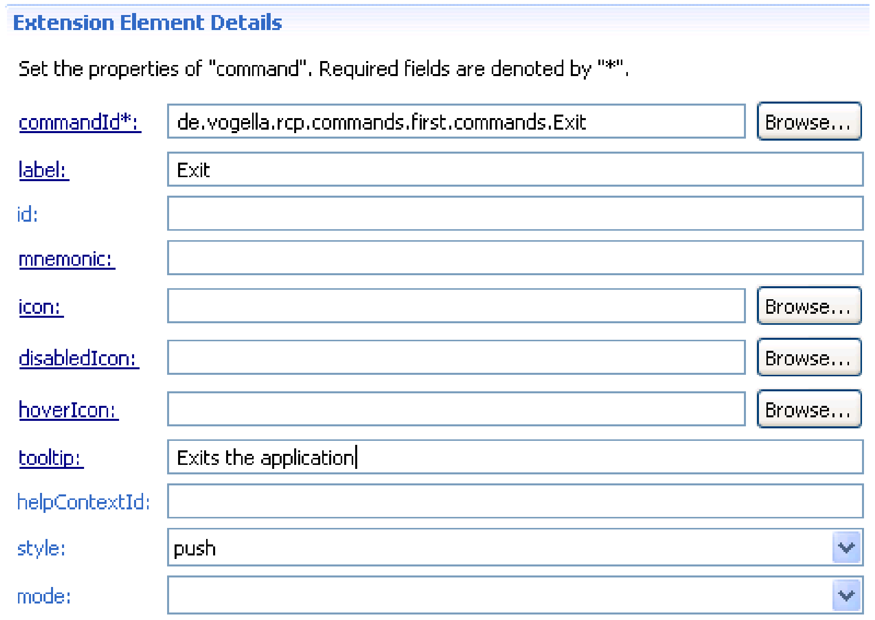



Extension Element Details

Set the properties of "menu". Required fields are denoted by "*".

label*:	File
id:	fileMenu
mnemonic:	
icon:	
tooltip:	
commandId:	

Select your menu, right-click on it, select New-> Command. Maintain your commandID. Set the label to "Exit" and the tooltip to "Exits the application".


Extension Element Details

Set the properties of "command". Required fields are denoted by "*".

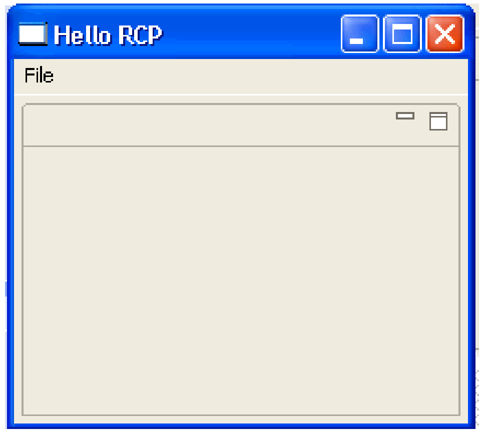
commandId*:	de.vogella.rcp.commands.first.commands.Exit
label:	Exit
id:	
mnemonic:	
icon:	
disabledIcon:	
hoverIcon:	
tooltip:	Exits the application
helpContextId:	
style:	push
mode:	

This should result in a *`plugin.xml`* file which looks like the following.

```
<?xml version="1.0" encoding="UTF-8"?>
<?eclipse version="3.4"?>
<plugin>

   <extension
```

```
            id="application"
            point="org.eclipse.core.runtime.applications">
         <application>
            <run
                  class="de.vogella.rcp.commands.first.Application">
            </run>
         </application>
      </extension>
      <extension
            point="org.eclipse.ui.perspectives">
         <perspective
               name="RCP Perspective"
               class="de.vogella.rcp.commands.first.Perspective"
               id="de.vogella.rcp.commands.first.perspective">
         </perspective>
      </extension>
      <extension
            point="org.eclipse.ui.commands">
         <command
               defaultHandler="de.vogella.rcp.commands.first.commands.ExitHandler
"
               id="de.vogella.rcp.commands.first.commands.Exit"
               name="Exit">
         </command>
      </extension>
      <extension
            point="org.eclipse.ui.menus">
         <menuContribution
               locationURI="menu:org.eclipse.ui.main.menu">
            <menu
                  id="fileMenu"
                  label="File">
               <command
                     commandId="de.vogella.rcp.commands.first.commands.Exit"
                     label="Exit"
                     style="push"
                     tooltip="Exit the application">
               </command>
            </menu>
         </menuContribution>
      </extension>

</plugin>
```

Run the example. You should see menu with the file and if you select the "Exit" entry you application should exit.



