

Boson NetSim: Can it be used in a classroom?

Can [Boson NetSim](#) be used in a classroom? You bet! You can create the components needed in lab packs so that you can deliver customized labs in the classroom or as homework for students.

One of the nice things about NetSim is the Lab Compiler feature, which allows you to create custom labs and custom lab packs. NetSim allows instructors to deliver customized labs that can be used in the classroom or as homework for students. Let's explore the five steps needed to create a custom lab and lab pack.

The five steps used to create a lab pack are the following:

1. [Create the Lab Document](#) – a required document that describes the steps that should be performed in the lab
2. [Create the Topology File](#) – a required file that defines the devices that will be used in the simulated network in the lab
3. [Create the Loading Configuration Files](#) – optional running configuration files that can be as detailed or sparse as you wish
4. [Create the Grading Configuration Files](#) – optional completed configuration files that contain the commands that the student was required to complete in the lab
5. [Combine the files with the Lab Compiler](#) – used to combine all the pieces you created in the first four steps and export the compiled lab pack

In the following steps, we will create the files used in a lab. You can download sample completed files [here](#).

You will need 2 things (and can use all of the following 4) to create a custom lab:

1. [Lab Document](#) – Describes the steps that should be performed in the lab. The document must be in XPS format in NetSim 8. You can create this document in any format you wish and then “print” it using an XPS printer to get the correct format.
2. [Topology File](#) – Defines the devices that will be used in the simulated network in the lab. You can create a custom topology in NetSim 8 using the tools on the **NetMap** tab. When you have completed adding the devices and connections you desire, you should save the topology to a folder you will use for the lab. The file will be saved with a .top extension.
3. [Loading Configuration Files \(optional\)](#) – Starting running configuration files that can be as detailed or as sparse as you wish.
4. [Grading Configuration Files \(optional\)](#) – The final configurations on the devices after all steps in the lab document have been completed.

Step 1: Create the Lab Document

Everyone knows how to create a document, so I will not describe the steps here other than to give you a couple of things to think about. This document, named TestLab.xps, will end up in the lab pack created here.

1. Create a draft of the lab document first so that you have an outline of the tasks you want performed. This will also allow you to plan the network topology you want to simulate in the lab.
2. Add a graphic of the topology you created, and label the interfaces appropriately.
3. When appropriate, describe why a step is to be performed.
4. When you show device output in the document, use a different font such as Courier New so that it lines up correctly and is easier to read.
5. Boson NetSim requires XPS files for lab documents; save the original file as well as the XPS document so that it will be easier for you to make revisions later if needed.

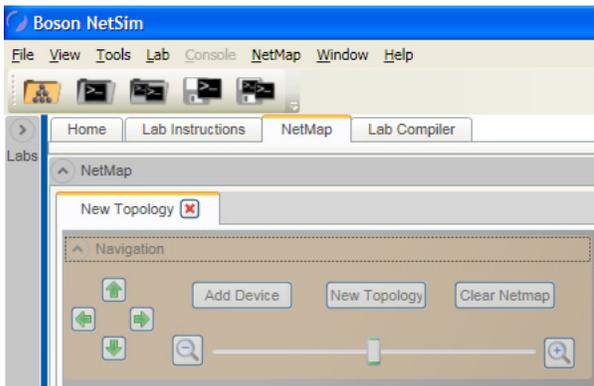
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Step 2: Create the Topology

1. Start NetSim 8, and click the **NetMap** tab.

In my document, I created a network design in MS Visio and pasted the graphic into the lab document. I will use this design to create the network topology that will be simulated in the lab.

