Lab 9: OpenNMS

NET311 - Computer Networks Management

Instructor: Dr. Mostafa Dahshan

Objectives

1. Deploy Network Management System Software.
2. Install and configure OpenNMS.
3. Get hands-on experience with management tasks.

References

1. OpenNMS Installation Guide.
2. QuickStart.
3. Tutorial Discovery.
4. Dynamically Configuring DHCP Server Options.
5. CNT125 Network Manage Lab 1 of 4 Cisco SNMP.
6. CNT125 Network Manage Lab 3 of 4 OpenNMS.

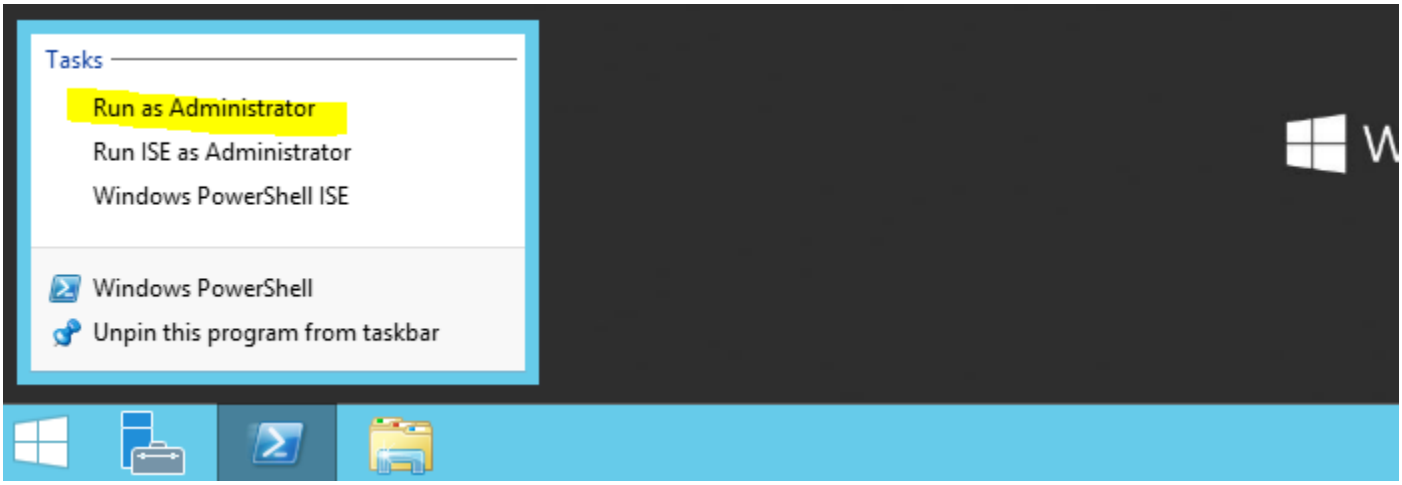
Instructions

1. Read the lab instructions.
2. Provide question answers and screenshots in the supplied answer sheet.
3. After finishing the lab, upload your saved answer sheet to LMS.

Part 1: Lab Setup

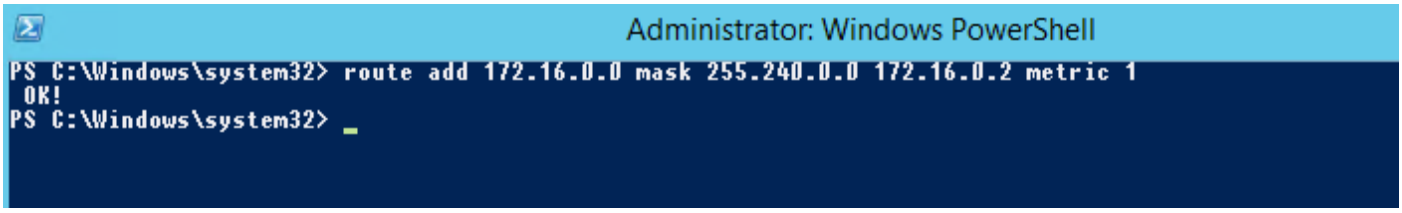
The lab setup required is the same as the lab setup for Lab 05. If you have not performed Lab 05, you must perform Part 1 in Lab 05 before completing this lab.

1. Run **PowerShell** as **Administrator**.



2. Type the following command to configure the route to the lab network:

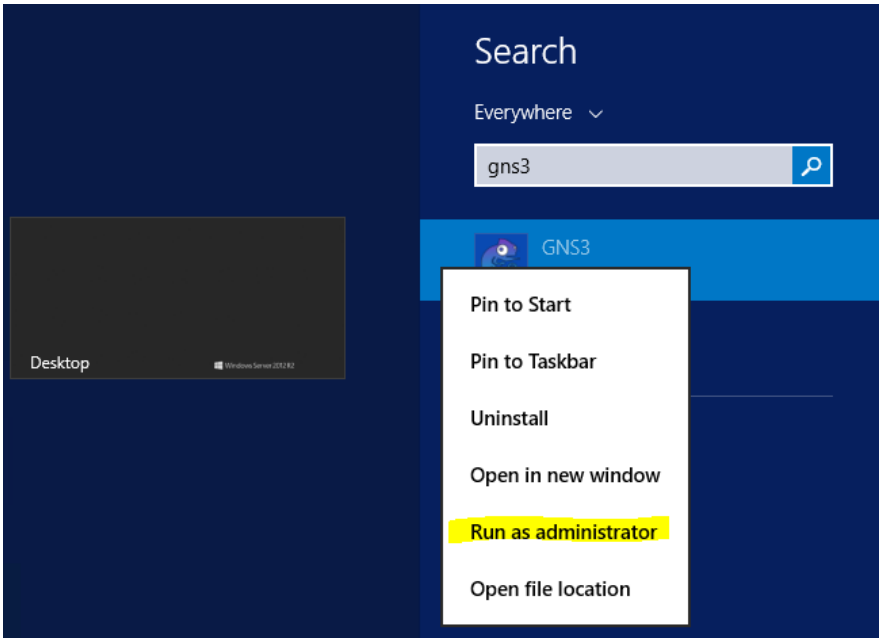
```
Route add 172.16.0.0 mask 255.240.0.0 172.16.0.2 metric 1
```



