Lab 5: Draw Network Diagrams

Lab Scenario

Until now, you have gathered information about the open ports, services running on the ports, OS details, security mechanisms details, etc. of the target network using various port and network scanning techniques and tools.

As a professional ethical hacker or a pen tester, the last step in the penetration process is to draw a network diagram that assists in identifying the topology or architecture of a target network. The network diagram also helps to trace the path to the target host in the network and enables you to understand the position of firewalls, IDSs, routers, and other access control devices.

As a professional ethical hacker or pen tester, you should be able to create a pictorial representation of network topology used in the target network. The network diagrams can be used to launch further attacks on the target network.

Lab Objectives

- Draw network diagrams using Network Topology Mapper

Overview of Network Diagrams

Drawing a network diagram assists in the identification of the topology or architecture of a target network, and further assists you in finding the vulnerabilities or weak points of security mechanisms. These vulnerabilities can then be exploited to bypass the target's network. The network diagram also helps the network administrators to manage their networks.

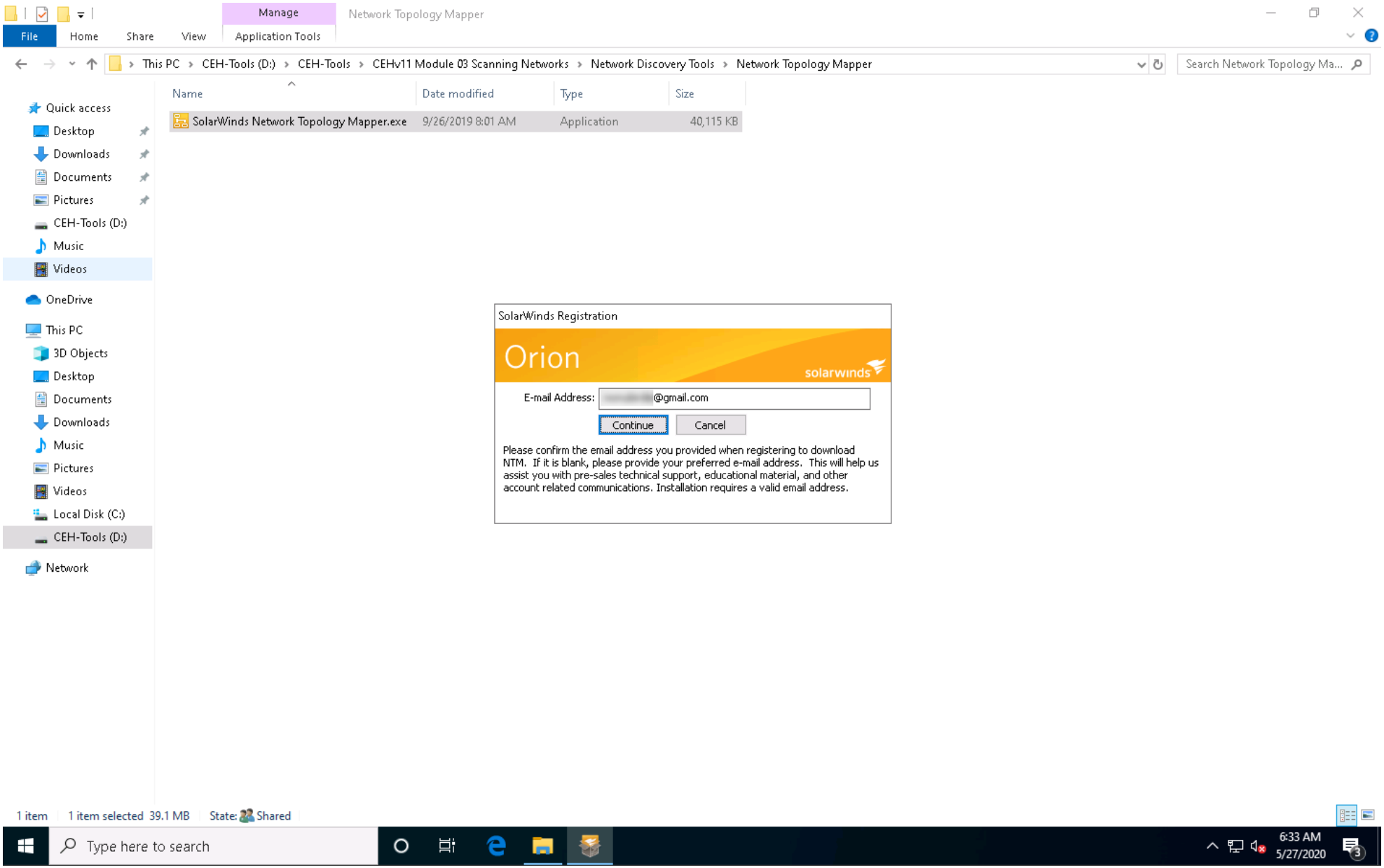
Task 1: Draw Network Diagrams using Network Topology Mapper

Network Topology Mapper discovers a network and produces a comprehensive network diagram that integrates OSI Layer 2 and Layer 3 topology data. It automatically detects new devices and changes to network topology, simplifies inventory management for hardware and software assets, and addresses reporting needs for PCI compliance and other regulatory requirements

Here, we will use Network Topology Mapper to draw network diagrams of the target network.

1. In the **Windows 10** machine, navigate to **D:\CEH-Tools\CEHv11 Module 03 Scanning Networks\Network Discovery Tools\Network Topology Mapper**, and then double-click **SolarWinds Network Topology Mapper.exe**.

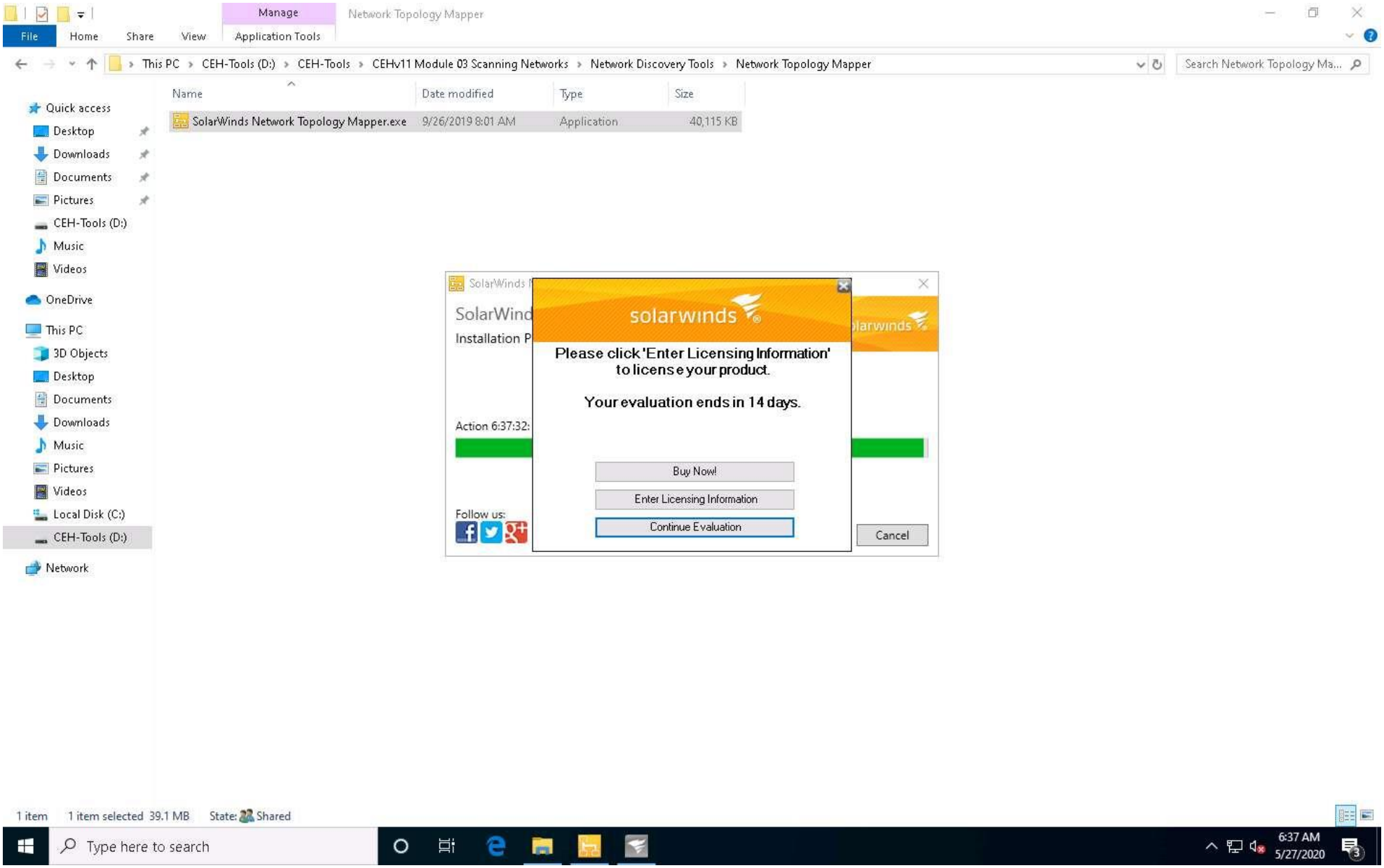
2. The **SolarWinds Registration** dialog-box opens. Enter a working email address, and then click **Continue**.