8. Tutorial: Commands and toolbars

8.1. Overview

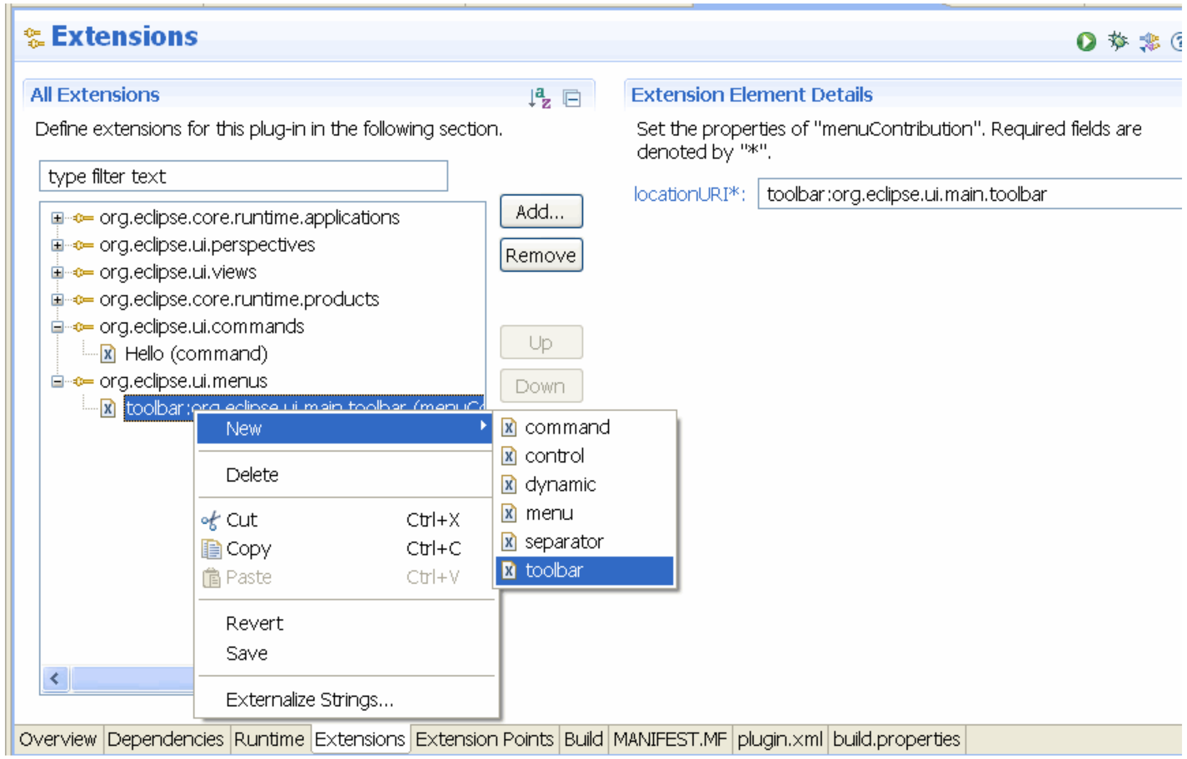
You can add commands to the application toolbar and to a view toolbar.

8.2. Application toolbar (coolbar)

Create a new project "de.vogella.rcp.intro.commands.toolbar". Use the "RCP application with a view" as a template. Create a command "de.vogella.rcp.intro.commands.toolbar.Hello" with the default handler "de.vogella.rcp.intro.commands.toolbar.handler.Hello". This handler will open a **JFace Dialog**.

```
package de.vogella.rcp.intro.commands.toolbar.handler;

import org.eclipse.core.commands.AbstractHandler;
import org.eclipse.core.commands.ExecutionEvent;
import org.eclipse.core.commands.ExecutionException;
import org.eclipse.jface.dialogs.MessageDialog;
import org.eclipse.ui.handlers.HandlerUtil;

public class Hello extends AbstractHandler {

  @Override
  public Object execute(ExecutionEvent event) throws ExecutionException {
    MessageDialog.openInformation(HandlerUtil.getActiveWorkbenchWindow(event).
getShell(), "Info", "Info for you");
    return null;
  }

}
```