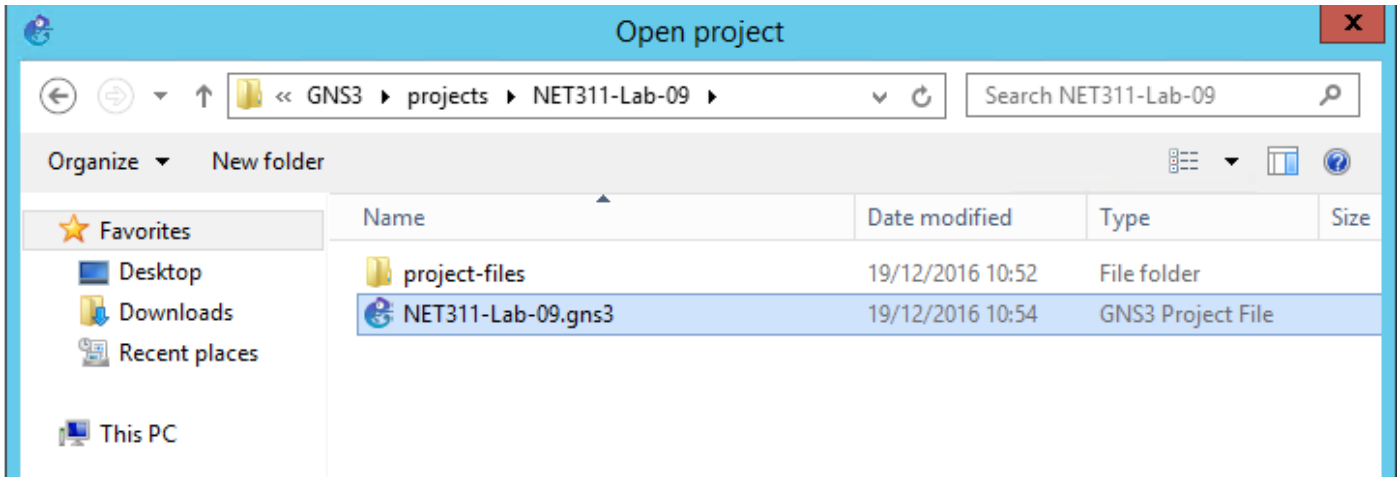
Lab sheet 1.1: provide a screenshot of the PowerShell screen.

Part 2: Starting the Network

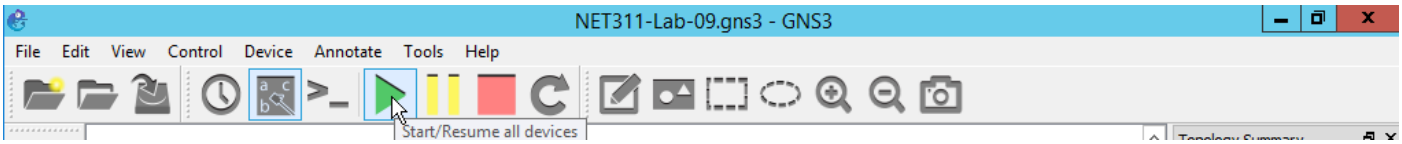
1. Run **GNS3** as an **administrator**.

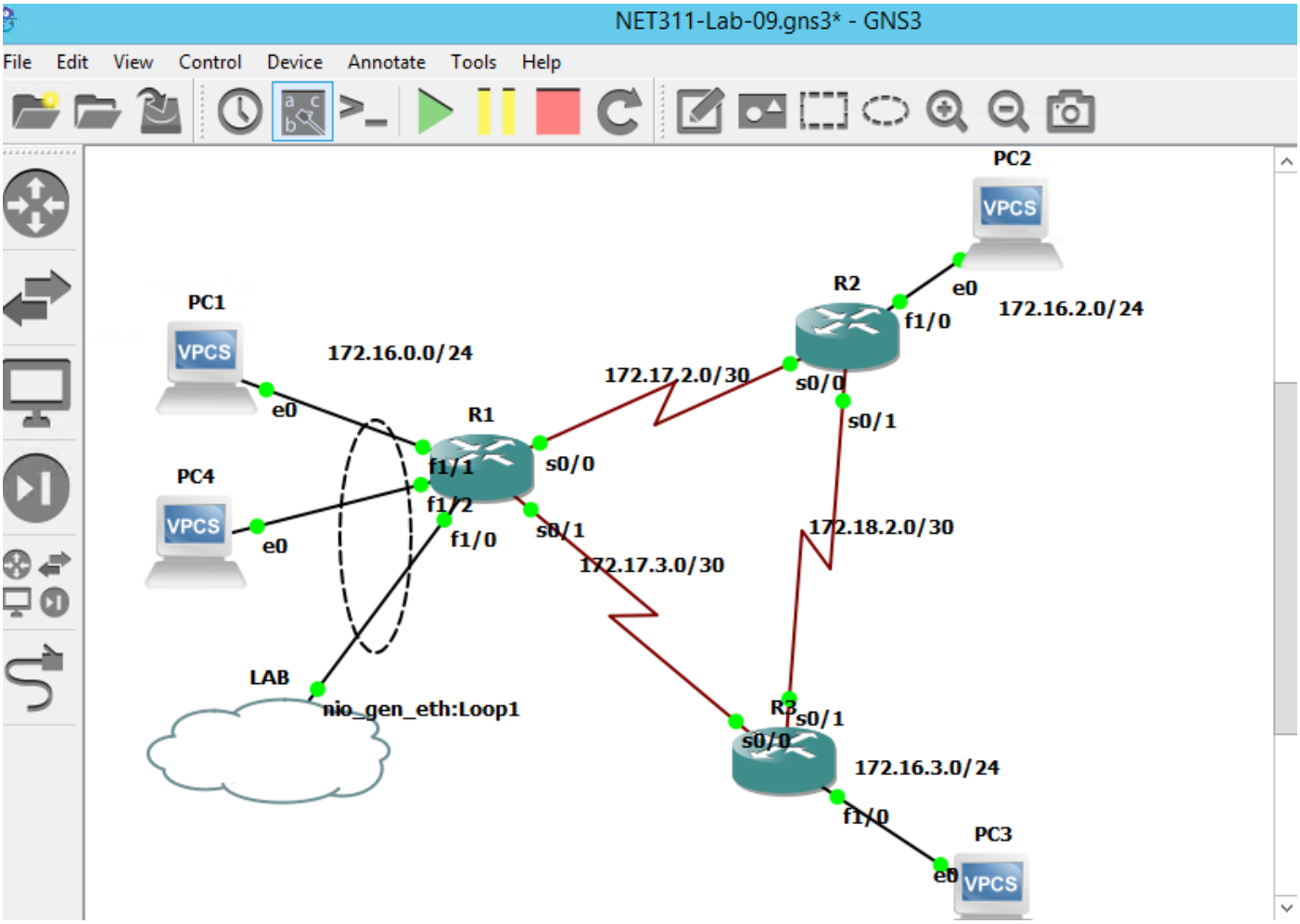


2. Open the GNS3 project **NET311-Lab-09.gns3**.



1. Start all devices

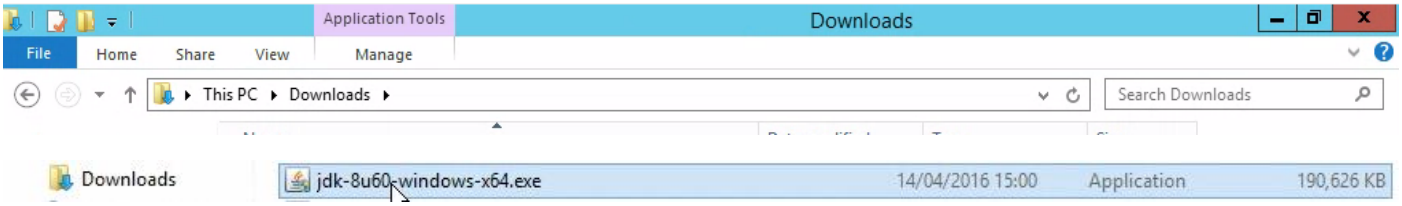




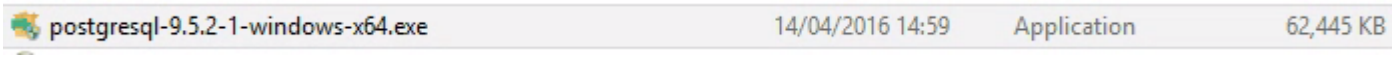
Lab sheet 2.1: provide a screenshot of the running network.