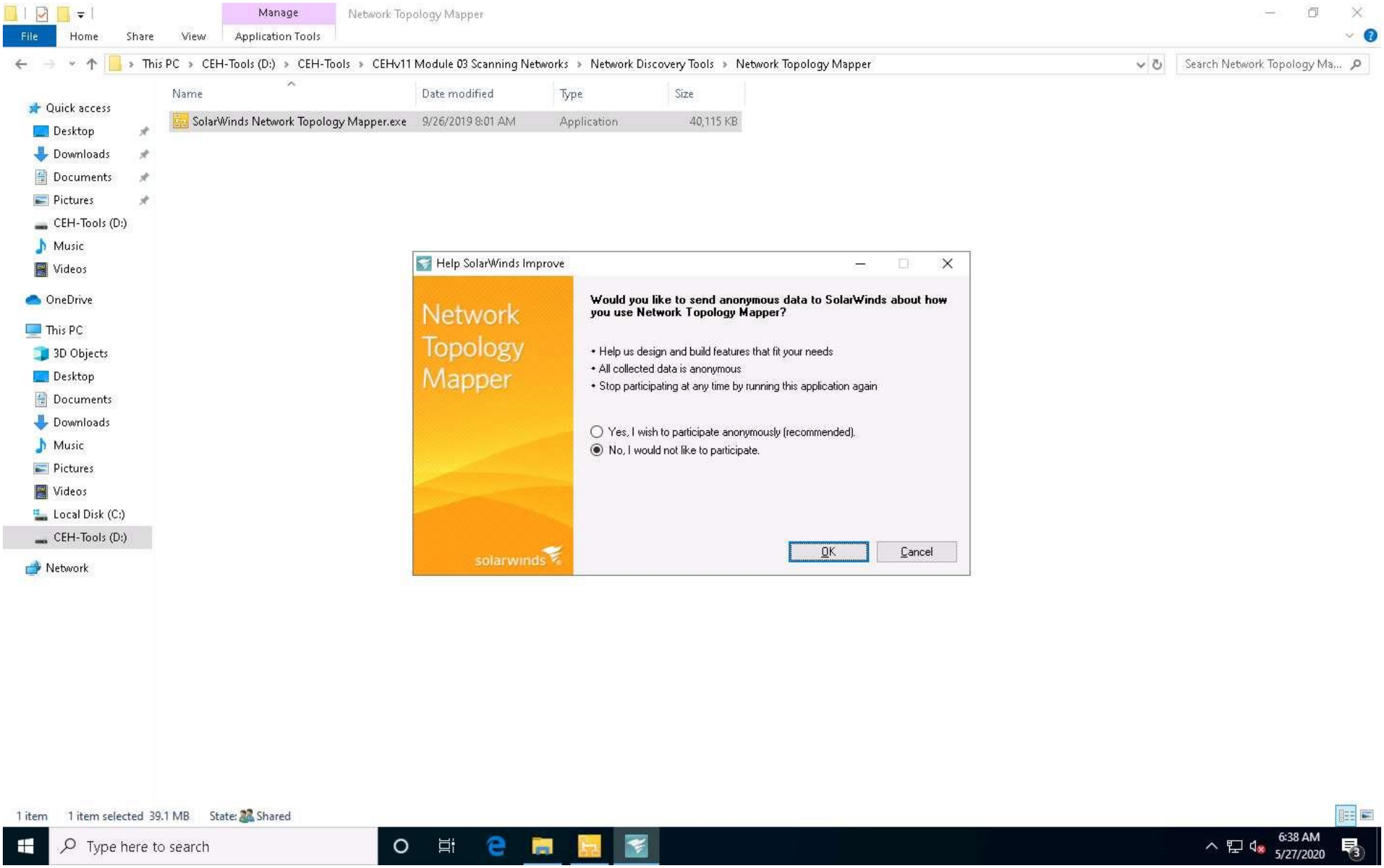
3. In the next window, accept the license agreement and click **Install**.

If a **User Account Control** window appears, click **Yes**.

4. The SolarWinds license pop-up appears; click **Continue Evaluation**.

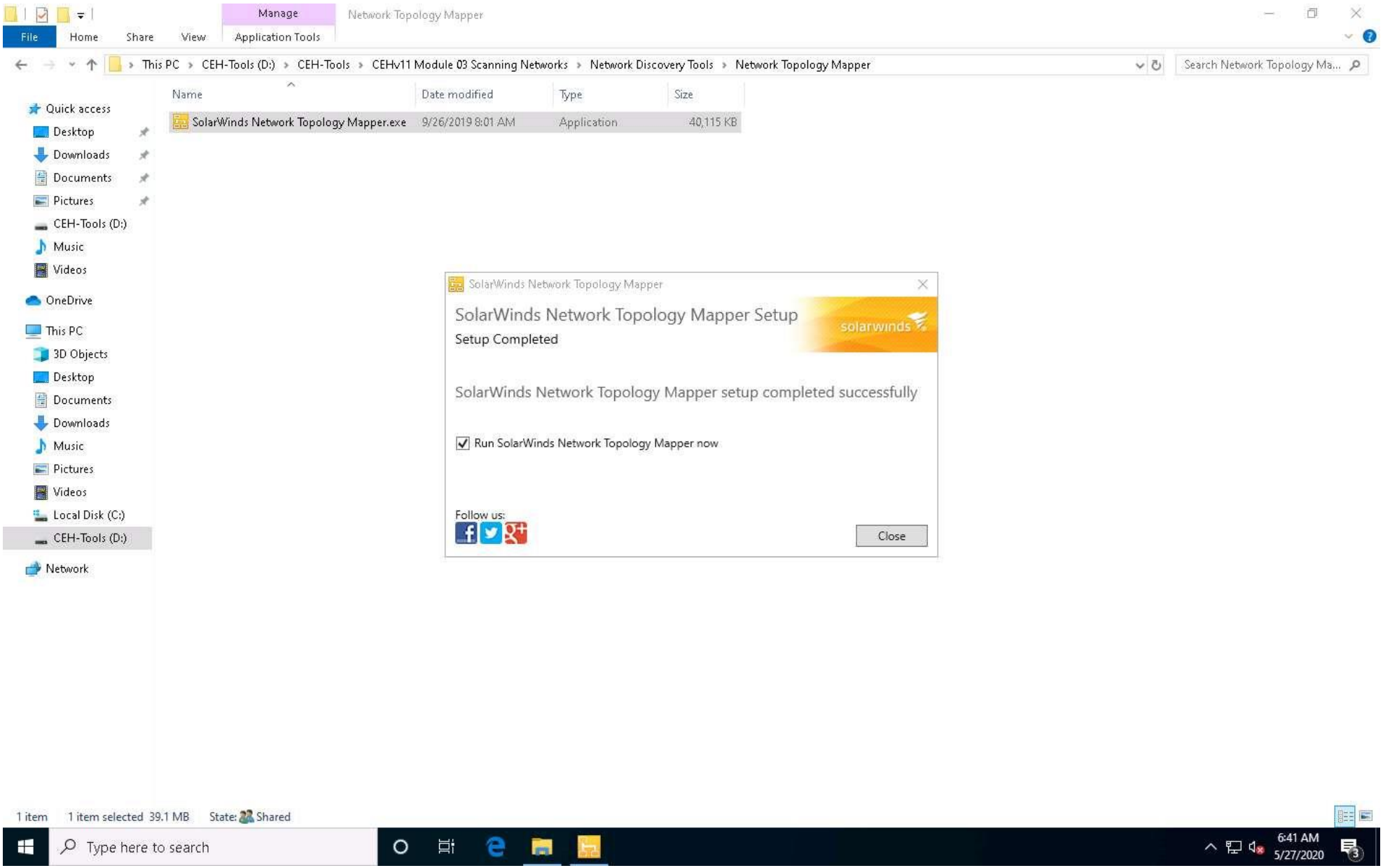


5. ☐ The **Help SolarWinds Improve** window appears. Click the **No, I would not like to participate** radio button, and then click **OK**.

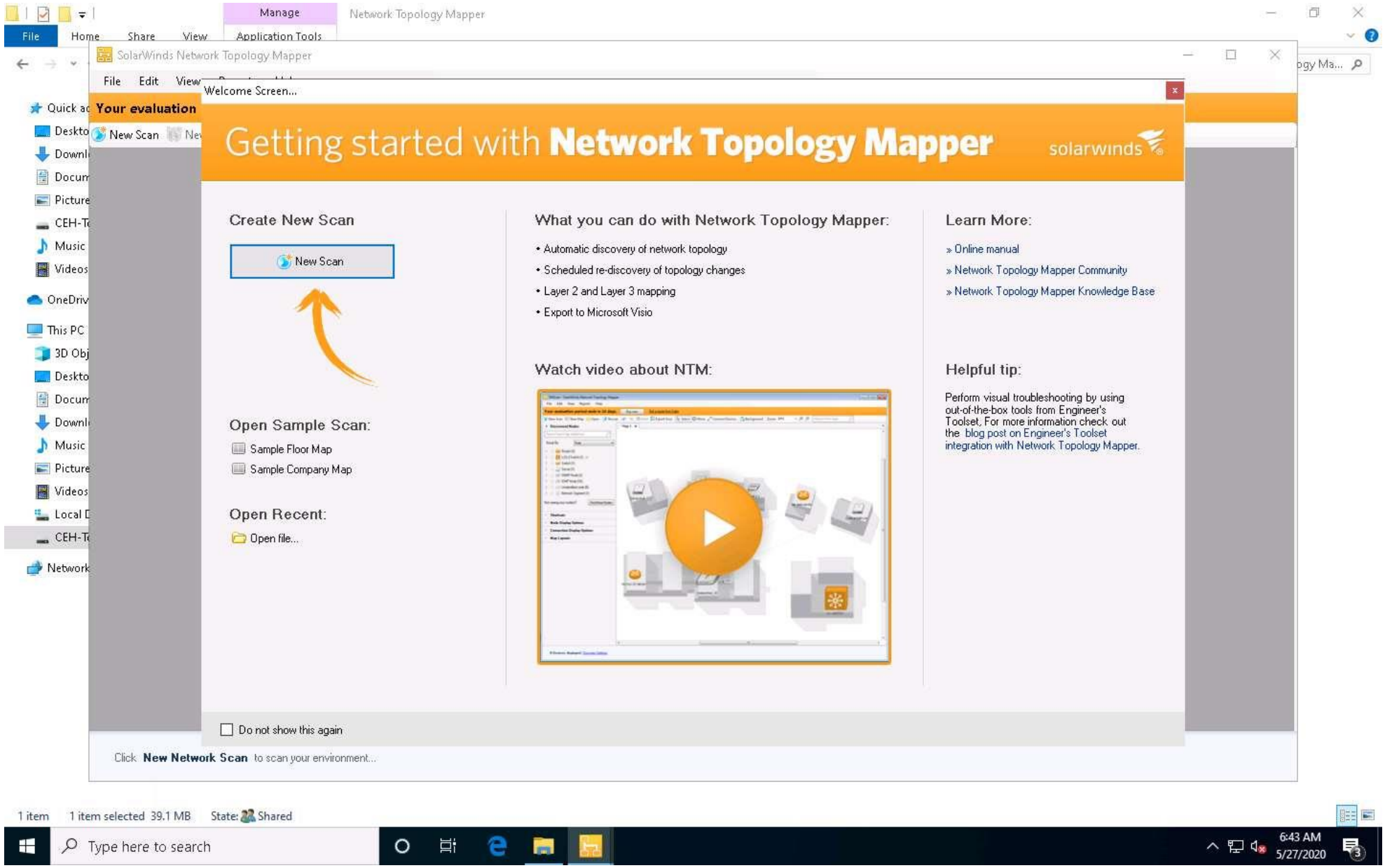


6. ☐ Once the installation is complete, and the **SolarWinds Network Topology Mapper** window opens, click **Close**.

