0.1 Hello World Assembly

This tutorial is based on the CUTS HelloWorld example that can be found at $CUTS_ROOT/examples/iccm/HelloWorld/models/HelloWorld.xme. The aim of this tutorial is to show that the assembly of components can be structured into multiple layered assemblies. This current example will compile and run but not exchange messages between assemblies. This problem will be logged on the CUTS redmine site for future investigation.

0.1.1 HelloWorld application architecture

This HelloWorld example contains two components, a Sender and a Receiver. The Sender sends a MessageEvent to the Receiver which outputs the message received. The message is set in the AssemblyProperties aspect of the Assembly. The following shows both Packaging and Assembly Properties for the original HelloWorld application.

![HelloWorld Component Assembly](image)

0.1.2 Adding new Component Assembly Parts

To create multiple assemblies open the top level HelloWorld_asm ComponentImplementation-Container under the ComponentImplementations folder from the GME Browser. Drag and drop three Component Assembly parts from the Part Browser to the main panel, and name them Assembly_asm, Sender_asm, and Receiver_asm. The HelloWorld_asm is the original assembly of components. Now we are creating an assembly of assemblies using these three new Component Assembly parts.

![HelloWorld Assemblies](image)

Double click on the Sender_asm, and drag a ComponentInstance Part onto the main panel and select the HelloSenderImpl model element from the list. Also select and drag an OutEventPort-Delegate from the Part Browser to the main panel. Rename the ComponentInstance to SenderEx and link the greeting OutEventPort to the OutEventPortDelegate.
Hello World Sender Assembly

Also go to the AssemblyProperties aspect to add a SimpleProperty and link it to the message attribute of the component. Give the message a value for example **Hello, Ex World!**. The Receiver_asm can be set up in a similar manner, using the InEventPortDelegate part to link to the greeting InEventPort of the HelloReceiverImpl instance.

Hello World Receiver Assembly

0.1.3 Creating an Instance of an Assembly

The Sender_asm and Receiver_asm can be connected together by creating an instance of each assembly. Open the top level HelloWorld_asm ComponentImplementationContainer, right click on the Sender_asm and select Copy. Then open the Assembly_asm, right click on the main panel and select *Paste Special > As Instance*. Do the same for the Receiver_asm and connect the OutEventPortDelegate of the Sender_asm to the InEventPortDelegate of the Receiver_asm.

Hello World Assembly_asm

0.1.4 Deployment Plan

This method uses the GME to define a deployment plan. Ensure that the target domain nodes have been setup in the Targets folder, then add the target node to a deployment within the DeploymentPlans folder. Refer to the [HelloCUTS tutorial](#) for more detailed description of how to setup the target nodes for deployment.

Deployment of components within an assembly may be done in one of two ways, either by using a ComponentAssemblyReference or by using ComponentInstanceRef parts for each component. For the first option go to the HelloWorld DeploymentPlan in the DeploymentPlans folder. Select and drag the ComponentAssemblyReference from the Part Browser to the main window and then drag a ComponentAssembly (ie the Sender_asm) from the GME Browser over that reference part. Rename the element as **Sender_asm_ref**. Use the Set Mode tool from the left tool bar, and right click on the DefaultGroup, then left click on the Sender_asm_ref. This will deploy all components within the Sender_asm assembly on the chosen node group. Use similar steps to deploy the Receiver_asm.
Hello World Deployment first option

If the components within an assembly are to be deployed over different nodes, the second option must be used. Go to the Hello World Deployment Plan in the Deployment Plans folder. Select and drag the ComponentInstanceRef from the Part Browser to the main window and then drag a ComponentInstance (ie the SenderEx) that is within the assembly from the GME Browser over that reference part. Repeat the above process for each component in the assembly, then use the Set Mode tool to join the components to a node group as before.

Hello World Deployment second option

0.1.5 Model execution

This model may be run in the same way as the other tutorials. Refer to the [HelloCUTS tutorial](http://redmine.cs.iupui.edu/projects/cuts/wiki) for more details on how to generate code, build and execute using the CUTS runtime.

0.1.6 Further Reading