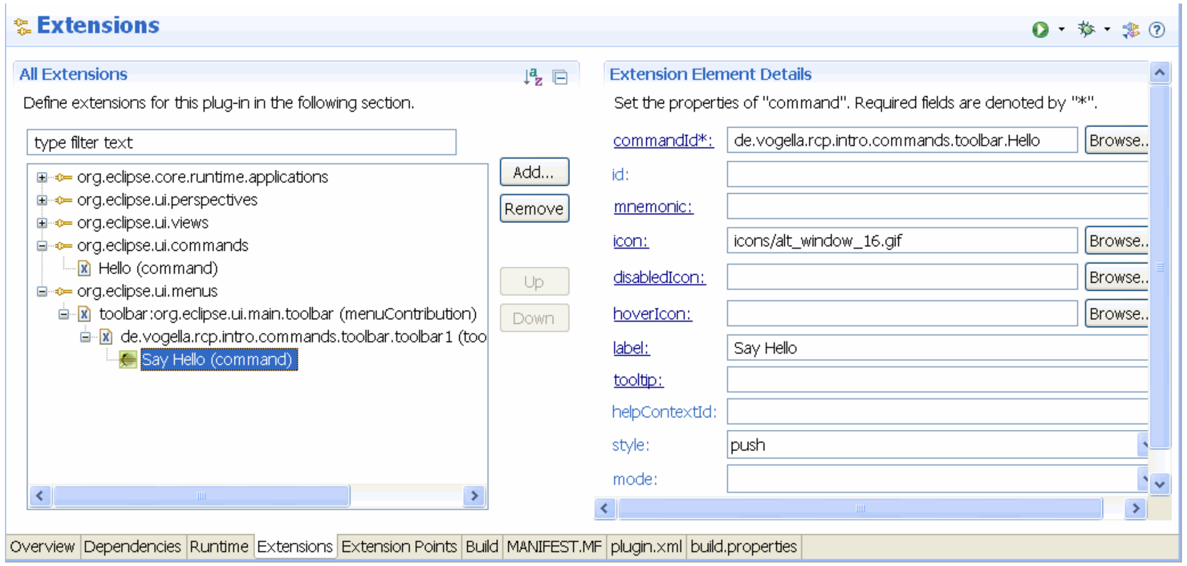
Add a menucontribution to the "org.eclipse.ui.menus extension" point. Set the location URI to "toolbar:org.eclipse.ui.main.toolbar". Add a toolbar to your menu contribution.



Set the properties of "menuContribution". Required fields are denoted by "*".

locationURI*: toolbar:org.eclipse.ui.main.toolbar

Add the command "de.vogella.rcp.intro.commands.toolbar.Hello" to the toolbar. Assign a label and an icon to it.


Extensions

All Extensions

Define extensions for this plug-in in the following section.

type filter text

```
org.eclipse.core.runtime.applications
org.eclipse.ui.perspectives
org.eclipse.ui.views
org.eclipse.ui.commands
  Hello (command)
org.eclipse.ui.menus
  toolbar:org.eclipse.ui.main.toolbar (menuContribution)
    de.vogella.rcp.intro.commands.toolbar.toolbar1 (too
      Say Hello (command)
```

Extension Element Details

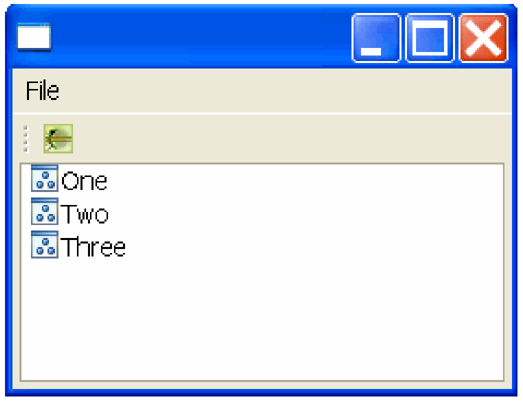
Set the properties of "command". Required fields are denoted by "*".

commandId*:	de.vogella.rcp.intro.commands.toolbar.Hello
id:	
mnemonic:	
icon:	icons/alt_window_16.gif
disabledIcon:	
hoverIcon:	
label:	Say Hello
tooltip:	
helpContextId:	
style:	push
mode:	

Activate the application toolbar via ApplicationWorkbenchWindowAdvisor.java and set the configurer.setShowCoolBar(true); (

```
package de.vogella.rcp.intro.commands.toolbar;

import org.eclipse.swt.graphics.Point;
import org.eclipse.ui.application.ActionBarAdvisor;
import org.eclipse.ui.application.IActionBarConfigurer;
import org.eclipse.ui.application.IWorkbenchWindowConfigurer;
import org.eclipse.ui.application.WorkbenchWindowAdvisor;

public class ApplicationWorkbenchWindowAdvisor extends WorkbenchWindowAdvisor
{

  public ApplicationWorkbenchWindowAdvisor(IWorkbenchWindowConfigurer configur
er) {
    super(configurer);
  }

  public ActionBarAdvisor createActionBarAdvisor(IActionBarConfigurer configur
er) {
    return new ApplicationActionBarAdvisor(configurer);
  }

  public void preWindowOpen() {
    IWorkbenchWindowConfigurer configurer = getWindowConfigurer();
    configurer.setInitialSize(new Point(400, 300));
    configurer.setShowStatusLine(false);
    configurer.setShowCoolBar(true);
    configurer.setTitle("RCP Application");
  }
}
```

The result should look like the following. If you select the element in the toolbar an information dialog should open.