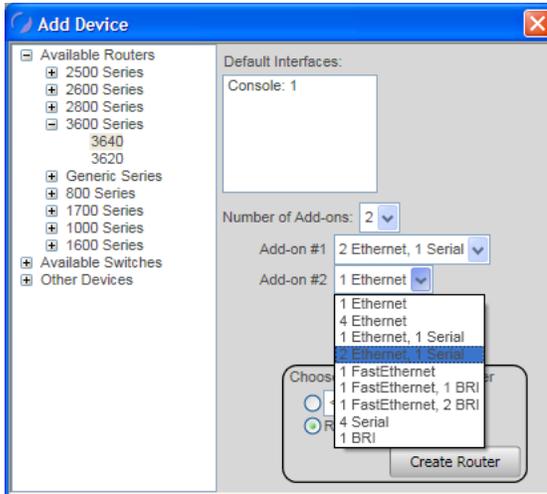
2. Click **Navigation** to view the options you will need to add devices to the topology.



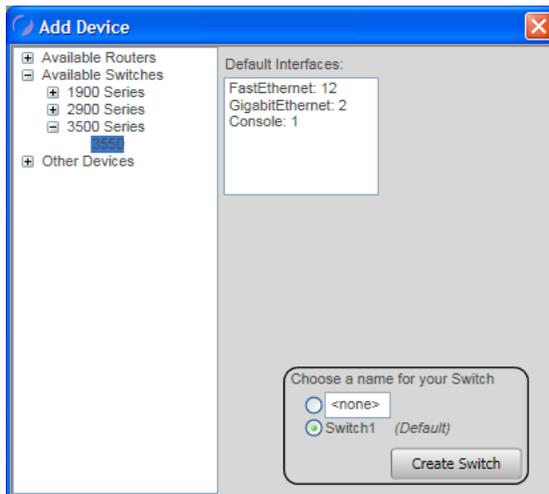
3. Click **Add Device**, and select **3640** from the list of available routers.
 - a. While the **Add Device** dialog box is open, select **2** in the **Number of Add-ons** field.

- b. Select **2 Ethernet, 1 Serial** as the connection types in the **Add-on #1** and **Add-on #2** options.

We won't use all of these connections since we are only making a simple topology.

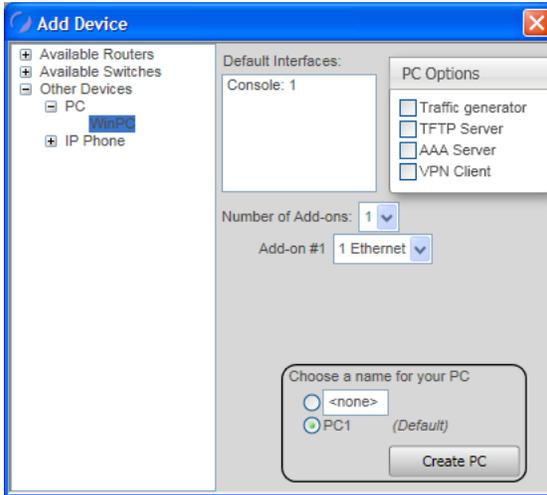


- c. Configure a custom name if you wish in the **Choose a name for your Router** field, or just click **Create Router** to add the device with the default **Router1** as the name of the device.
 - d. Click **Create Router**.
 - e. Repeat steps 3, 3a, 3b, 3c, and 3d to create a second router, **Router2**.
4. Click **Add Device**, and select **3550** from the list of available switches.



- a. Click **Create Switch** to create **Switch1**, which is the default name for the device.
- b. Repeat steps 4 and 4a to create **Switch2**.

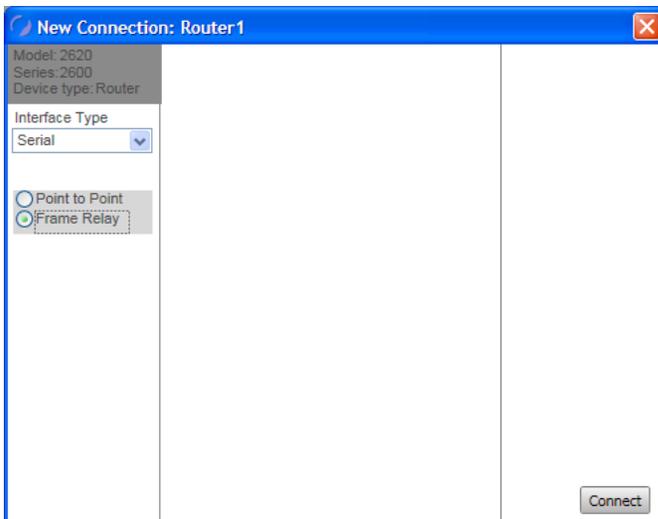
5. Click **Add Device**, and select **PC > WinPC** from the list of **Other Devices**.