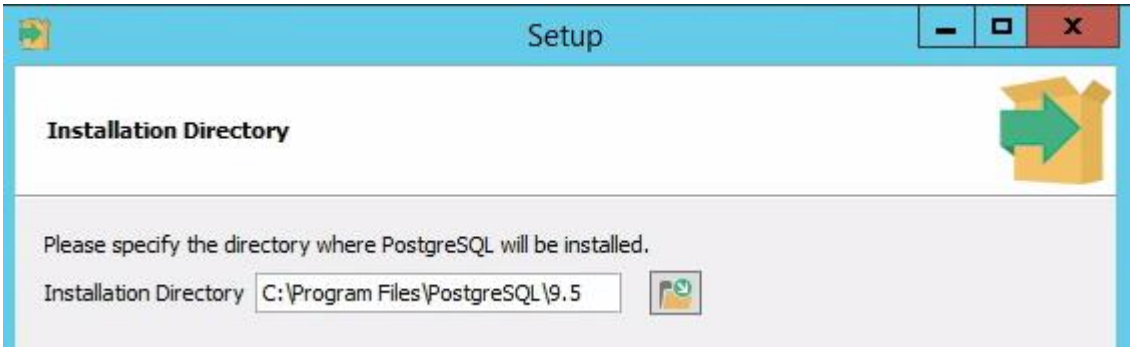
Part 3: Install OpenNMS

1. Verify that Java Development Kit is installed. If not, install it using the default options. All installation files are available under the **Downloads** folder.

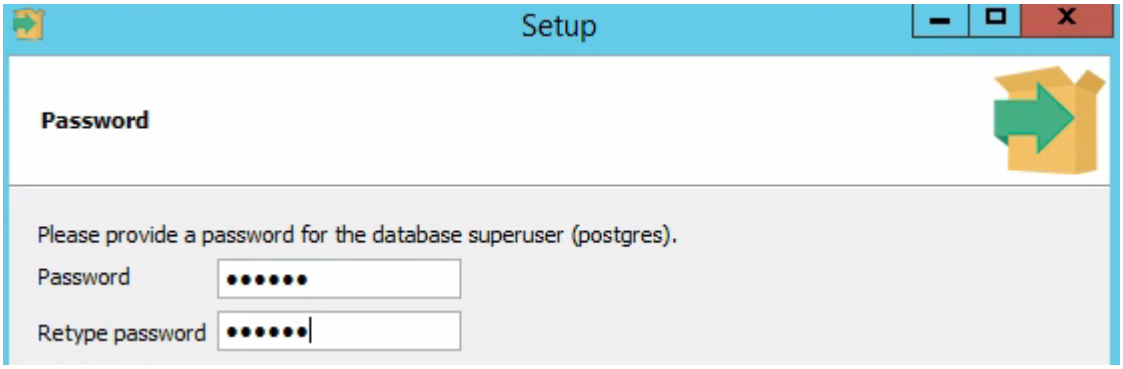


2. Run the PostgreSQL installer.

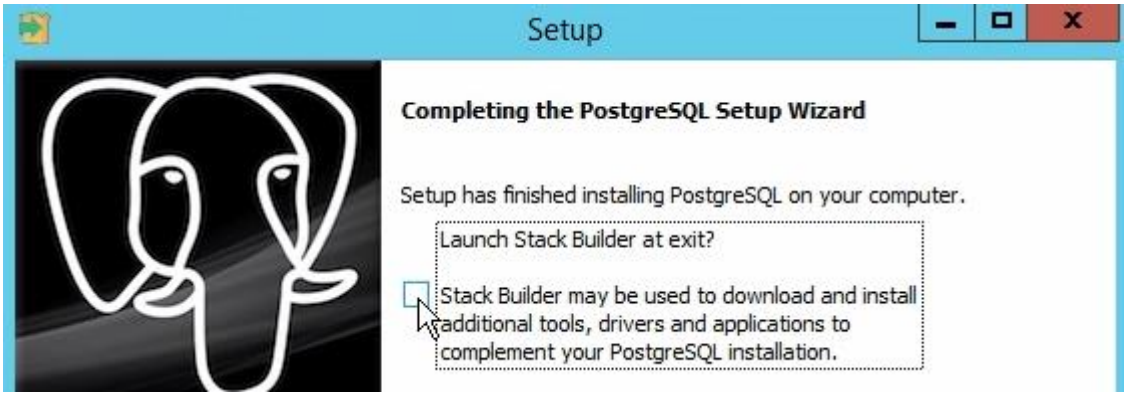




3. When prompted for password for the database superuser (postgres), enter: **net311**.

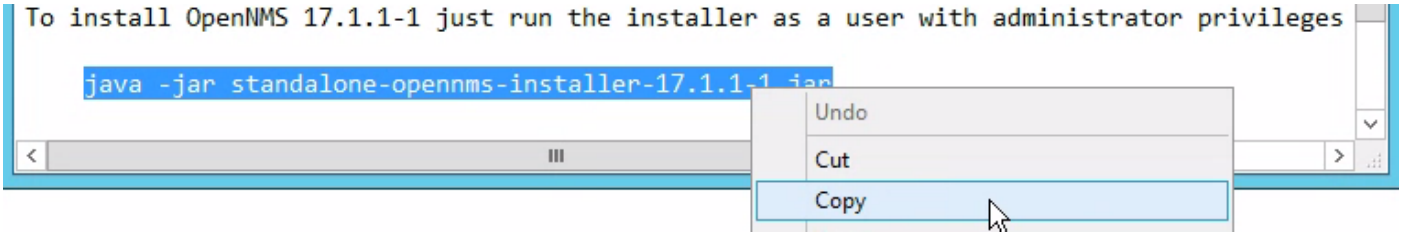


4.Make sure the "Stack Builder" option is unchecked, then click Finish.