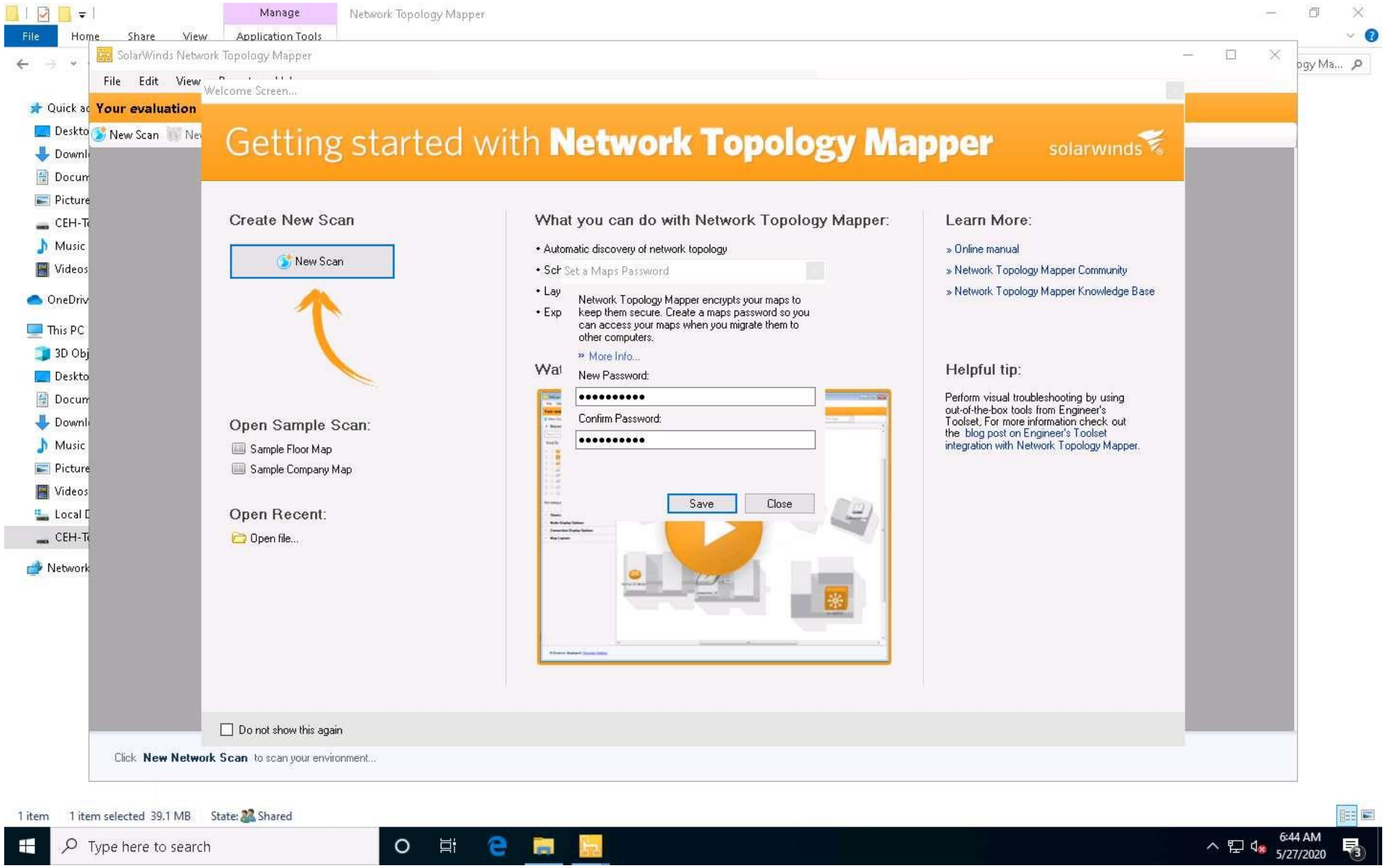
Ensure that the **Run SolarWinds Network Topology Mapper now** option is selected.



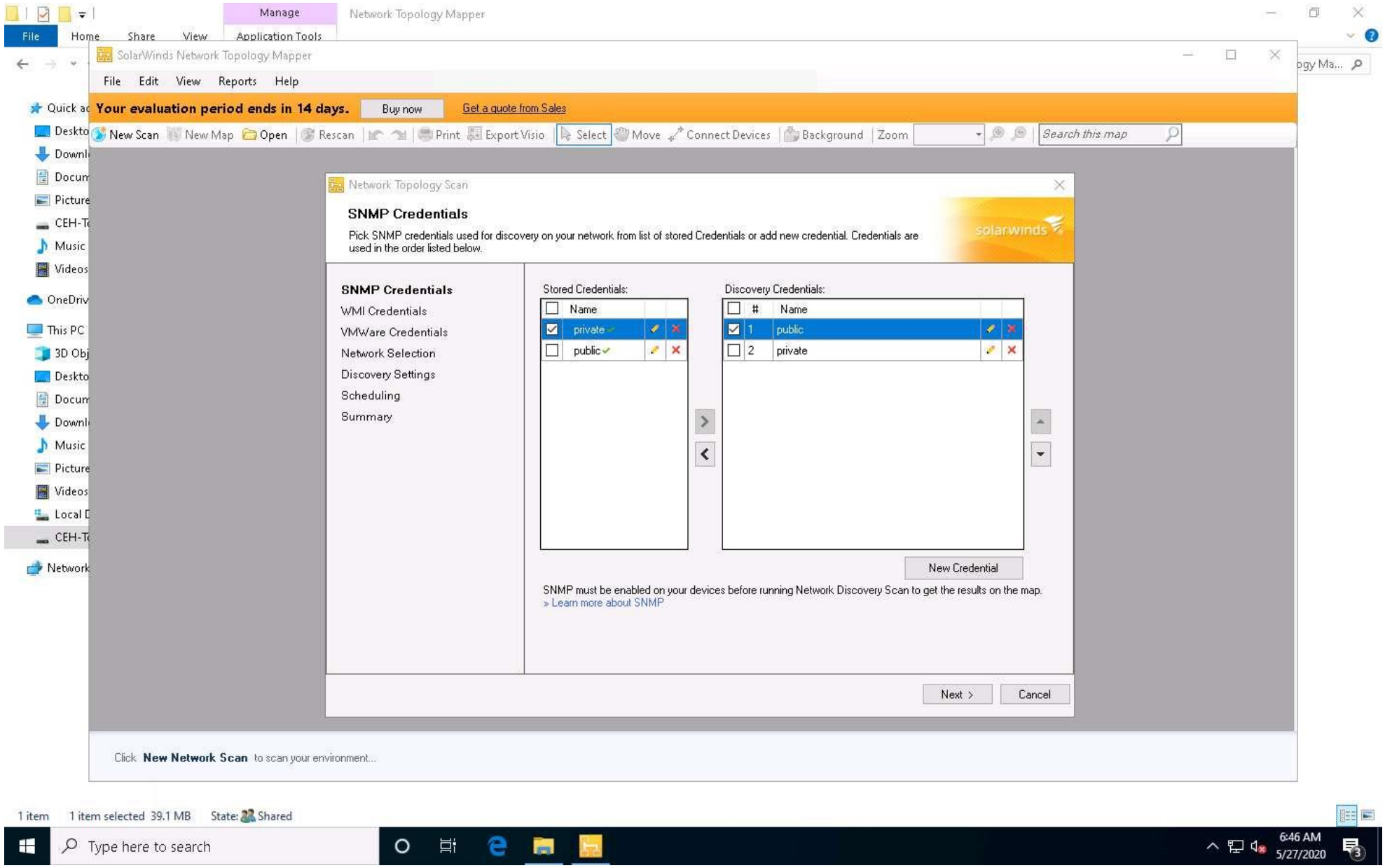
7. ☐ The **Solarwinds** pop-up opens; click **Continue Evaluation**.
8. ☐ The **SolarWinds Network Topology Mapper** main window appears, along with the **Welcome Screen…**. Click **New Scan** in the left pane of the **Welcome Screen**.



9. ☐ The **Set a Maps Password** pop-up appears. Enter a password (here, **qwerty@123**) of your choice in the **New Password** field, re-enter the same password in the **Confirm Password** field, and click **Save**.