- a. Click **Create PC** to add **PC1**, which is the default name for the device.
- b. Repeat steps 5 and 5a to create **PC2**.

Now that the devices have been added to the topology, we need to connect them together. Routers can be connected together using Serial or Ethernet connections. However, in this example we will connect them using Frame Relay. Let's begin by connecting the routers to each other, followed by adding connections to the other devices in the topology.

1. Right-click **Router1**, and select **New Connection 1**
2. In the **New Connection** dialog box, select **Frame Relay** and click **Connect**.



3. Select **Router1** in the **1st Router** drop-down list and Router1's **Serial0/0** interface in the **Interface** drop-down list. Then assign **201** in the **DLCI Destination** field.

Name: [Redacted]

Number of Nodes: 2

From:	To:
1st Router: Router1 Interface: Serial0/0	DLCI Destination 201
2nd Router: Router1	DLCI Destination Router1

4. In the **Name** field, enter **FR-1** to name the new device in the NetMap.
5. Select **Router2** in the **2nd Router** drop-down list and Router2's **Serial0/0** interface in the **Interface** drop-down list. Then assign **201** in the **DLCI Destination** field.

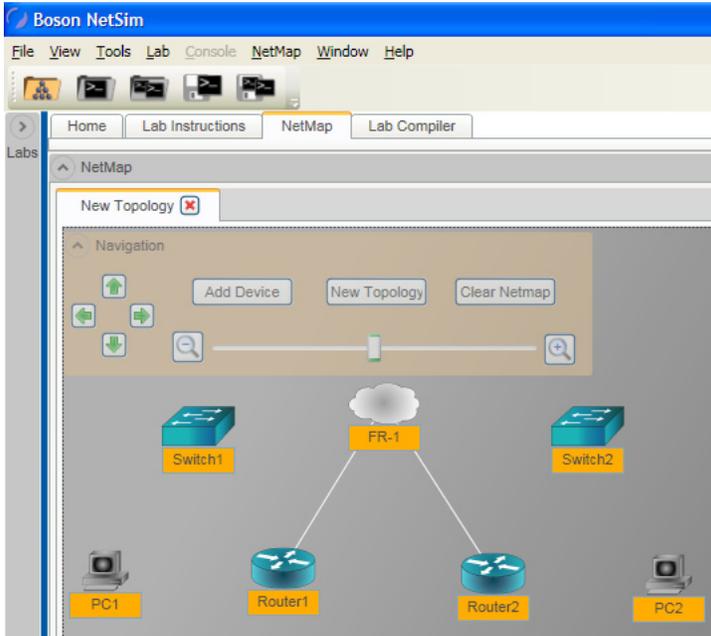
Name: FR-1

Number of Nodes: 2

From:	To:
1st Router: Router1 Interface: Serial0/0	DLCI Destination 201 Router2
2nd Router: Router2 Interface: Serial0/0	DLCI Destination 102 Router1