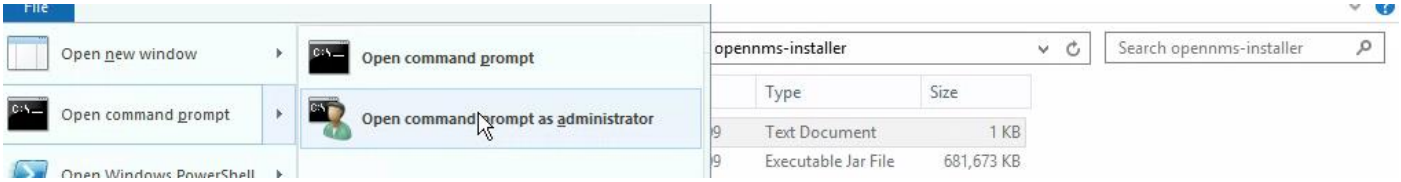


5. Extract the OpenNMS installer file.

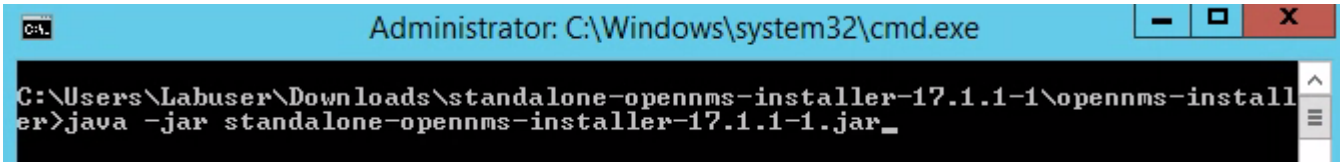
6. Open the INSTALL.txt file in the extracted folder and copy the installation command from there.



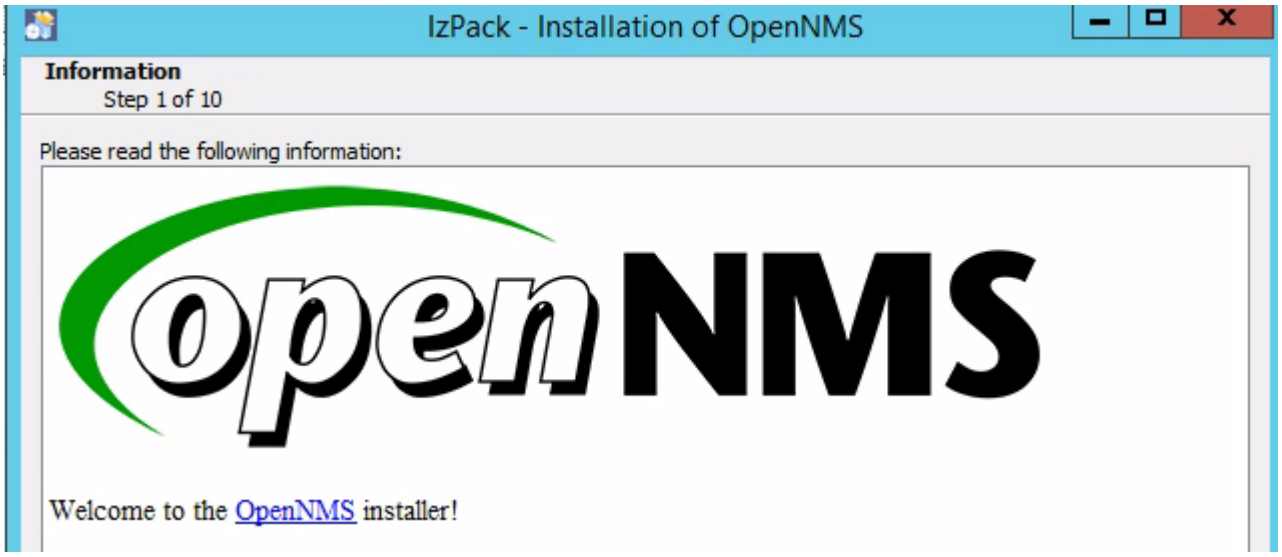
7. Open an Administrator command prompt in the extracted folder



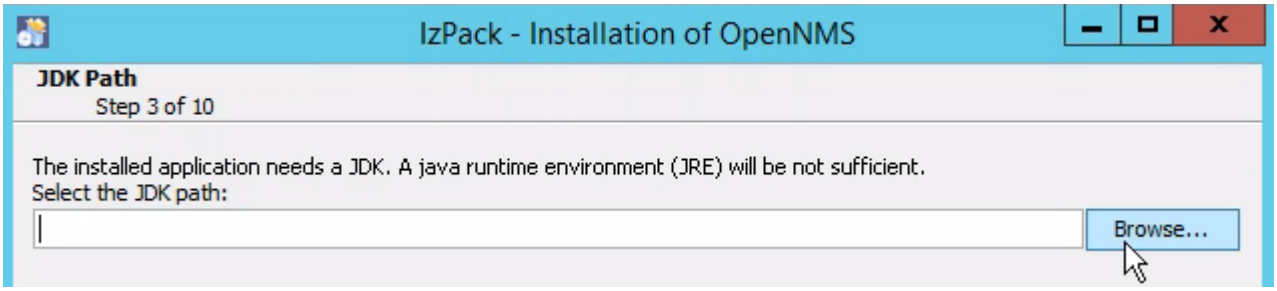
8. Paste the installation command



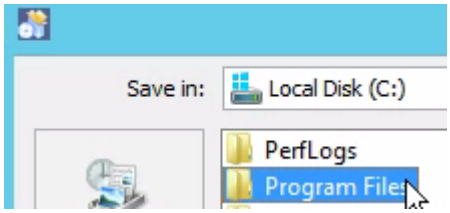
The OpenNMS installer starts.