8.3. Contribution to the View Toolbar

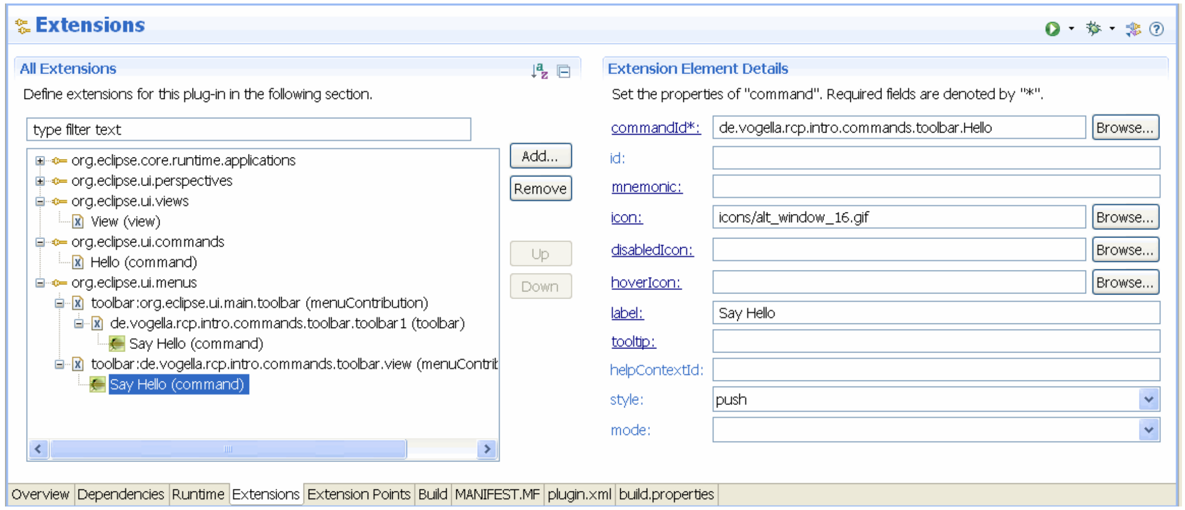
You can also add a command directly to a view toolbar. For this we will extend the previous example. Change the class "Perspective" to the following (a stand-alone view does not have a own toolbar).

```
package de.vogella.rcp.intro.commands.toolbar;

import org.eclipse.ui.IPageLayout;
import org.eclipse.ui.IPerspectiveFactory;

public class Perspective implements IPerspectiveFactory {

  public void createInitialLayout(IPageLayout layout) {
    String editorArea = layout.getEditorArea();
    layout.setEditorAreaVisible(false);
    layout.setFixed(true);
```

```
      layout.addView(View.ID, IPageLayout.LEFT, 1.0f, editorArea);
    }

  }
```

Create a new menu contribution to the extension point "org.eclipse.ui.menus" with the locationURI: "toolbar:de.vogella.rcp.intro.commands.toolbar.view". ""toolbar:"" tells the system to add it to the toolbar while the second argument is the id of your view.

Create then a new command for this menucontribution and set the command id to "de.vogella.rcp.intro.commands.toolbar.Hello". Assign the label "Say Hello" to it.


Extensions

All Extensions

Define extensions for this plug-in in the following section.

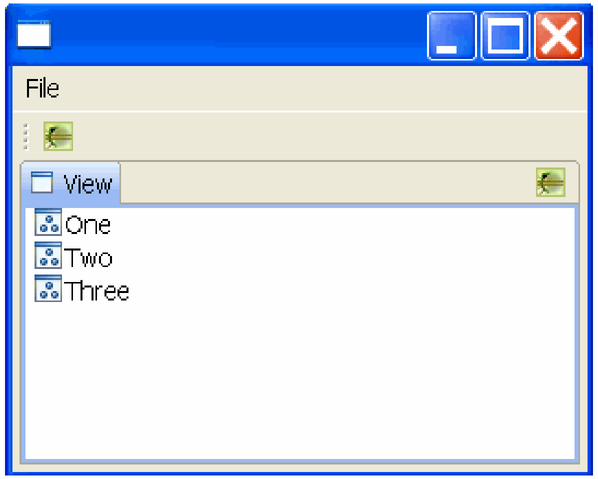
```
org.eclipse.core.runtime.applications
org.eclipse.ui.perspectives
org.eclipse.ui.views
  View (view)
org.eclipse.ui.commands
  Hello (command)
org.eclipse.ui.menus
  toolbar:org.eclipse.ui.main.toolbar (menuContribution)
    de.vogella.rcp.intro.commands.toolbar.toolbar1 (toolbar)
      Say Hello (command)
  toolbar:de.vogella.rcp.intro.commands.toolbar.view (menuContrib
    Say Hello (command)
```