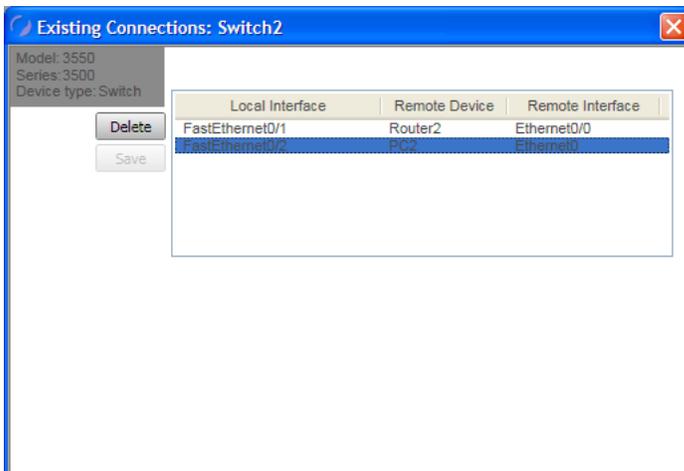
6. Click **Apply Settings** to create the new Frame Relay cloud named FR-1.

7. Move the devices in your topology around until it looks something like the graphic below:



Note: If you need to delete one of the links you create in the following steps, you should do the following:

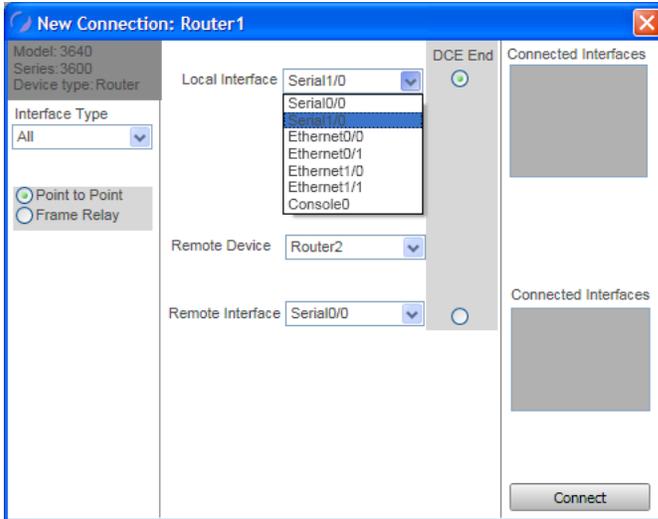
1. Right-click one of the devices on either end of the link you wish to delete, and select **Existing Connections**.
2. In the **Existing Connections** dialog box, select the interface on the device that is part of the link you wish to delete and click **Delete**.



Now let's add a serial link between Router1 and Router2 using the following steps:

1. Right-click **Router1**, and select **New Connection**.

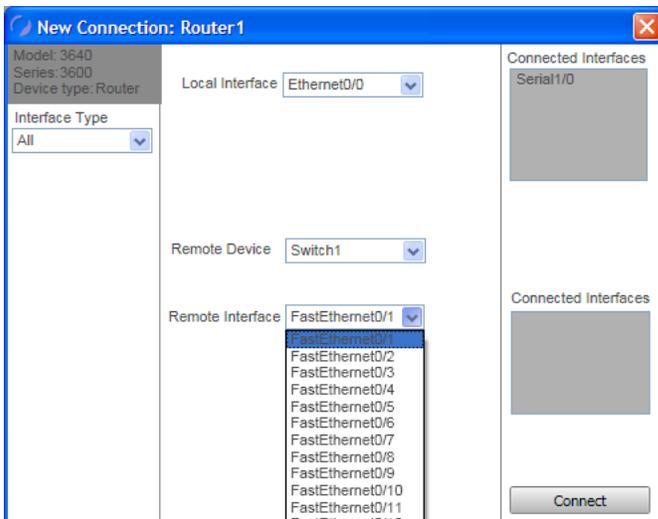
2. In the **New Connection** dialog box for Router1, select the **Serial1/0** interface in the **Local Interface** dropdown list.



3. Select **Router2** in the **Remote Device** drop-down list.
4. Select the **Serial1/0** interface in the **Remote Interface** drop-down list.
5. Leave the selection for the DCE end of the link set to Router1 as shown in the graphic above.
6. Click **Connect** to create the link.

Now let's add an Ethernet link between Router1 and Switch1.