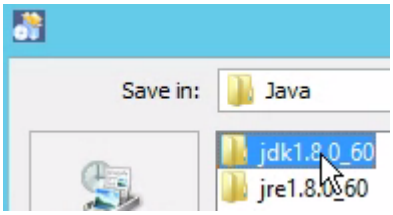


9. When prompted for the JDK path, click **Browse**.

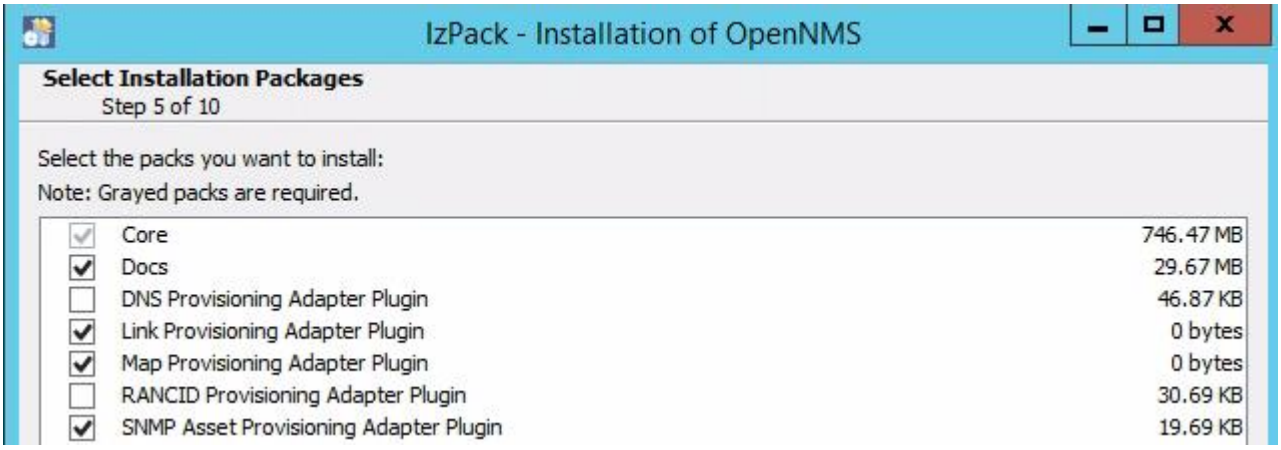


10. Select the JDK installation folder.

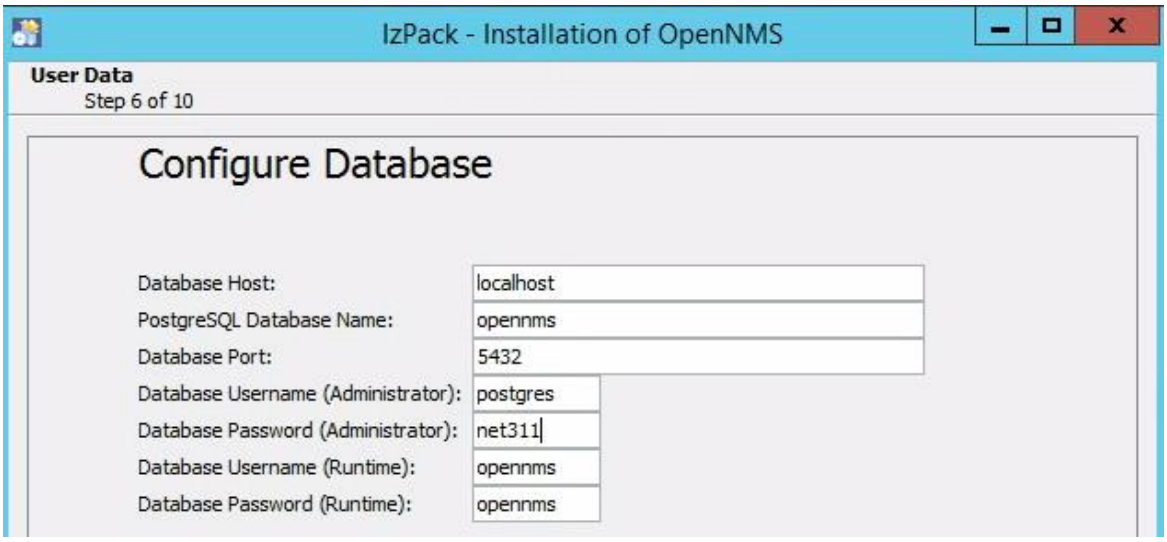




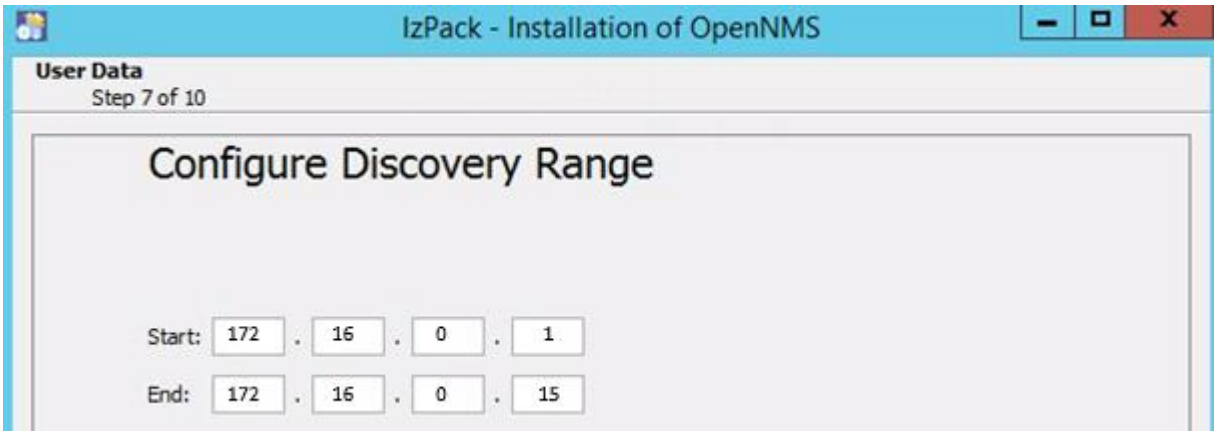
11. Select the Installation Packages.



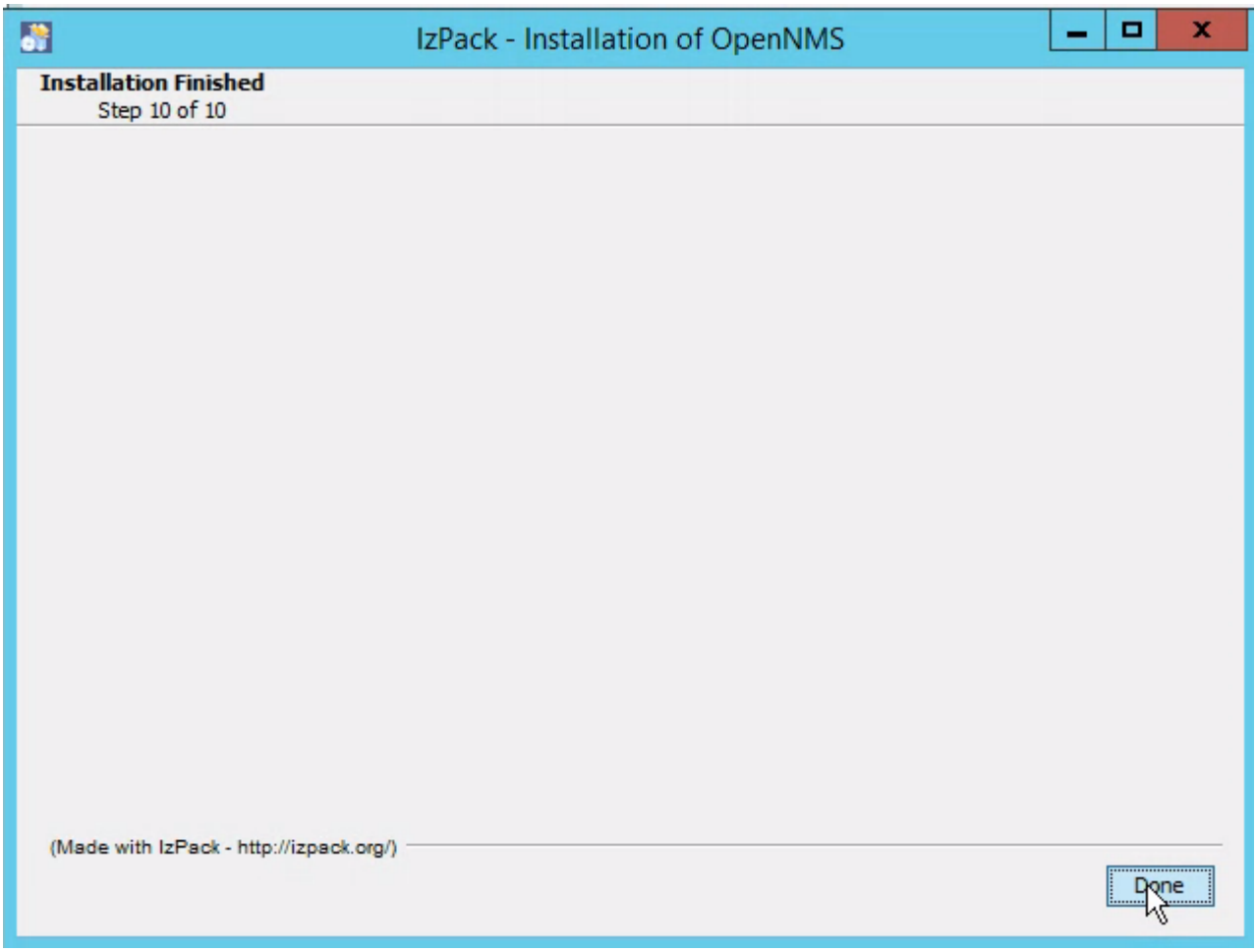
12. In the Database Password (Administrator), type: **net311**.