Extension Element Details

Set the properties of "command". Required fields are denoted by "*".

commandId*:	de.vogella.rcp.intro.commands.toolbar.Hello
id:	
mnemonic:	
icon:	icons/alt_window_16.gif
disabledIcon:	
hoverIcon:	
label:	Say Hello
tooltip:	
helpContextId:	
style:	push
mode:	

Run the application to see your new view contribution.

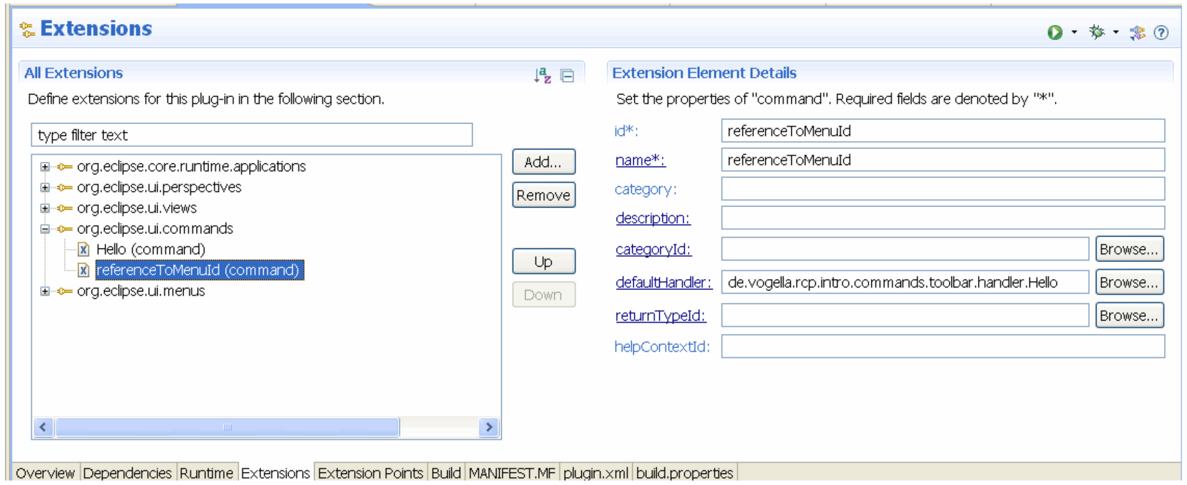


8.4. Drop down list

The following adds a dropdown list to the application coolbar.

This creation is a bit strange. You create a helper drop-down command to which later the other (real) commands will be assigned to.

Therefore create a command with the id "referenceToMenuId". Maintain also the default handler. For example you could reuse "de.vogella.rcp.intro.commands.toolbar.handler.Hello".



Extensions

All Extensions

Define extensions for this plug-in in the following section.

type filter text

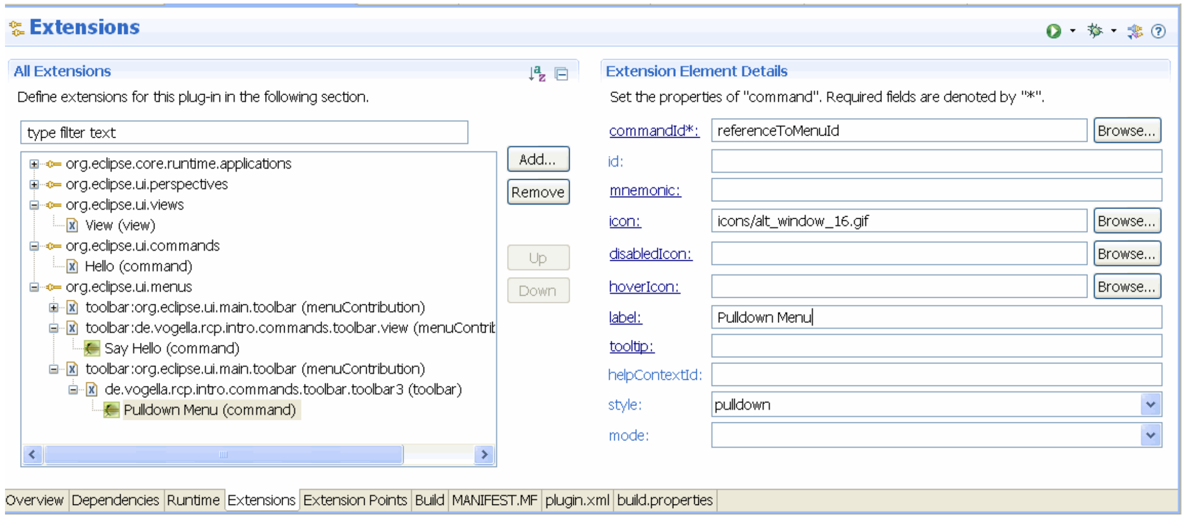
- org.eclipse.core.runtime.applications
- org.eclipse.ui.perspectives
- org.eclipse.ui.views
- org.eclipse.ui.commands
  - Hello (command)
  - referenceToMenuId (command)
- org.eclipse.ui.menus