1. Right-click **Router1**, and select **New Connection**.
2. In the **New Connection** dialog box, select **Ethernet0/0** in the **Local Interface** drop-down list.
3. Select **Switch1** in the **Remote Device** drop-down list.
4. Select **FastEthernet0/1** in the **Remote Interface** drop-down list.

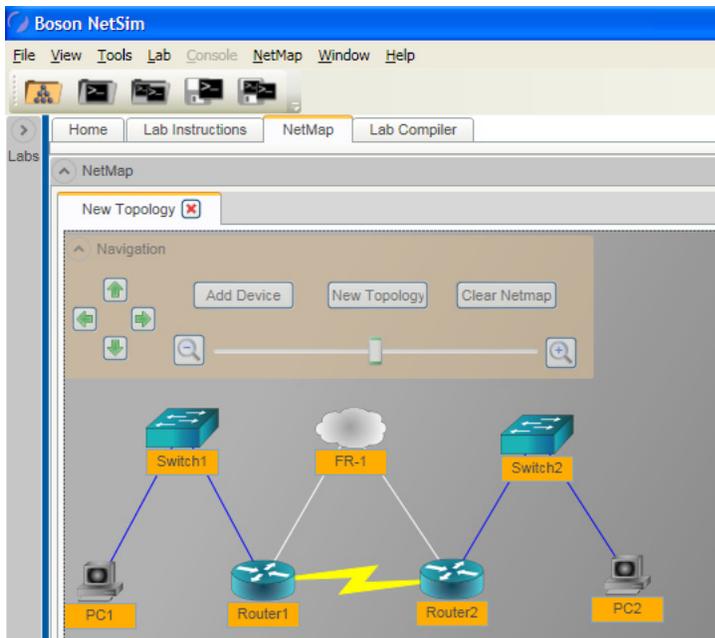


5. Click **Connect** to create the link between Router1 and Switch1.

Create the following remaining connections using the steps outlined above:

1. On Switch1, create a connection between Switch1's FastEthernet0/2 interface and PC1.
2. On Router2, create a connection between Router2's Ethernet0/0 interface and Switch2's FastEthernet0/1 interface.
3. On Switch2, create a connection between Switch2's FastEthernet0/2 interface and PC2.

Your final topology diagram should look similar to the one in the graphic below.



Now that you've created your topology diagram, you need to save it to the folder that will store all of the files for the lab you are creating.

1. Click **NetMap** on the Menu Bar, and select **Save Topology**.
2. Choose or create a folder on your Desktop named **TestLab**.
3. In the **File name** field, name the file **TestLab.top** and click **Save**.
4. You should receive a message that the file was saved. Click **OK**.

The topology file you just created could also be used in multiple labs. You would only need to copy the TestLab.top file to the folders of other labs you wish to create. This simplifies the process of creating labs because you can create a single topology file that can be used in multiple labs.

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Step 3: Create the Loading Configuration Files

At this point, you could create a lab using only the lab document and the topology file you just created. However, let's work through the steps needed to create loading configuration files. In our test lab, we are going to create loading configurations for Router1 and Switch1 that sets them to load with a host name set to their device name.

1. Click **NetMap** on the Menu Bar, and click **Apply Selected Topology**.
2. If you had another topology loaded in NetSim, click **Yes** when prompted.
3. In the console of Router1, enter the following commands to configure a host name of **Router1**:

```
Router>enable
Router#configure terminal
Router(config)#hostname Router1
```

4. Select **Switch1** from the **Devices** drop-down list.
5. In the console of Switch1, enter the following commands to configure a host name of **Switch1**:

```
Switch>enable
Switch#configure terminal
Switch(config)#hostname Switch1
```

Now we want to save our current configurations as loading configurations, so let's perform the following steps:

1. From the Menu Bar, click **Console** and then click **Save Multi-Device Config**.
2. In the **Save Multiple Device Configuration** dialog box, navigate to the **TestLab** folder you created earlier on your Desktop.
3. Type **Loading** in the **File name** field, and click **Save**.