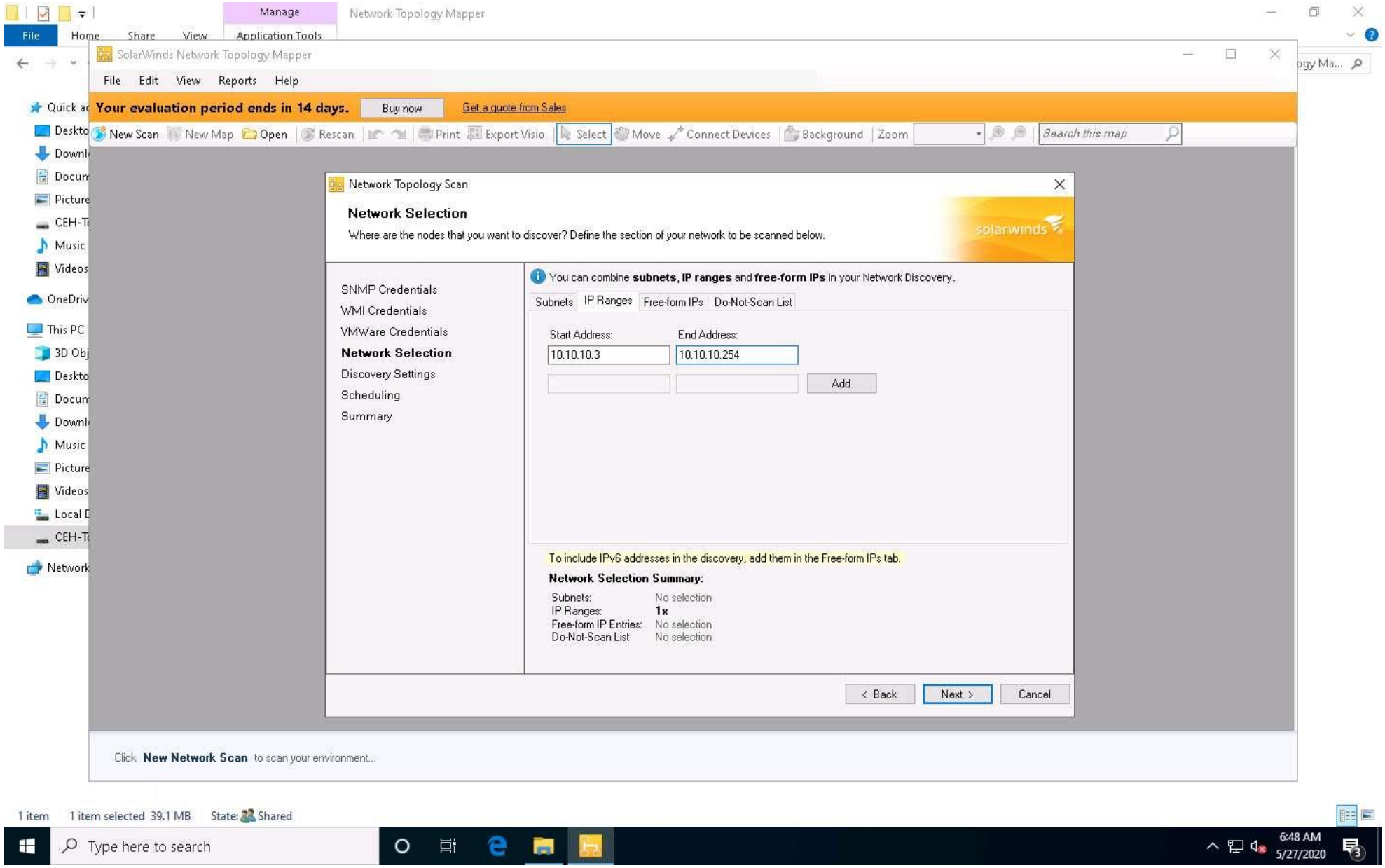


10. ☐ The **Network Topology Scan** window appears. In the **SNMP Credentials** section, select the **private** credential under the **Stored Credentials** section and **public** credential under the **Discovery Credentials** section, and then click **Next**.

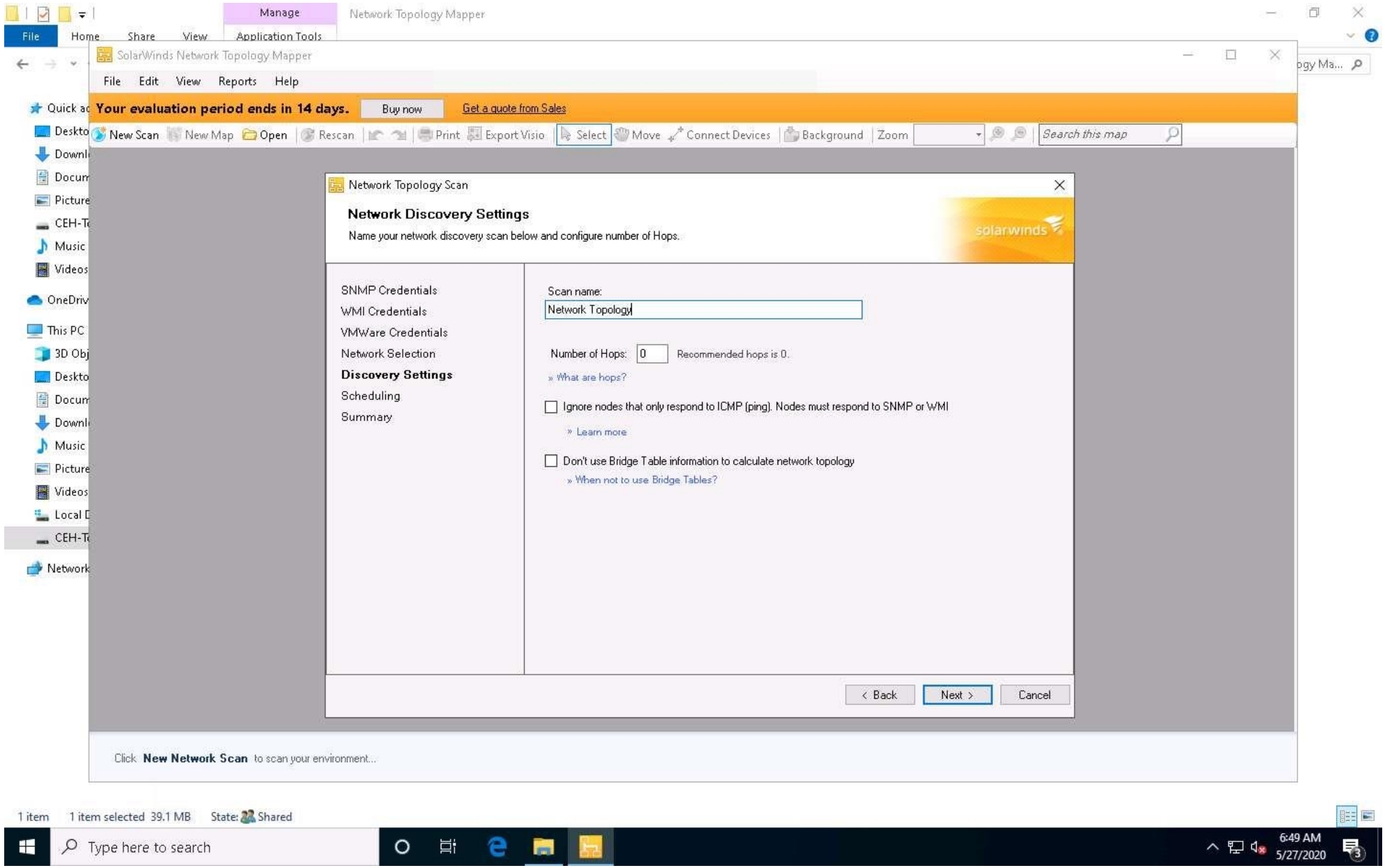


11. ☐ Leave the **WMI Credentials** and **VMWare Credentials** section to default and click **Next**.

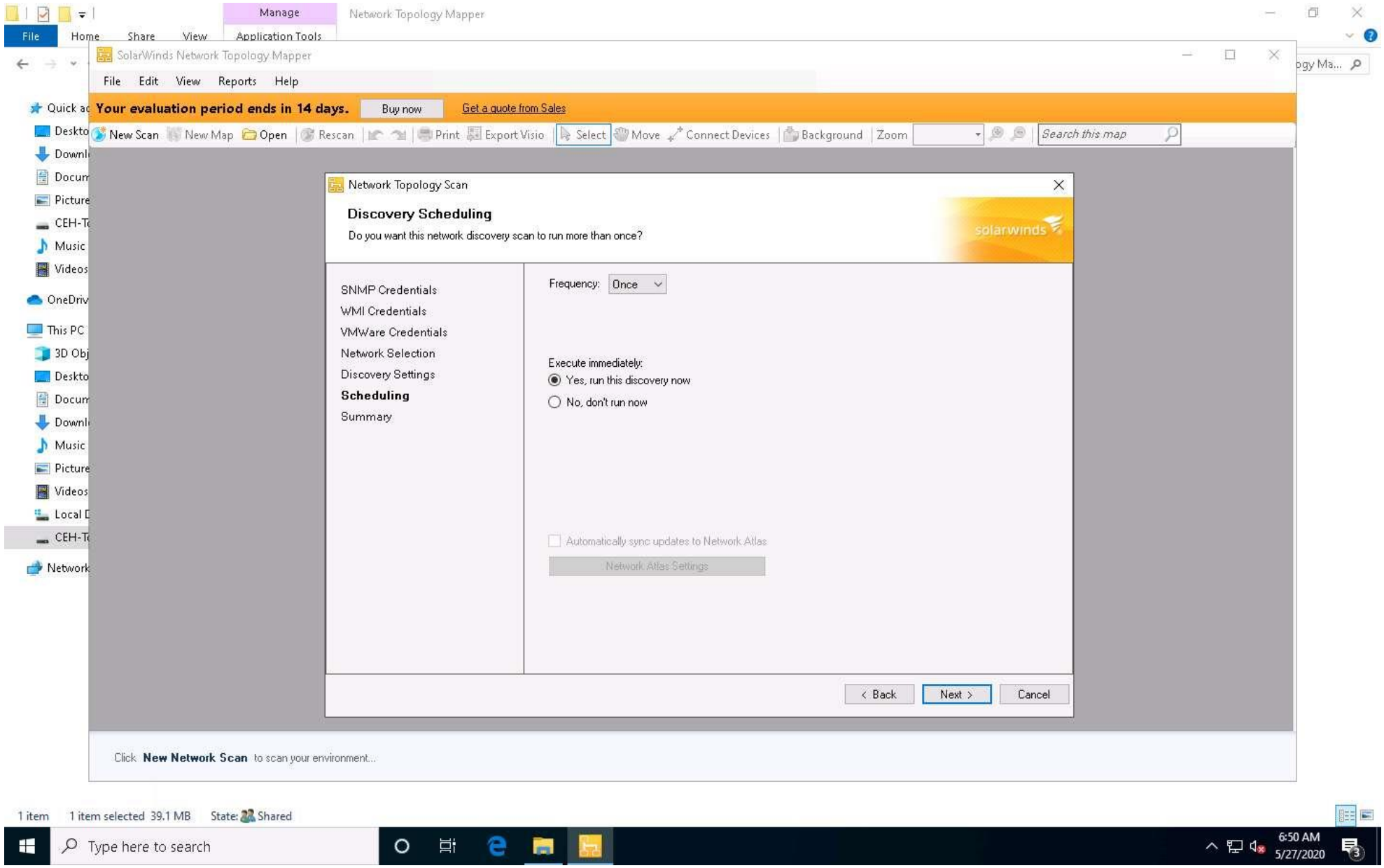
12. The **Network Selection** section appears. Click the **IP Ranges** tab in the right-pane, enter the IP address range (**10.10.10.3 - 10.10.10.254**) in the **Start Address** and **End Address** fields, and click **Next**.