Extension Element Details

Set the properties of "command". Required fields are denoted by "*".

id*:	referenceToMenuId
name*:	referenceToMenuId
category:	
description:	
categoryId:	
defaultHandler:	de.vogella.rcp.intro.commands.toolbar.handler.Hello
returnTypeId:	
helpContextId:	

Add a new menucontribution to the "org.eclipse.ui.menus" extension point. Set the location URI to "toolbar:org.eclipse.ui.main.toolbar". Add a toolbar to this extension and a new command to this new toolbar. As the id use "referenceToMenuId" give it a label and an icon and change the style to "pulldown".


Extensions

All Extensions

Define extensions for this plug-in in the following section.

- org.eclipse.core.runtime.applications
- org.eclipse.ui.perspectives
- org.eclipse.ui.views
  - View (view)
- org.eclipse.ui.commands
  - Hello (command)
- org.eclipse.ui.menus
  - toolbar:org.eclipse.ui.main.toolbar (menuContribution)
  - toolbar:de.vogella.rcp.intro.commands.toolbar.view (menuContrit
    - Say Hello (command)
  - toolbar:org.eclipse.ui.main.toolbar (menuContribution)
    - de.vogella.rcp.intro.commands.toolbar.toolbar3 (toolbar)
      - Pulldown Menu (command)

Extension Element Details

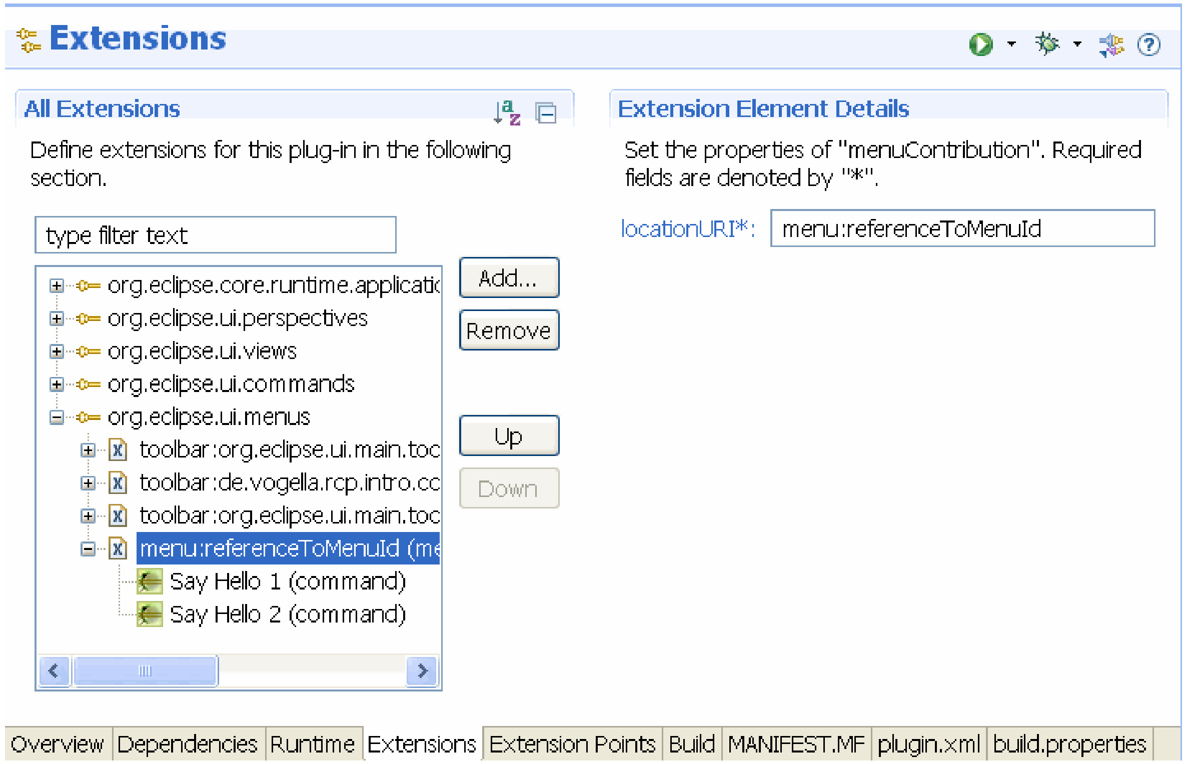
Set the properties of "command". Required fields are denoted by "*".