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Step 4: Create the Grading Configuration Files

Now we have three of the four things that can be used in our test lab. Let's create the final piece, the grading configuration files. Remember that grading files are the running configuration that we want the user who follows our lab document to have when they finish working through our lab document. Our lab document has the user pinging between PC1 and Router1, so we need to configure some IP addresses on the devices and enable links.

In this example TestLab, the following are the commands the user should issue to enable a ping between PC1 and Router1.

On PC1:

```
C:>ipconfig /ip 192.168.100.2 255.255.255.0
C:>ipconfig /dg 192.168.100.1
```

On Switch1:

```
Switch1>enable
Switch1#configure terminal
Switch1(config)#ip default-gateway 192.168.100.1
```

On Router1:

```
Router1>enable
Router1#configure terminal
Router1(config)#interface ethernet 0/0
Router1(config-if)#ip address 192.168.100.1 255.255.255.0
Router1(config-if)#no shutdown
```

Finally, the user should issue a ping from PC1 to Router1 with a resulting successful ping.

On PC1:

```
C:>ping 192.168.100.1
Pinging 192.168.100.1 with 32 bytes of data:
Reply from 192.168.100.1: bytes=32 time=52ms TTL=241
Reply from 192.168.100.1: bytes=32 time=69ms TTL=241
Reply from 192.168.100.1: bytes=32 time=55ms TTL=241
Reply from 192.168.100.1: bytes=32 time=72ms TTL=241
Reply from 192.168.100.1: bytes=32 time=53ms TTL=241
Ping statistics for 192.168.100.1: Packets: Sent = 5, Received = 5, Lost
= 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 52ms, Maximum = 72ms, Average = 60ms
```

After you have issued the previous commands, you can save the running configurations on all of the devices so that you can use them as grading configurations; use the following steps.

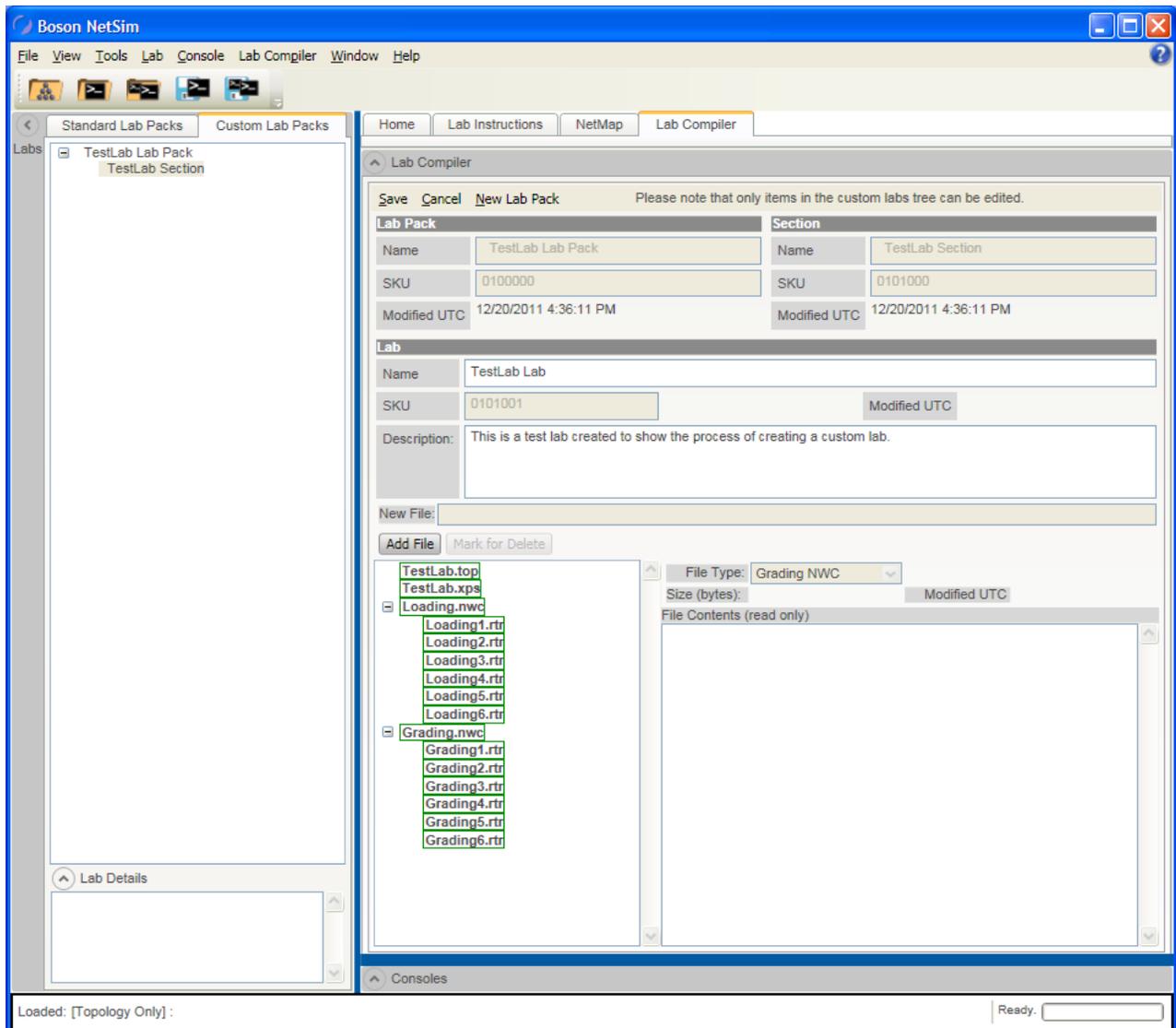
1. From the Menu Bar, click **Console** and then click **Save Multi-Device Config**.
2. In the **Save Multiple Device Configuration** dialog box, navigate to the **TestLab** folder you created earlier on your Desktop.
3. Type **Grading** in the **File name** field, and click **Save**.