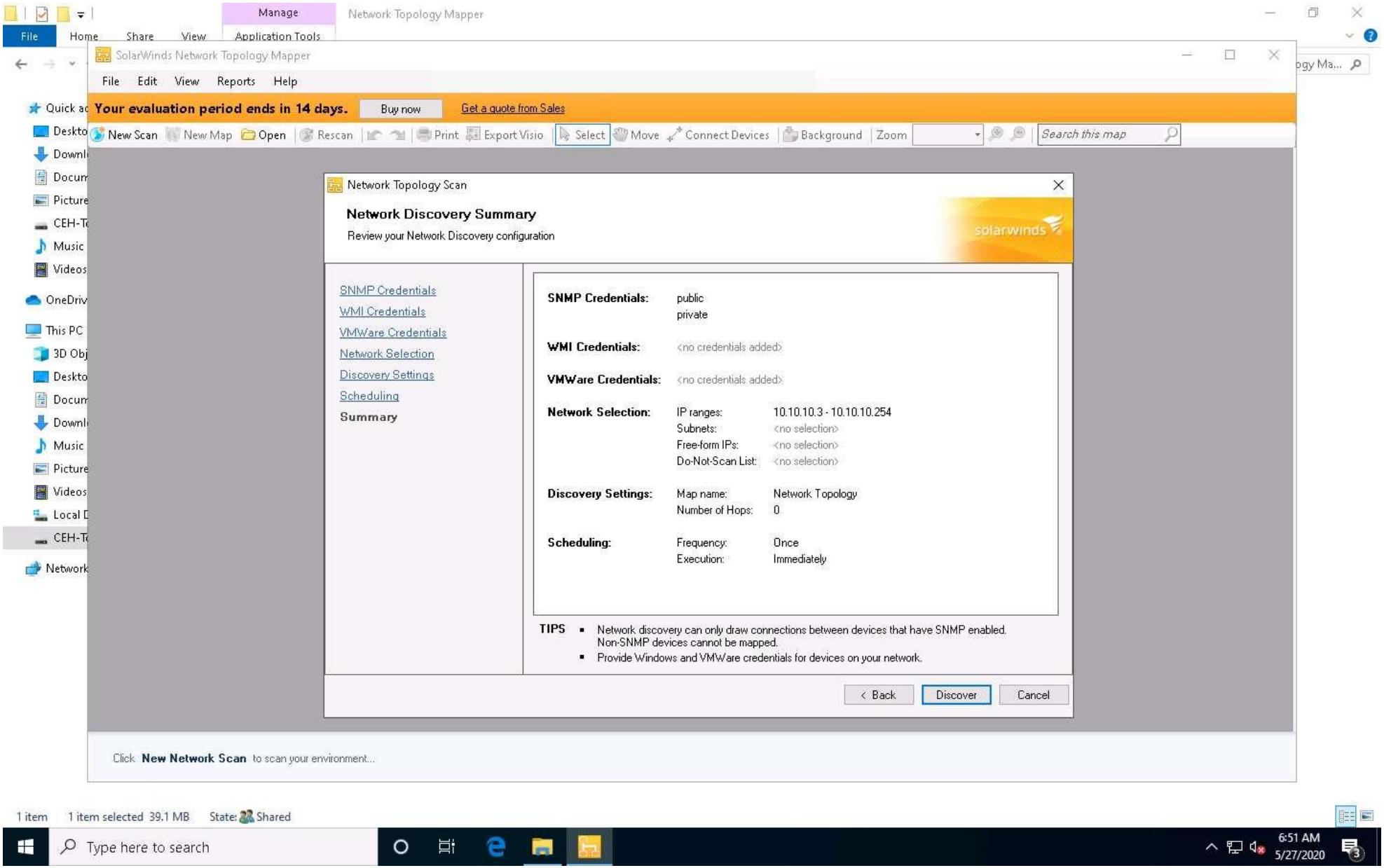
13. ☐ The **Discovery Settings** section appears. Enter a name under the **Scan name** field (here, "**Network Topology**") and click **Next**.



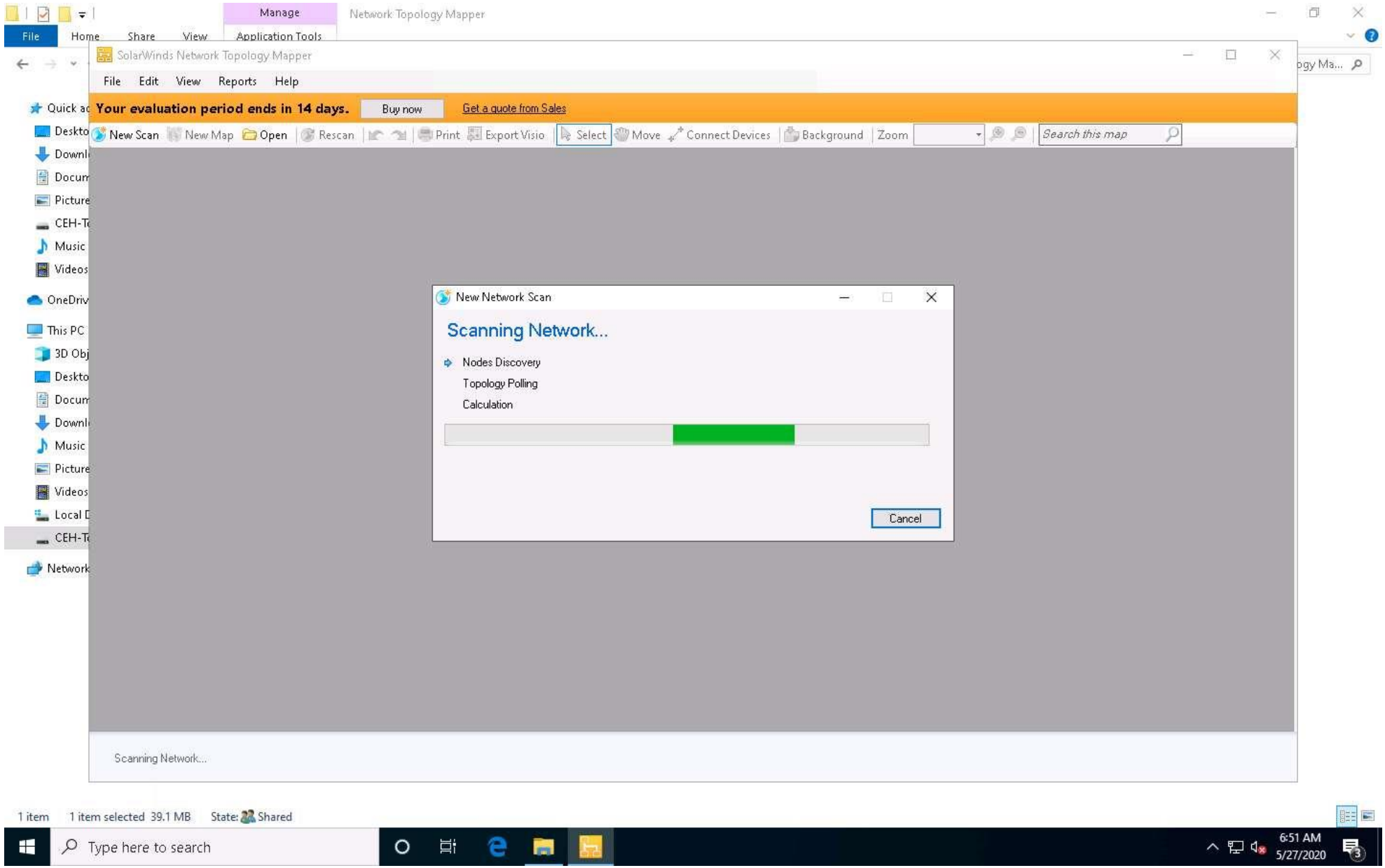
14. ☐ The **Scheduling** section appears. Ensure that **Once** is selected in the **Frequency** drop-down menu; under the **Execute immediately** radio button **Yes, run this discovery now** is selected; then, click **Next**.



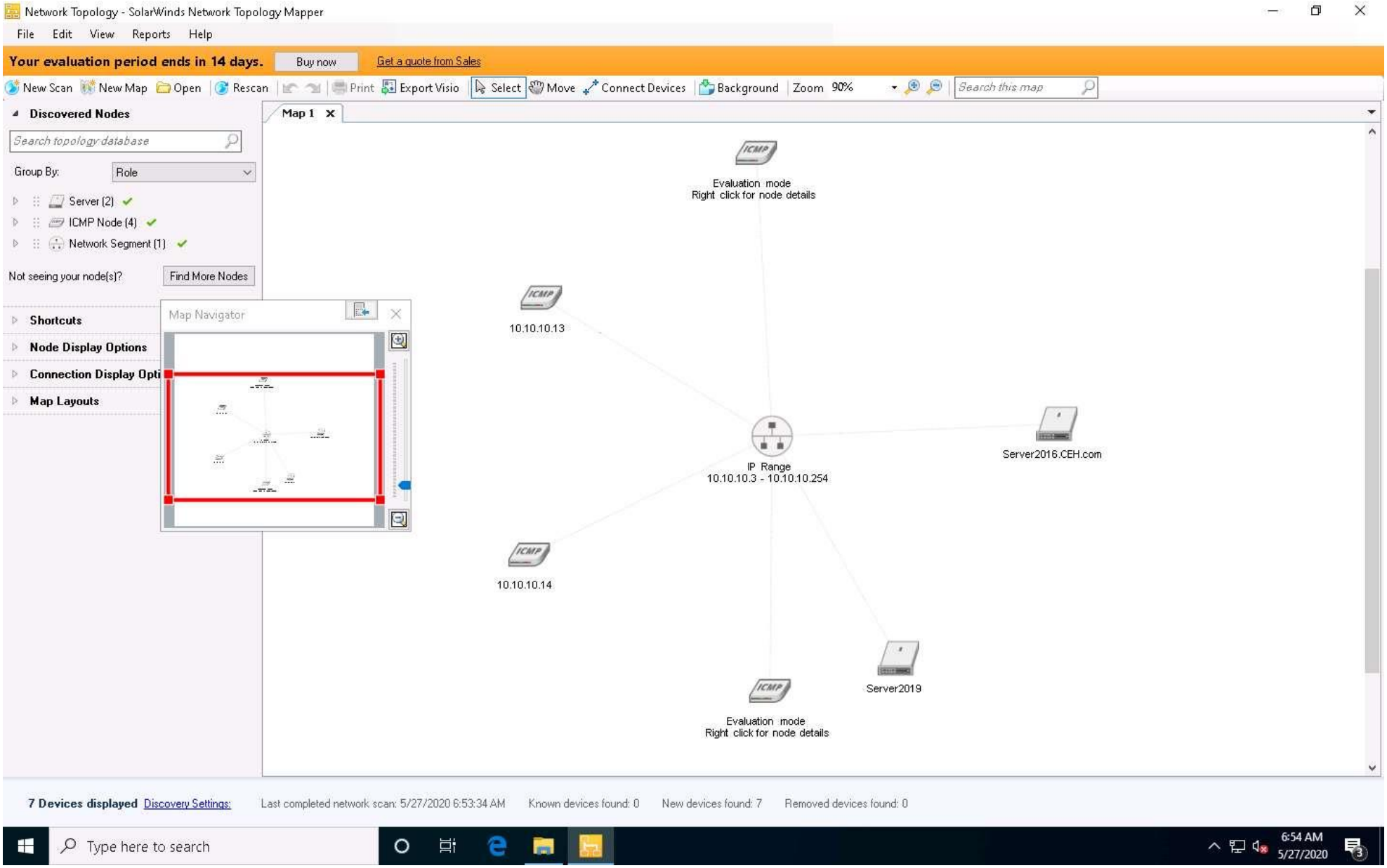
15. The **Summary** section appears; click **Discover**.