commandId*:	referenceToMenuId
id:	
mnemonic:	
icon:	icons/alt_window_16.gif
disabledIcon:	
hoverIcon:	
label:	Pulldown Menu
tooltip:	
helpContextId:	
style:	pulldown
mode:	

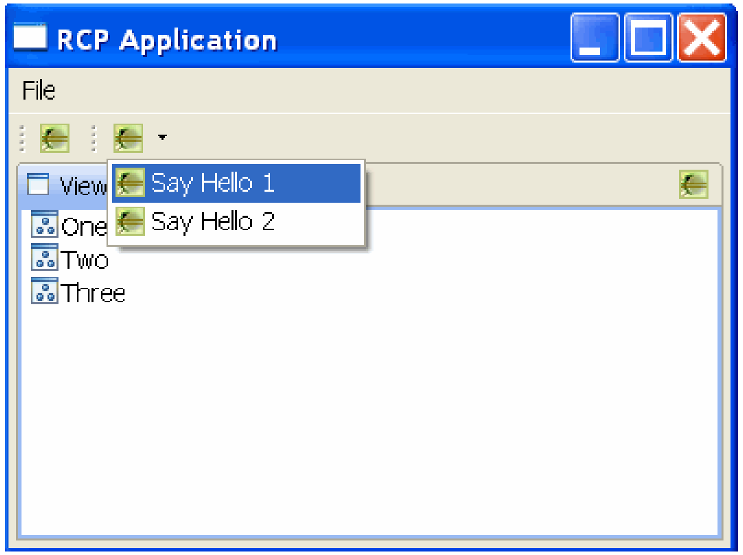
Create a new menucontribution and set the locationURI to: "menu:referenceToMenuId"

Tip:referenceToMenuId is the ID we used earlier in the command.

Add your exiting command "de.vogella.rcp.intro.commands.toolbar.Hello" two times to this menu. Use different labels.


Extensions
All Extensions
Define extensions for this plug-in in the following section.
type filter text
org.eclipse.core.runtime.applicati
org.eclipse.ui.perspectives
org.eclipse.ui.views
org.eclipse.ui.commands
org.eclipse.ui.menus
toolbar:org.eclipse.ui.main.toc
toolbar:de.vogella.rcp.intro.cc
toolbar:org.eclipse.ui.main.toc
menu:referenceToMenuId (me
Say Hello 1 (command)
Say Hello 2 (command)
Add...
Remove
Up
Down
Extension Element Details
Set the properties of "menuContribution". Required fields are denoted by "*".
locationURI*: menu:referenceToMenuId
Overview
Dependencies
Runtime
Extensions
Extension Points
Build
MANIFEST.MF
plugin.xml
build.properties

Run your application, it should now have a drop-down list in the application toolbar.



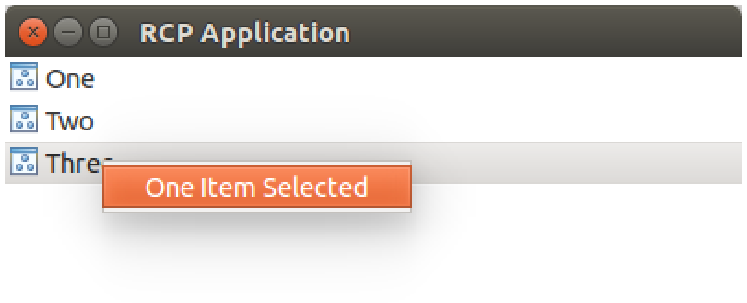
Tip: Add the command "referenceToMenuId" to your exiting view toolbar contribution to get the drop-down menu also in your view.