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Step 5: Use the Lab Compiler to Create the Lab Pack

You've now created the required files (lab document and topology) and optional files (loading and grading configurations) needed for our lab, but you still have to create the lab file so you can share it with students. This section will detail how to use the Lab Compiler to create the lab and export it so that you can share it.

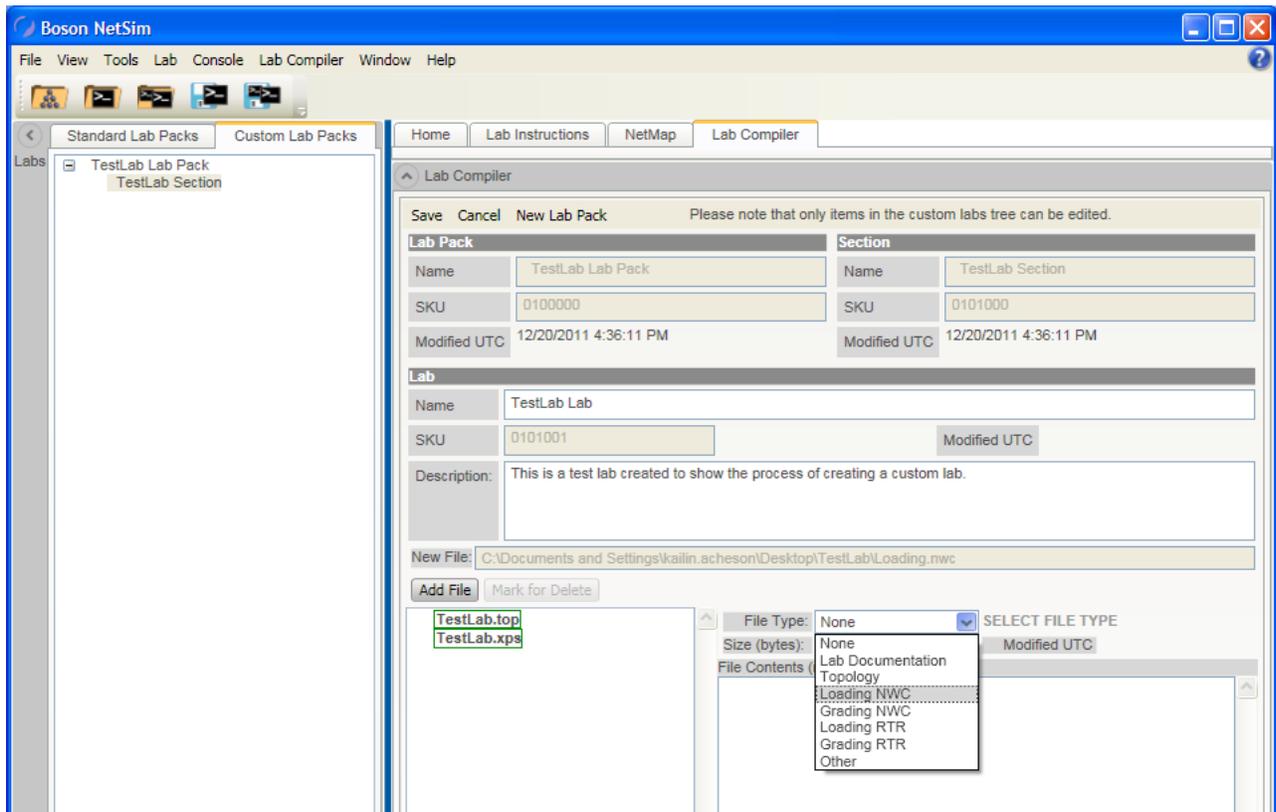
Click the **Lab Compiler** tab. Note that the **Custom Lab Packs** tab is also displayed. The Custom Lab Pack database is where your TestLab lab pack will be created and stored.



Perform the following steps to create the lab pack. The completed process is shown above just before the lab is saved.

1. On the Menu Bar, click **Lab Compiler** and then click **New Lab Pack**.
2. In the **Lab Pack Name** field, type **TestLab Lab Pack**.
3. Click **Save** and then **OK** when prompted.

4. On the **Custom Lab Packs** tab, right-click **TestLab Lab Pack** and select **Add New Section**.
5. In the **Section Name** field, enter **TestLab Section**.
6. Click **Save** and then **OK** when prompted.
7. On the **Custom Lab Packs** tab, right-click **TestLab Section** and select **Add New Lab**.
8. In the **Lab Name** field, enter **TestLab Lab**.
9. Optionally, enter a description of the lab in the **Description** field.
10. Click **Add File**, and navigate to the **TestLab** folder you created on your Desktop.
11. Select the **TestLab.top** file, and click **Open**.
12. Click **Add File**, select the **TestLab.xps** document (*the document you are currently reading*), and click **Open**.
13. Click **Add File**, and change the file type to **Multi-Device Config (*.nwc)**.
14. Select the **Loading.nwc** file, and click **Open**.
15. On the Lab Compiler, change the **File Type** to **Loading NWC**.



16. Click **Add File**, and change the file type to **Multi-Device Config (*.nwc)**, if necessary.
17. Select the **Grading.nwc** file, and click **Open**.
18. On the Lab Compiler, change the **File Type** to **Grading NWC**.
19. Click **Save** to create the lab.

Now that we have created a custom lab pack, lab section, and lab, we need to export it so that it can be used by the students.

1. Right-click **TestLab Lab Pack**, and select **Export Lab Pack**.
2. You can use a custom name for your lab pack when the **Export to Lab Pack Archive** dialog box opens or use the default **TestLab Lab Pack.lpx** name.
3. Click **Save**.

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Although this document is rather lengthy, the process of creating a custom lab is fairly quick with a bit of practice. Now that you have a lab pack file saved, you can distribute it to your students and have them import it into their copy of NetSim by selecting the Custom Lab Packs tab and then clicking **Lab > Import Lab Pack** from the Menu Bar.