13. In the Discovery range screen, add the range **172.16.0.1** to **172.16.0.15**. We can add more ranges later.



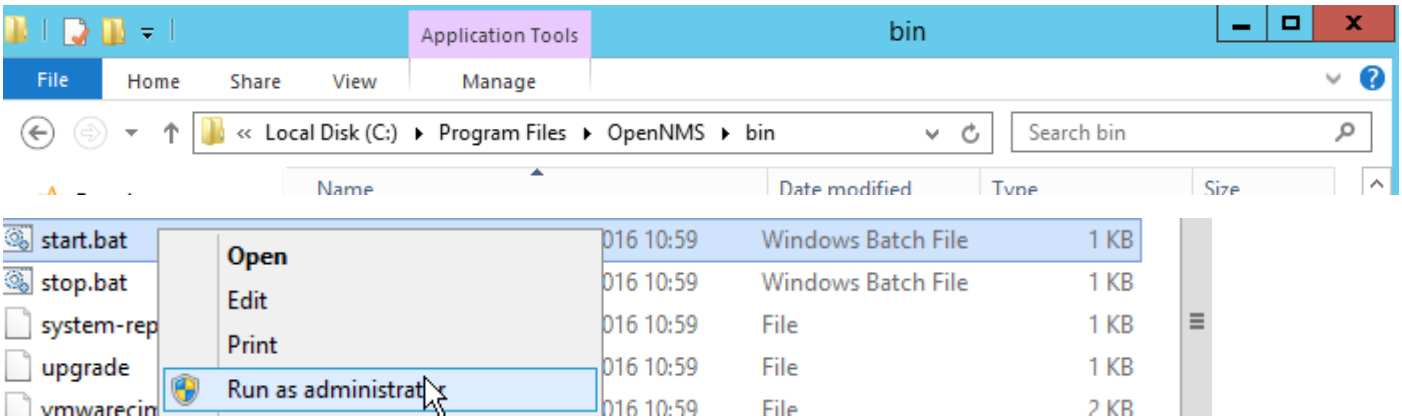
The installation is now finished.



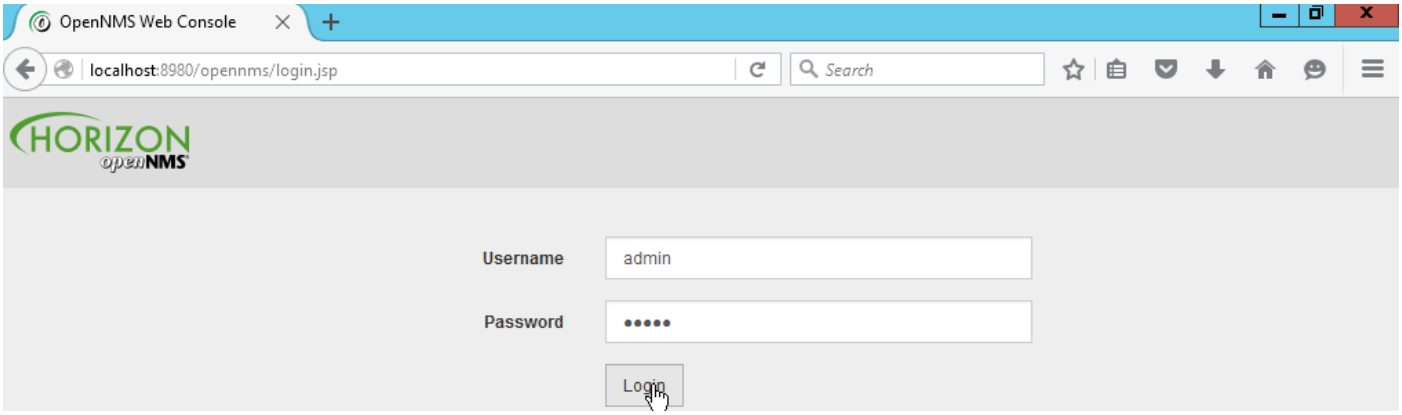
Lab sheet 3.1: provide a screenshot of the Installation Finished screen of OpenNMS.

Part 4: Running OpenNMS and Network Discovery.

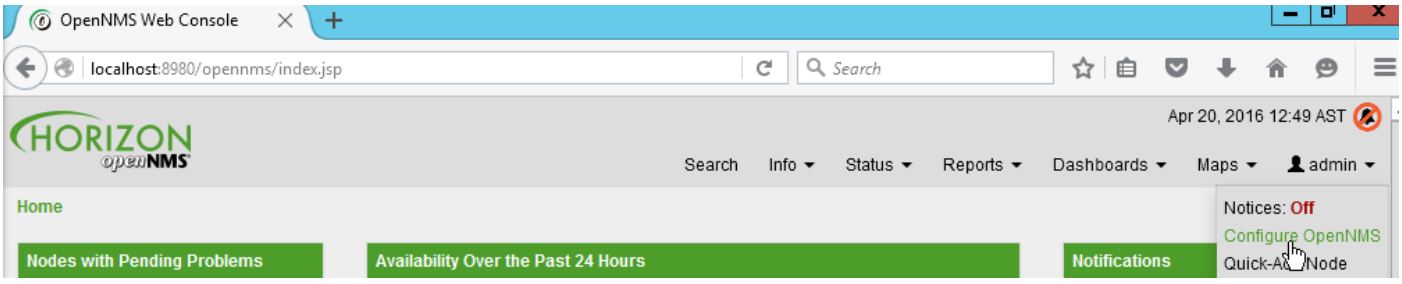
1. Browse to the OpenNMS installation folder, then run the **start.bat** file **as an Administrator**.