9. Tutorial: Commands and context menus

In this example you add a context menu to a SWT table widget. Create a new project "de.vogella.rcp.intro.commands.popup" based on the "RCP application with a view" example.

Create a new command with the `de.vogella.rcp.intro.commands.popup.showSelected` ID and the name *Show*.

In this example we will not use the default handler. Therefore add the `org.eclipse.ui.handlers` extension point to your plugin.xml file and add a handler. The first parameter is the commandId and the second the class for the handler. Use `de.vogella.rcp.intro.commands.popup.handler.ShowSelected` as class name.



Implement now the code for your handler. I just print the selected elements to the console.

```
package de.vogella.rcp.intro.commands.popup.handler;

import java.util.Iterator;
import org.eclipse.core.commands.AbstractHandler;
import org.eclipse.core.commands.ExecutionEvent;
import org.eclipse.core.commands.ExecutionException;
import org.eclipse.jface.viewers.ISelection;
import org.eclipse.jface.viewers.IStructuredSelection;
import org.eclipse.ui.handlers.HandlerUtil;

public class ShowSelected extends AbstractHandler {

  @SuppressWarnings("unchecked")
  @Override
  public Object execute(ExecutionEvent event) throws ExecutionException {
    ISelection selection = HandlerUtil.getActiveWorkbenchWindow(event)
        .getActivePage().getSelection();
    if (selection != null & selection instanceof IStructuredSelection) {
      IStructuredSelection strucSelection = (IStructuredSelection) selection;
      for (Iterator<Object> iterator = strucSelection.iterator(); iterator
          .hasNext();) {
        Object element = iterator.next();
        System.out.println(element.toString());
      }
    }
    return null;
  }

}
```

Add a new menuContribution with the locationURI "popup:de.vogella.rcp.intro.commands.popup.view", where "de.vogella.rcp.intro.commands.popup.view" is the ID of your view which has been automatically created for you.

Right-click your new menuContribution and select New -> Command. Assign your command to the field "commandId". Label it "One Item selected".

Now you have add a MenuManager to your view. Select the `View` class and change it to the following.

```
package de.vogella.rcp.intro.commands.popup;

import java.util.ArrayList;
import java.util.List;

import org.eclipse.jface.action.MenuManager;
import org.eclipse.jface.viewers.ArrayContentProvider;
import org.eclipse.jface.viewers.LabelProvider;
import org.eclipse.jface.viewers.TableViewer;
import org.eclipse.swt.SWT;
import org.eclipse.swt.graphics.Image;
import org.eclipse.swt.widgets.Composite;
import org.eclipse.swt.widgets.Menu;
import org.eclipse.ui.ISharedImages;
import org.eclipse.ui.PlatformUI;
import org.eclipse.ui.part.ViewPart;

public class View extends ViewPart {

  private TableViewer viewer;

  class ViewLabelProvider extends LabelProvider {
    @Override
    public Image getImage(Object obj) {
      return PlatformUI.getWorkbench().getSharedImages().getImage(ISharedImage
s.IMG_OBJ_ELEMENT);
    }
  }

  @Override
  public void createPartControl(Composite parent) {
    viewer = new TableViewer(parent, SWT.MULTI | SWT.H_SCROLL | SWT.V_SCROLL);
    viewer.setContentProvider(ArrayContentProvider.getInstance());
    viewer.setLabelProvider(new ViewLabelProvider());

    viewer.setInput(getData());
    // Create a menu manager and create context menu
    MenuManager menuManager = new MenuManager();
    Menu menu = menuManager.createContextMenu(viewer.getTable());
    // set the menu on the SWT widget
    viewer.getTable().setMenu(menu);
    // register the menu with the framework
    getSite().registerContextMenu(menuManager, viewer);

    // make the viewer selection available
    getSite().setSelectionProvider(viewer);
  }
/**
   * Passing the focus request to the viewer's control.
   */

  @Override
  public void setFocus() {
    viewer.getControl().setFocus();
  }

  private List<String> getData() {
    List<String> list = new ArrayList<String>();
    list.add("One");
    list.add("Two");
    list.add("Three");
    return list;
  }
}
```

Run your application. If you perform a right-click on the table, your menu should become visible. If you select it menu then the names of the selected items should be written to the console.

10. Advanced Commands

For more advanced usages of Eclipse Commands please see **Eclipse Commands Advanced**.

11. About this website

12. Links and Literature

12.1. Eclipse Commands Resources

Eclipse Commands Advanced

Key bindings for Commands

http://wiki.eclipse.org/Platform_Command_Framework Command Framework wiki

http://wiki.eclipse.org/Command_Core_Expressions Commands Core Expressions

12.2. vogella GmbH training and consulting support