

# Tutorial (Lab5): Creating a Custom IP Block in Vivado

In this week, you will learn how to create an IP block and to use it as a component in a bigger circuit.

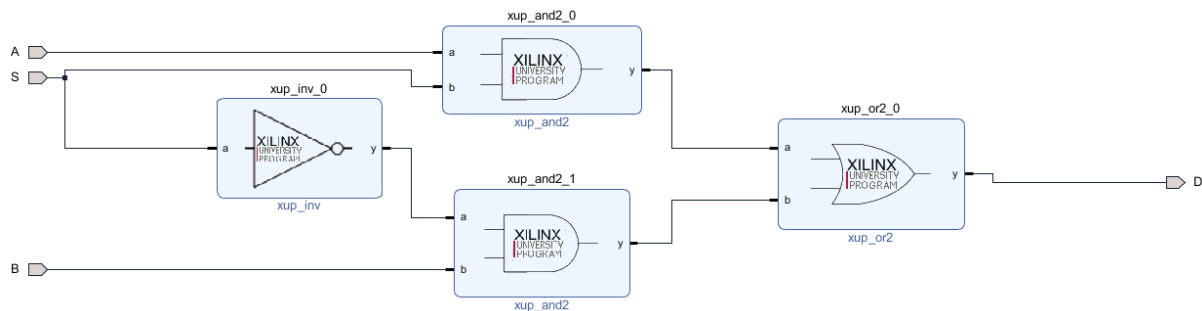
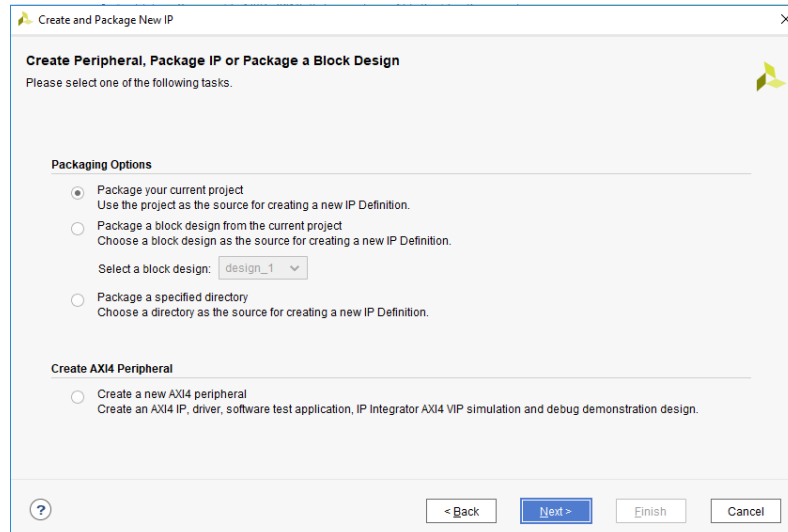


Figure 1 A circuit schematic diagram for an IP creation.

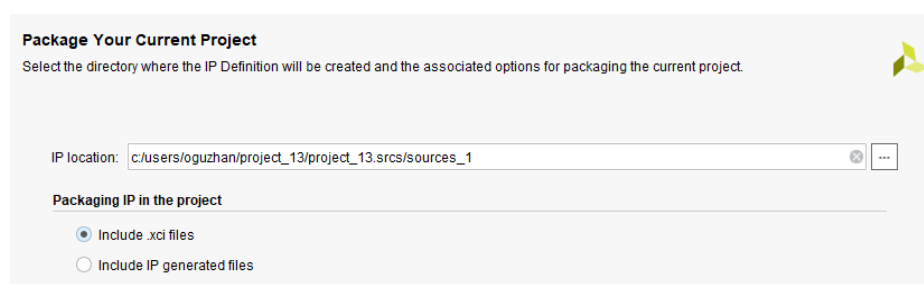
We will create an IP from a circuit in Figure 1. Although creating such a circuit in Vivado is a relatively simple task, if the same circuit is used in a bigger circuit many times as a basic block, it makes it very efficient to create an IP out of it, and to call the IP at the bigger circuit.

Step 1) Create a circuit of Figure 1, and its VHDL wrapper.

Step 2) Under **Tools**, choose **Create** and **Package New IP**.



Step 3)



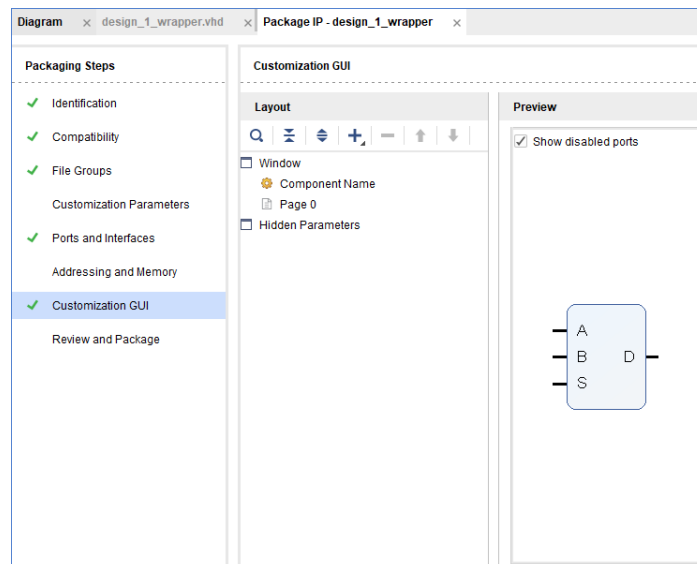
Step 4) Rename the IP and add some explanations. Make a note of the location of the IP.