2. Run the Firefox web browser and open the address **http://localhost:8980**. Login with Username: **admin** and Password: **admin**.



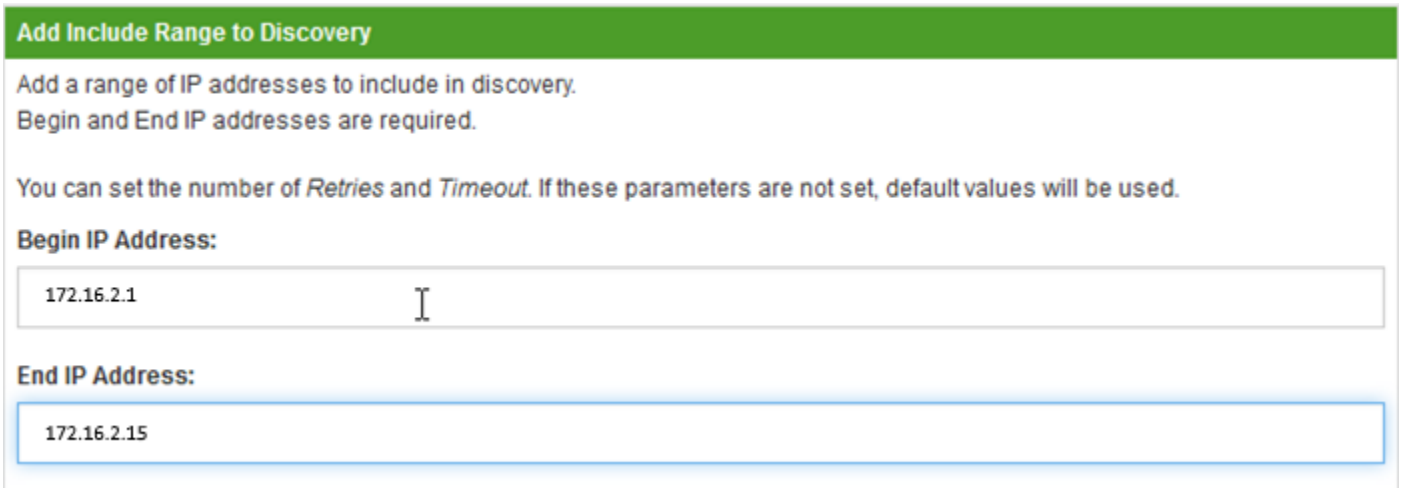
3. From the **admin** menu, click **Configure OpenNMS**.

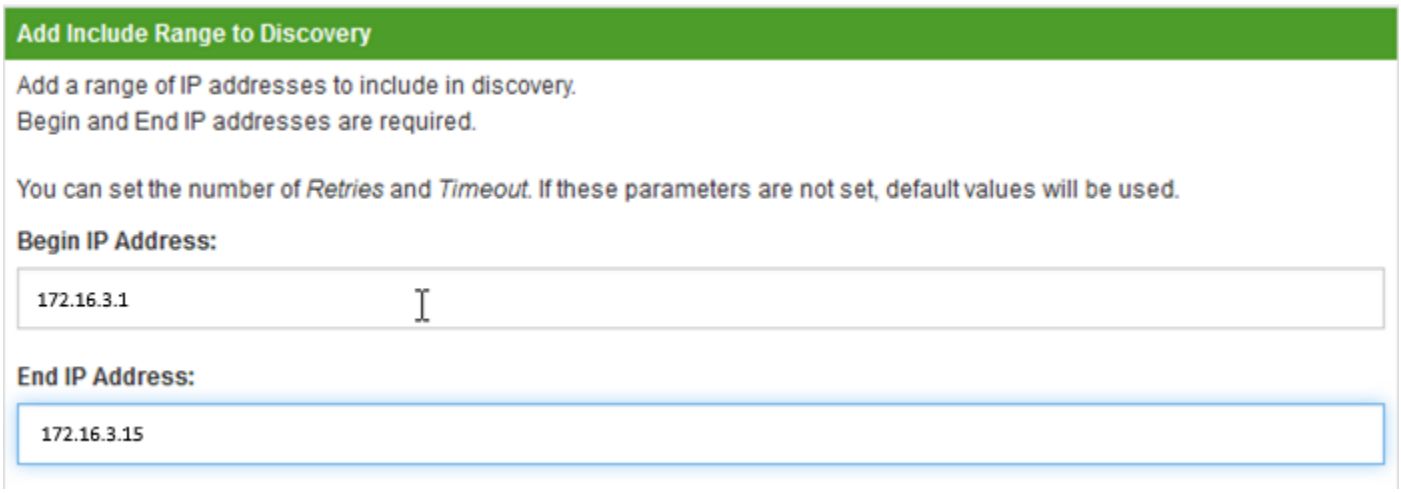


4. Click on **Configure Discovery**.

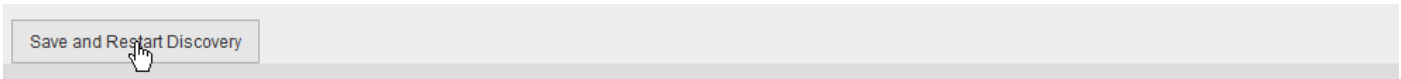
5. Under **Include Ranges**, click **Add New**.

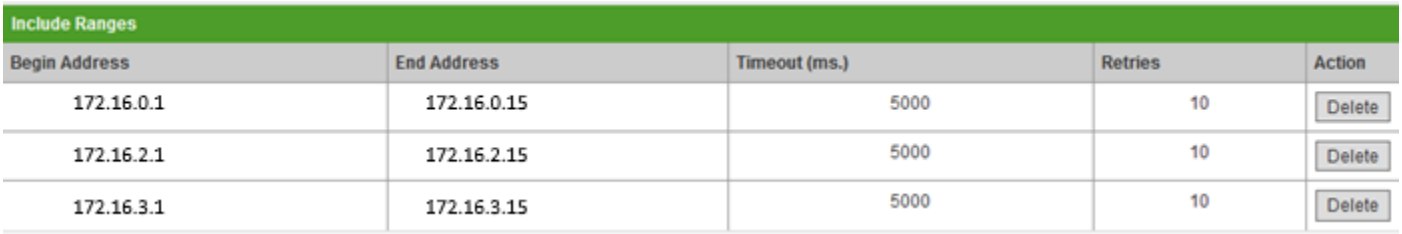
6. Add the following address ranges. Set the number of **retries** to **10** and the **timeout** to **5000**.