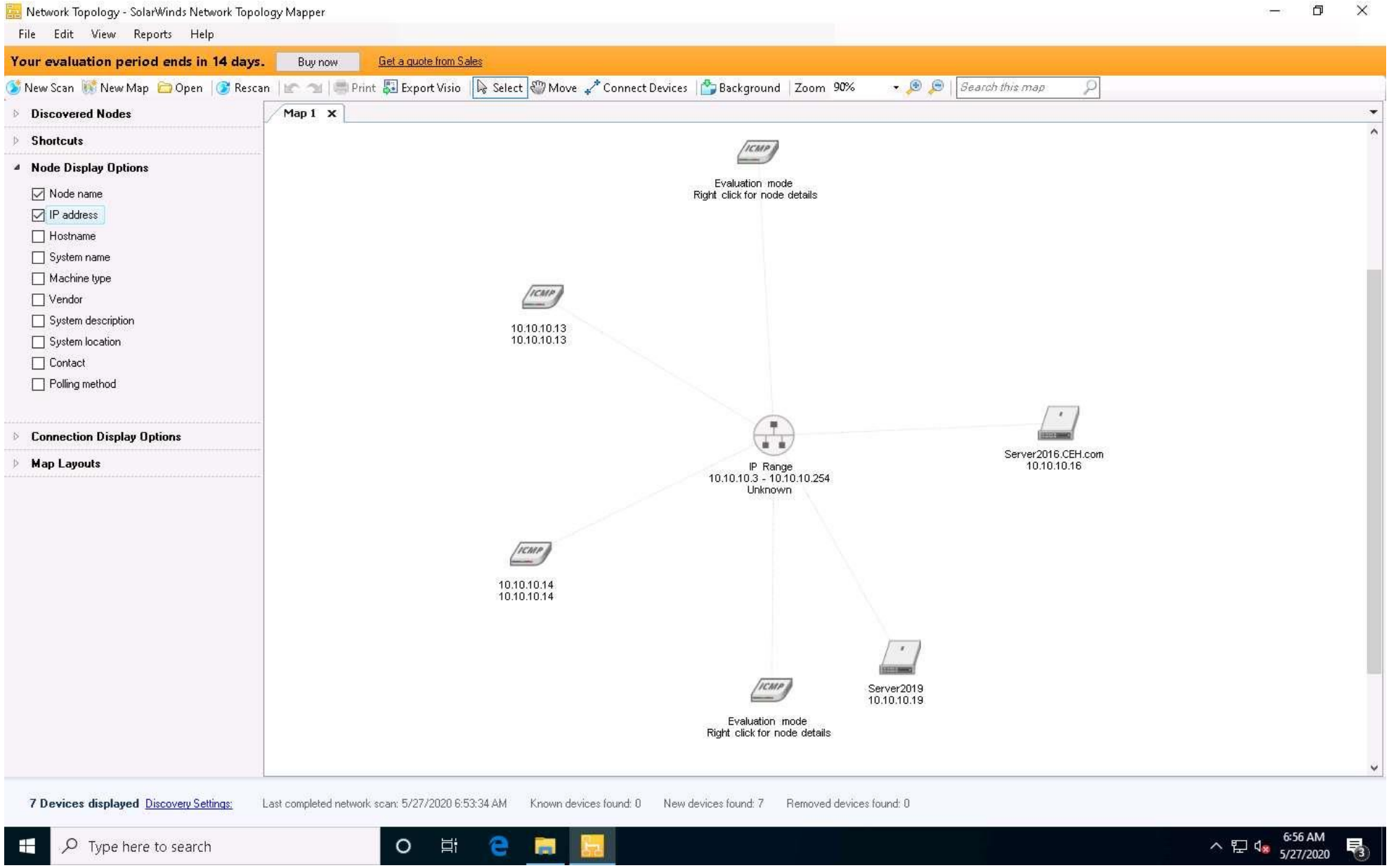
16. ☐ The **New Network Scan** window appears; the Network Topology Mapper starts scanning the network for live hosts.



17. ☐ The **Network Topology - SolarWinds Network Topology Mapper** window appears. The **Network Topology Mapper** displays a network topology diagram for the provided IP address range, as shown in the following screenshot.
18. ☐ Close the **Map Navigator** window.

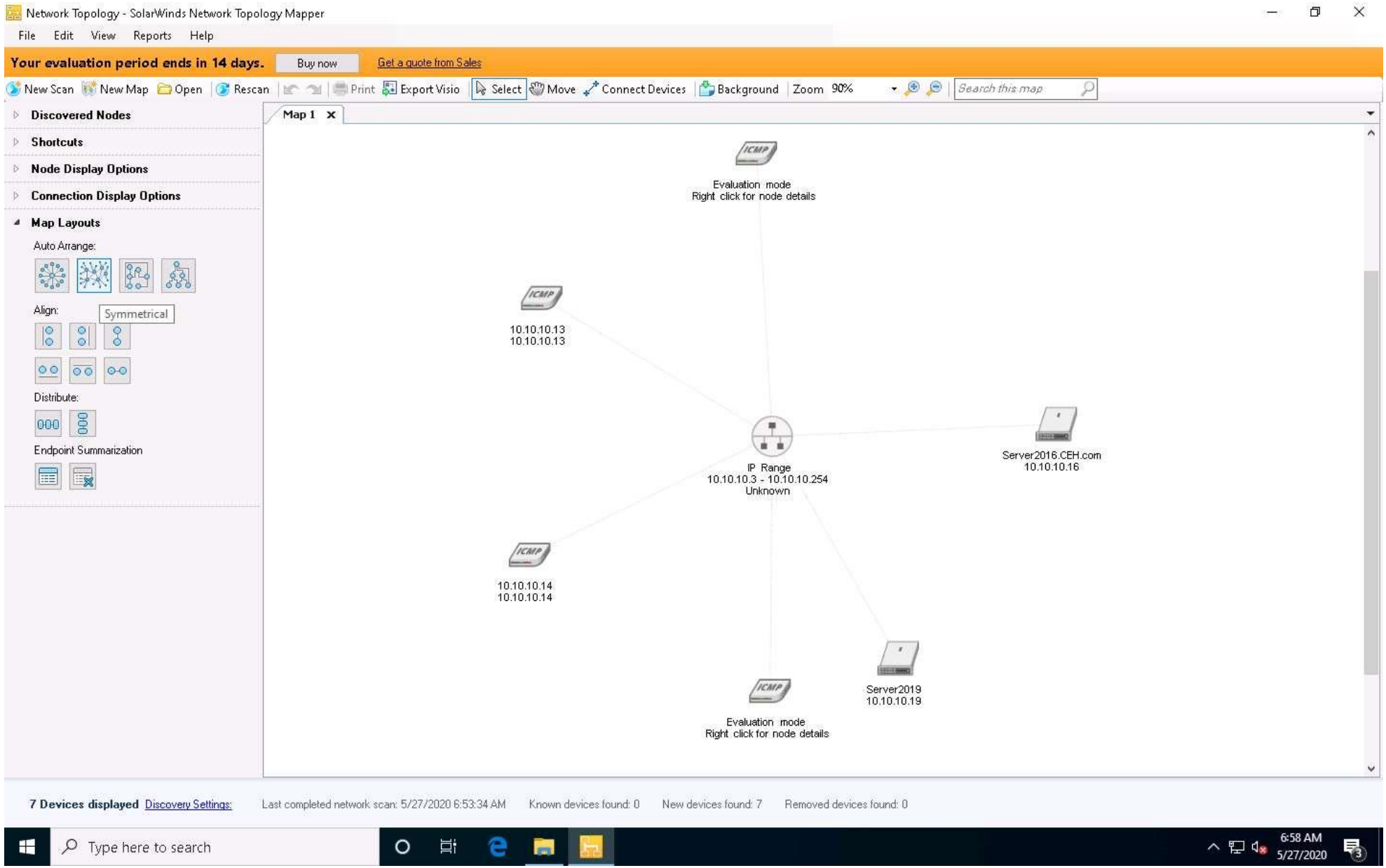


19. ☐ Expand **Node Display Options** in the right-hand pane and select the **IP address** checkbox. This displays IP addresses for all nodes in the layout.