The screenshot shows the 'Package IP - design\_1\_wrapper' window with the 'Identification' step selected in the 'Packaging Steps' sidebar. The 'Identification' section contains the following fields:

- Vendor: AGU
- Library: user
- Name: sampleIP\_1
- Version: 1.0
- Display name: ee203\_sampleIP
- Description: lab4 tutorial example
- Vendor display name: (empty)
- Company url: (empty)
- Root directory: c:/users/oguzhan/project\_13/project\_13.srcs/sources\_1
- Xml file name: c:/users/oguzhan/project\_13/project\_13.srcs/sources\_1/component.xml

Below these fields is a 'Categories' section with a list containing '/UserIP'.

Step 5) Now, you can see the preview of the IP.



Step 6) Under the **Review and Package**, click on **Package**.

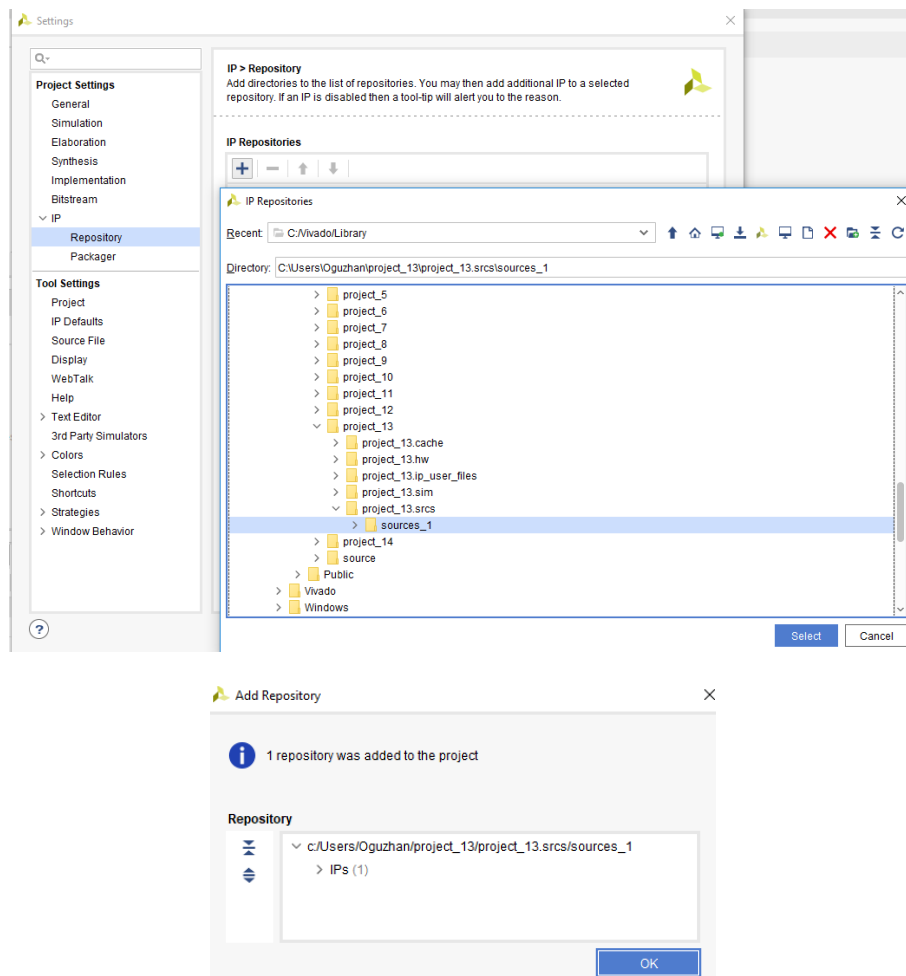
The screenshot shows the 'Package IP - design\_1\_wrapper' window with the 'Review and Package' step selected in the 'Packaging Steps' sidebar. The 'Review and Package' section contains the following information:

- Summary:**
  - Display name: ee203\_sampleIP
  - Description: lab4 tutorial example
  - Root directory: c:/users/oguzhan/project\_13/project\_13.srcs/sources\_1
- Edit IP Project Changes:** Includes a link 'Merge project changes to File Groups Wizard' and a 'Merge changes' button.
- After Packaging:** Contains a message: 'An archive will not be generated. Use the settings link below to change your preference. IP will be made available in the catalog using the repository - c:/users/oguzhan/project\_13/project\_13.srcs/sources\_1'. Below this is a link 'Edit packaging settings'.

A dialog box titled 'Package IP' is overlaid on the window, displaying the message: 'Finished packaging 'ee203\_sampleIP' successfully' with an 'OK' button.

At the bottom of the window is a 'Re-Package IP' button.

Step 7) Create a new project. Add the new IP to the IP repositories. Add XUP libraries as well, if you have not done it yet.



Step 8) Now, you can use the new IP to create a more complicated circuit as given below.