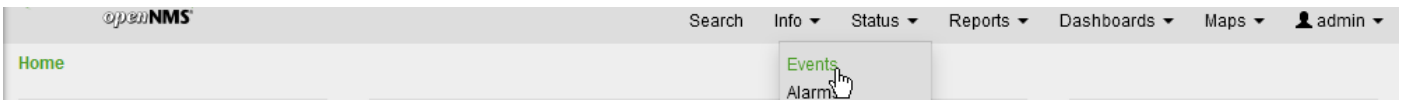
7. Click on **Save and Restart Discovery**.



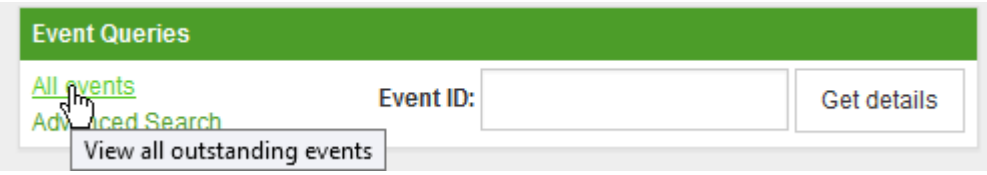


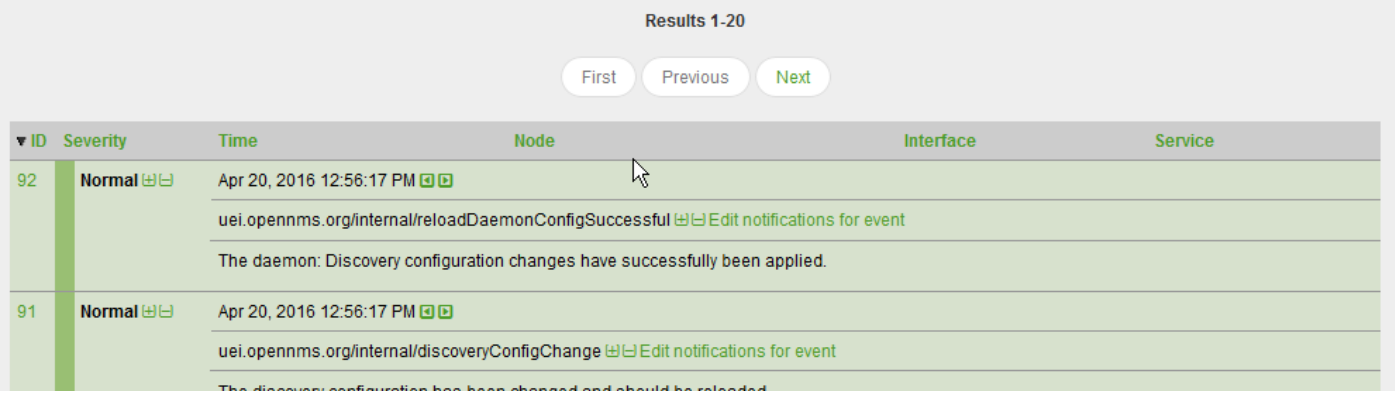
Lab sheet 4.1: provide a screenshot showing the Include Ranges after adding all ranges.

8. From the **Status** menu, click on **Events**.



9. Click on **All events**.

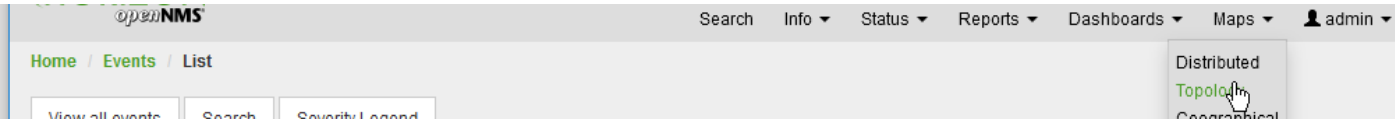




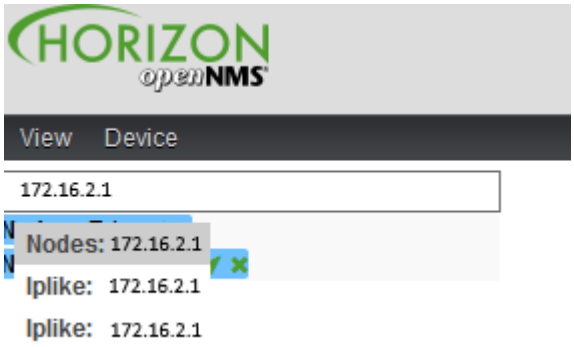
Lab sheet 4.2: provide a screenshot showing part of the events screen.

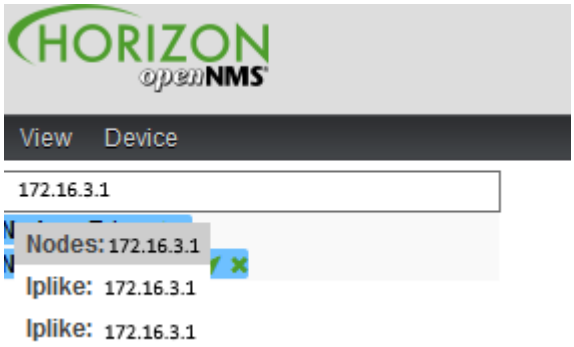
10. Wait for about 5 minutes for the discovery to update.

11. From the **Maps** menu, click on **Topology**.

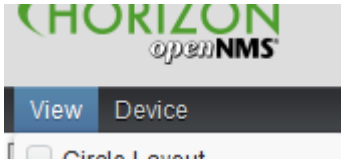


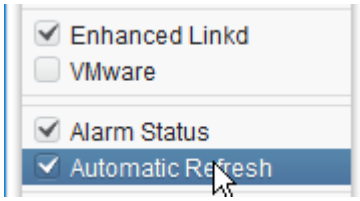
12. In the Search box, enter the IP addresses of the routers: **172.16.0.1**, **172.16.2.1**, **172.16.3.1**.

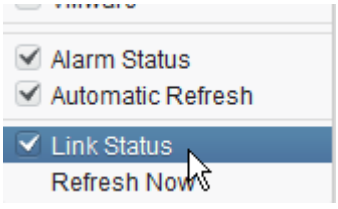




13. From the **View** menu in the Topology window, check **Automatic Refresh** and **Link Status**.







Part 5: OpenNMS Network Troubleshooting.

1. In GNS3, double click on R2 to open its terminal.

2. Take down the link between R2 and R1.

```
conf t

int s0/0

shutdown
```

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int s0/0
R2(config-if)#shutdown
*Mar  1 00:23:32.727: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down
*Mar  1 00:23:32.739: %OSPF-5-ADJCHG: Process 1, Nbr 10.1.3.1 on Serial0/0 from FULL to DOWN, Neighbor Down: I
nterface down or detached
```

3. Check the Status> Events >All events and look for the LinkDown event.

Lab sheet 5.1: provide a screenshot showing the events screen after the link is taken down.

4. Bring up the link between R2 and R1 again.

```
no shutdown
```

5. Check the Status> Events >All events and look for the LinkUp event.

Lab sheet 5.2: provide a screenshot showing the events screen after the link comes up.