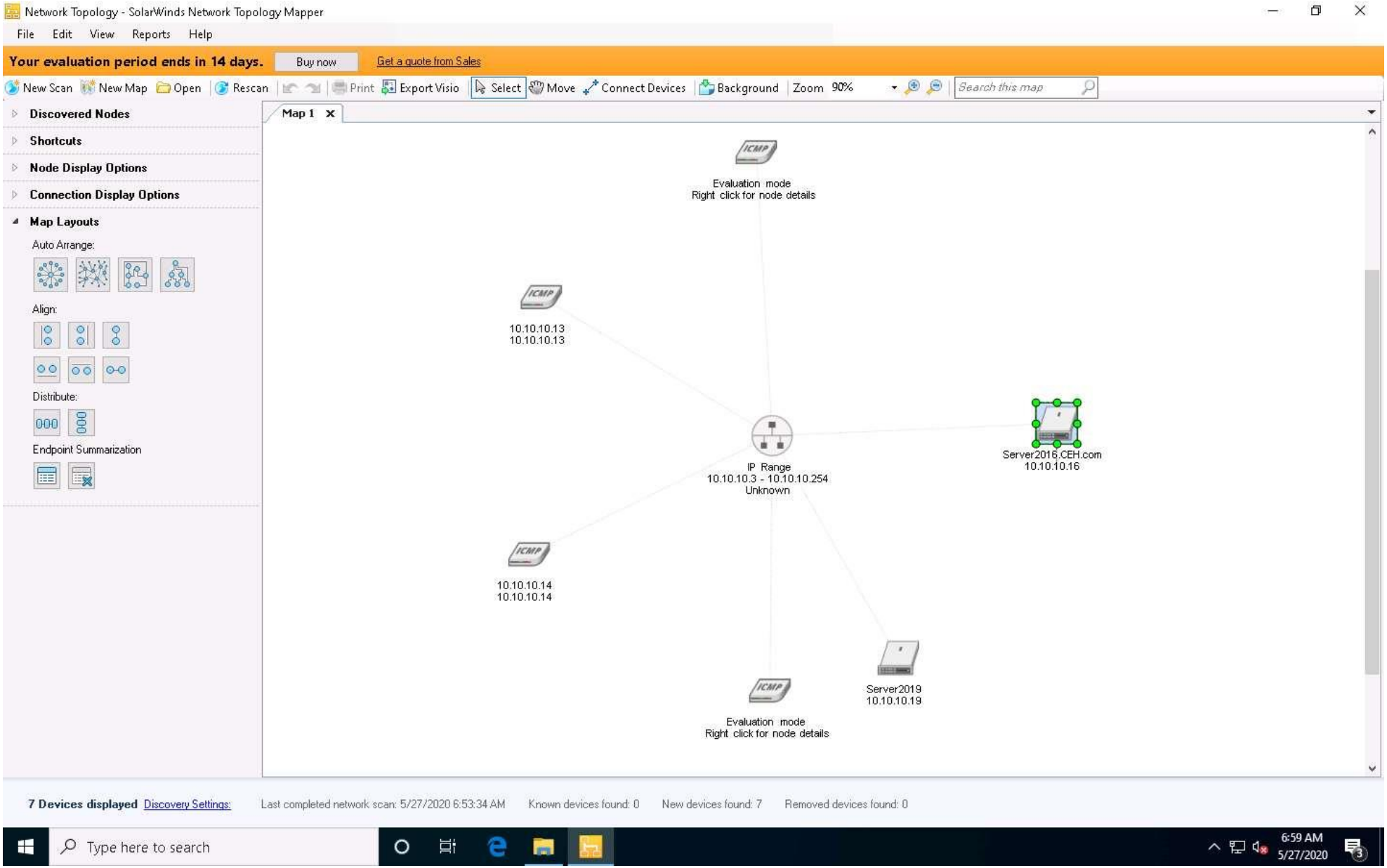


20. ☐ Now, expand the **Map Layouts** node, and select **Symmetrical** under the **Auto Arrange** section to change the topology layout of the mapped network. Each time you click **Symmetrical**, all nodes are rearranged randomly.

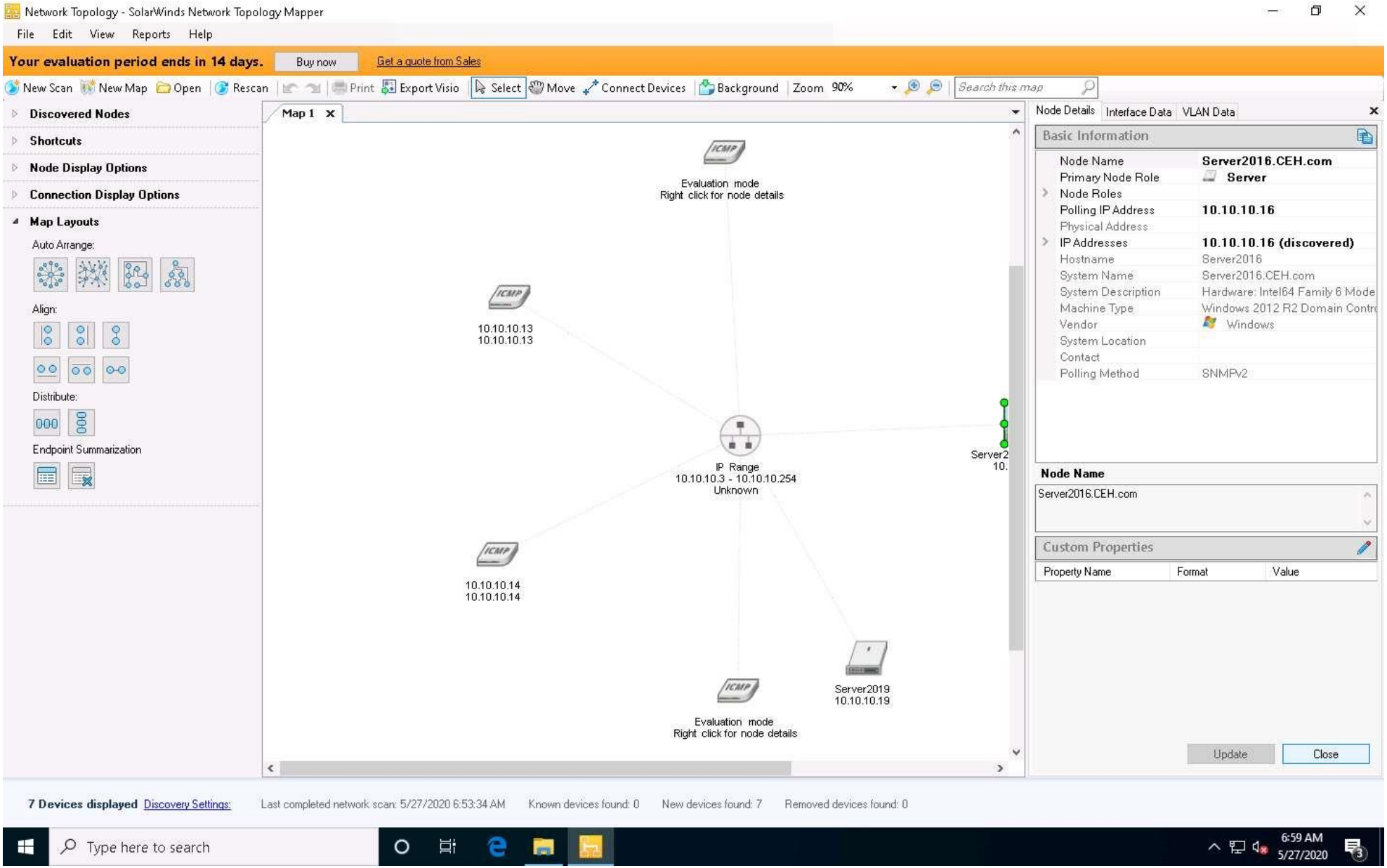
You may select the node display options of your choice: whichever options you choose, they are added to the topology map. These topology maps are saved automatically to **C:\ProgramData\Solarwinds\Network Topology Mapper\UserMaps**.



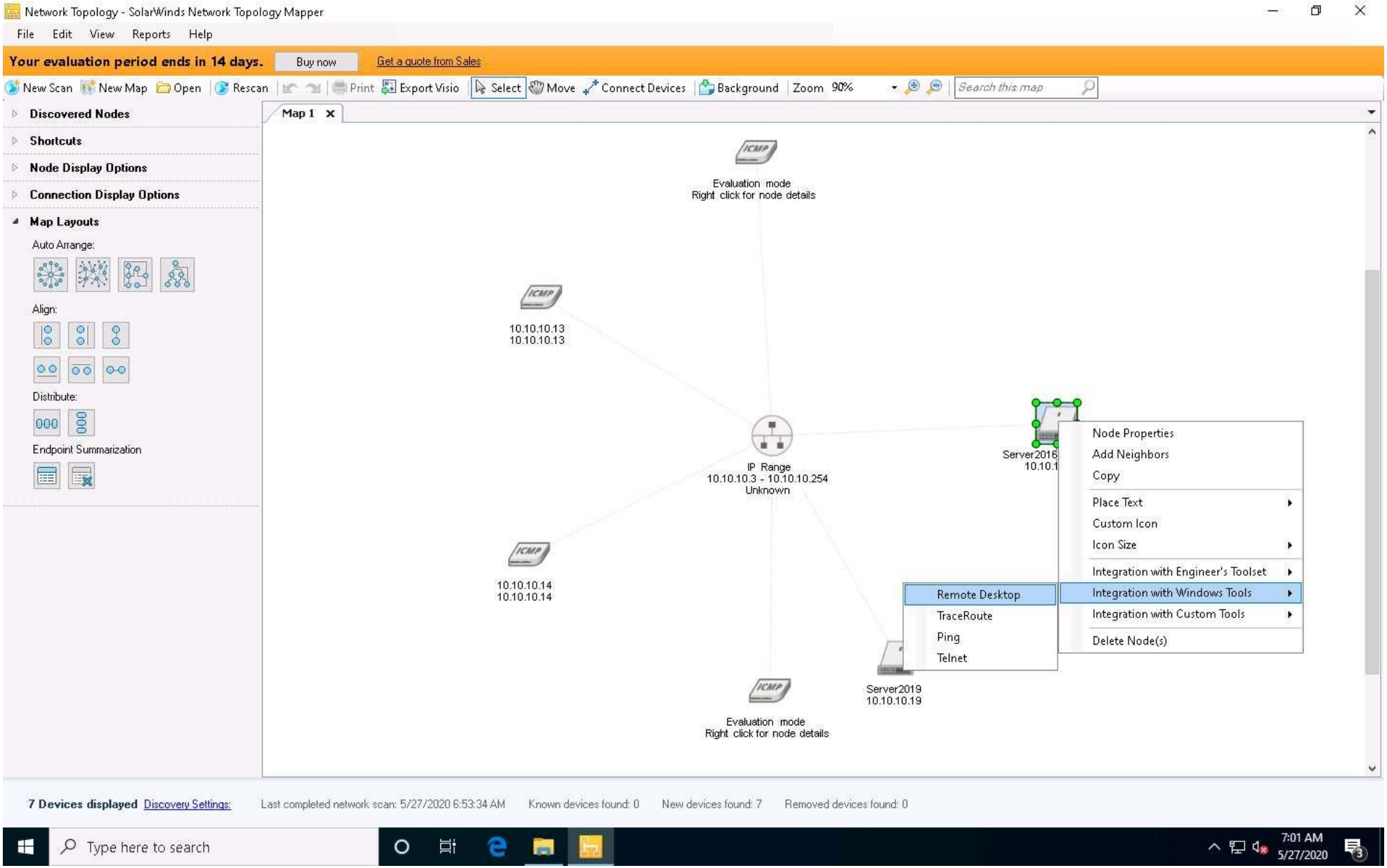
21. Right-click on a node (here **Server2016** with IP address **10.10.10.16**) and select **Node Properties** to view information about the selected node.



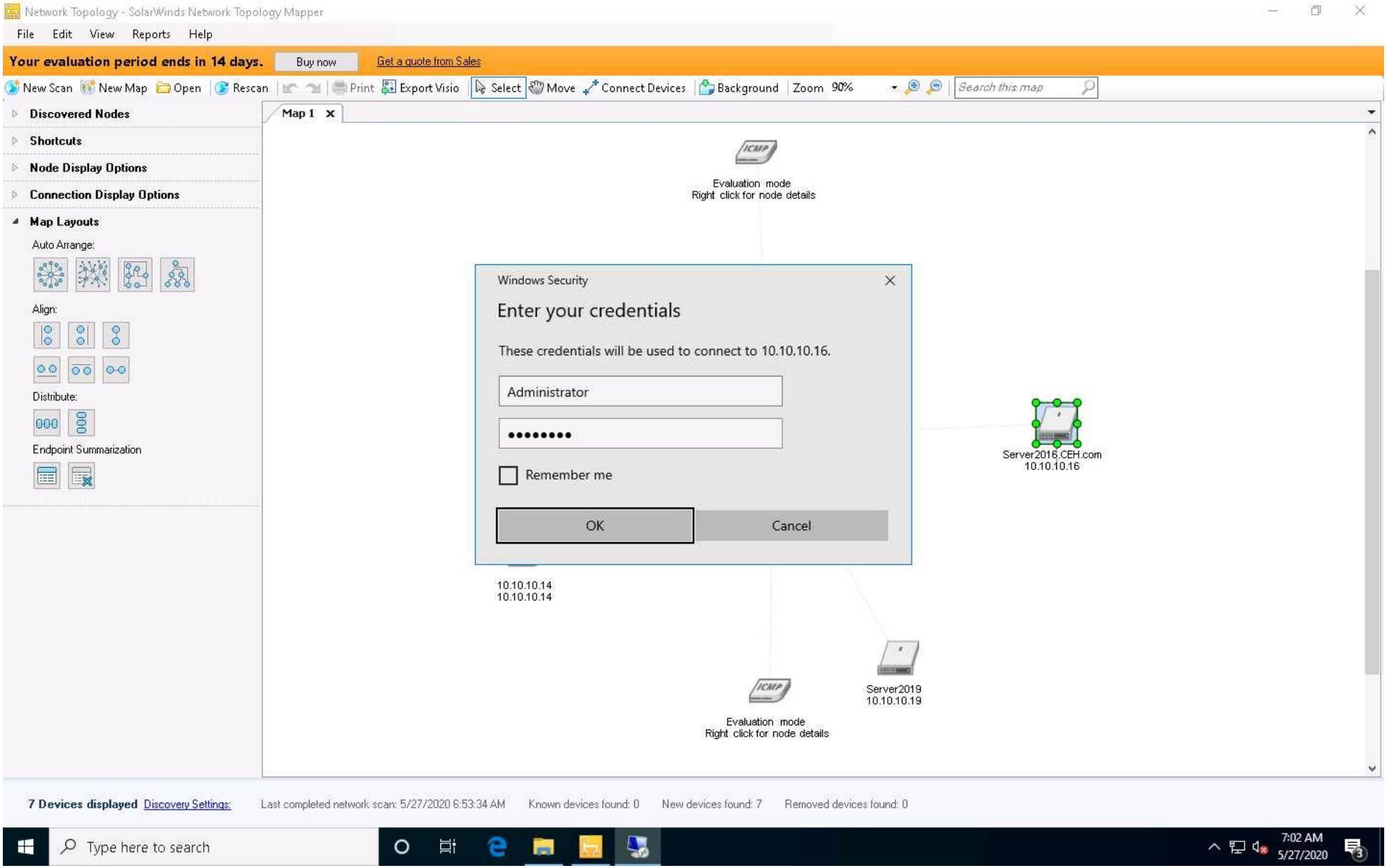
22. ☐ The **Node Details** window appears, displaying information about the selected node. Click **Close** to close the window.



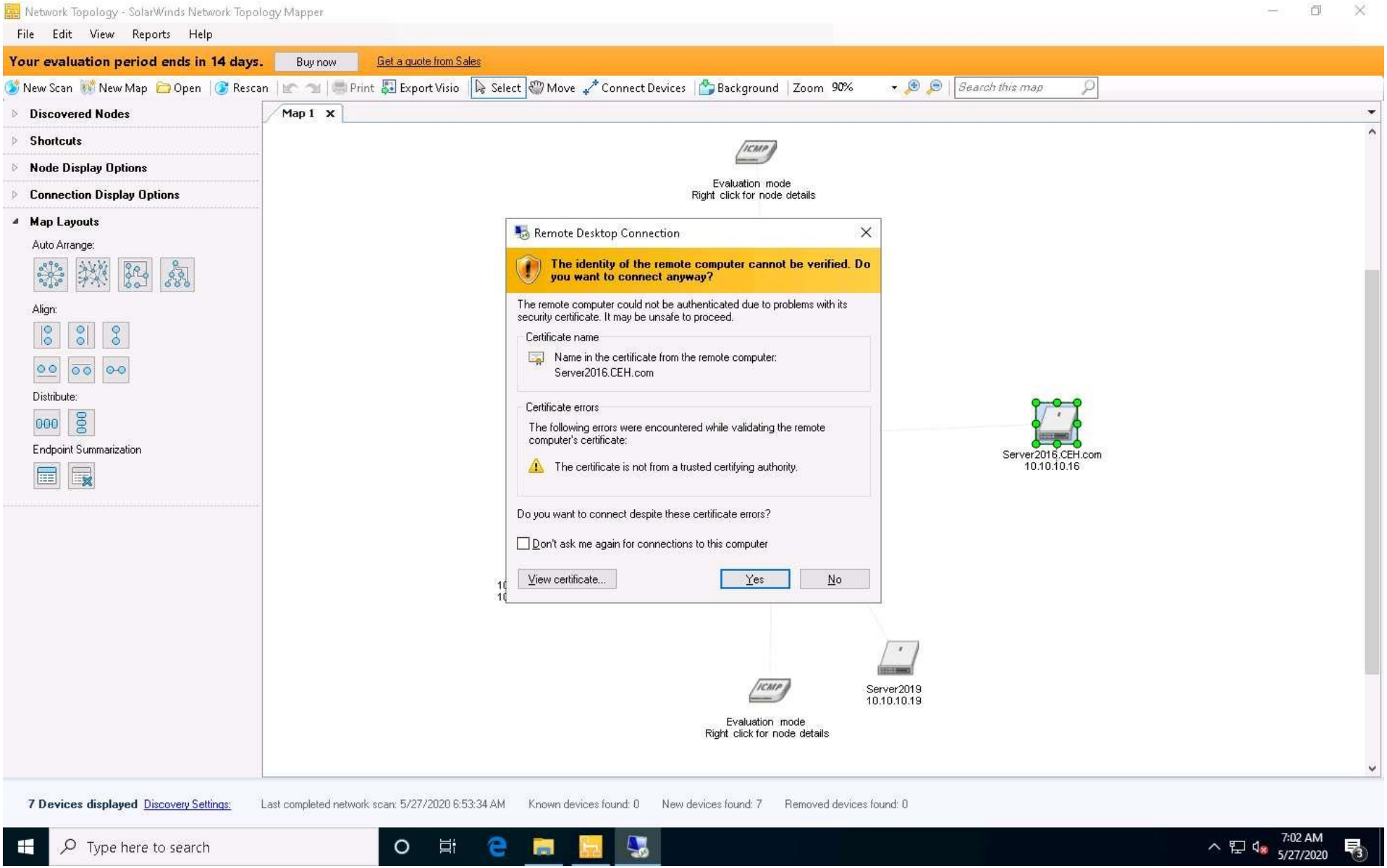
23. ☐ Right-click on a node (**Server2016** with IP address **10.10.10.16**) and select **Integration with Windows Tools** and click **Remote Desktop**.



24. ☐ The **Windows Security** dialog box appears. Enter **Username** as **Administrator** and **Password** as **Pa$$w0rd** for **Windows Server 2016**, and click **OK**.



25. ☐ The **Remote Desktop Connection** pop-up appears; click **Yes**.



26. ☐ The **Remote Desktop Connection** is successfully set to the target machine (here, **Windows Server 2016**), as shown in the following screenshot.

27. ☐ You can use other options such as **Ping**, **Telnet**, and **Traceroute**. Similarly, an attacker can use this application to draw network diagrams, find the active hosts on the network, perform Ping, Telnet, etc.
28. ☐ This concludes the demonstration of drawing network diagram of the target network using Network Topology Mapper.
29. ☐ You can also use other network discovery tools such as **OpManager** (https://www.manageengine.com), **The Dude** (https://mikrotik.com), **NetSurveyor** (http://nutsaboutnets.com), **NetBrain** (https://www.netbraintech.com), and **Spiceworks Network Mapping Tool** (https://www.spiceworks.com) to draw network diagram of the target network.
30. ☐ Close all open windows and document all the acquired information.