Lab 7: Perform Enumeration using Various Enumeration Tools

Lab Scenario

The details obtained in the previous steps might not reveal all potential vulnerabilities in the target network. There may be more information available that could help attackers to identify loopholes to exploit. As an ethical hacker, you should use a range of tools to find as much information as possible about the target network's systems. This lab activity will demonstrate further enumeration tools for extracting even more information about the target system.

Lab Objectives

- Enumerate information using Global Network Inventory
- Enumerate network resources using Advanced IP Scanner
- Enumerate information from Windows and Samba host using Enum4linux

Overview of Enumeration Tools

To recap what you have learned so far, enumeration tools are used to collect detailed information about target systems in order to exploit them. The information collected by these enumeration tools includes data on the NetBIOS service, usernames and domain names, shared folders, the network (such as ARP tables, routing tables,traffic, etc.), user accounts, directory services, etc.

Task 1: Enumerate Information using Global Network Inventory

Global Network Inventory is used as an audit scanner in zero deployment and agent-free environments. It scans single or multiple computers by IP range or domain, as defined by the Global Network Inventory host file.

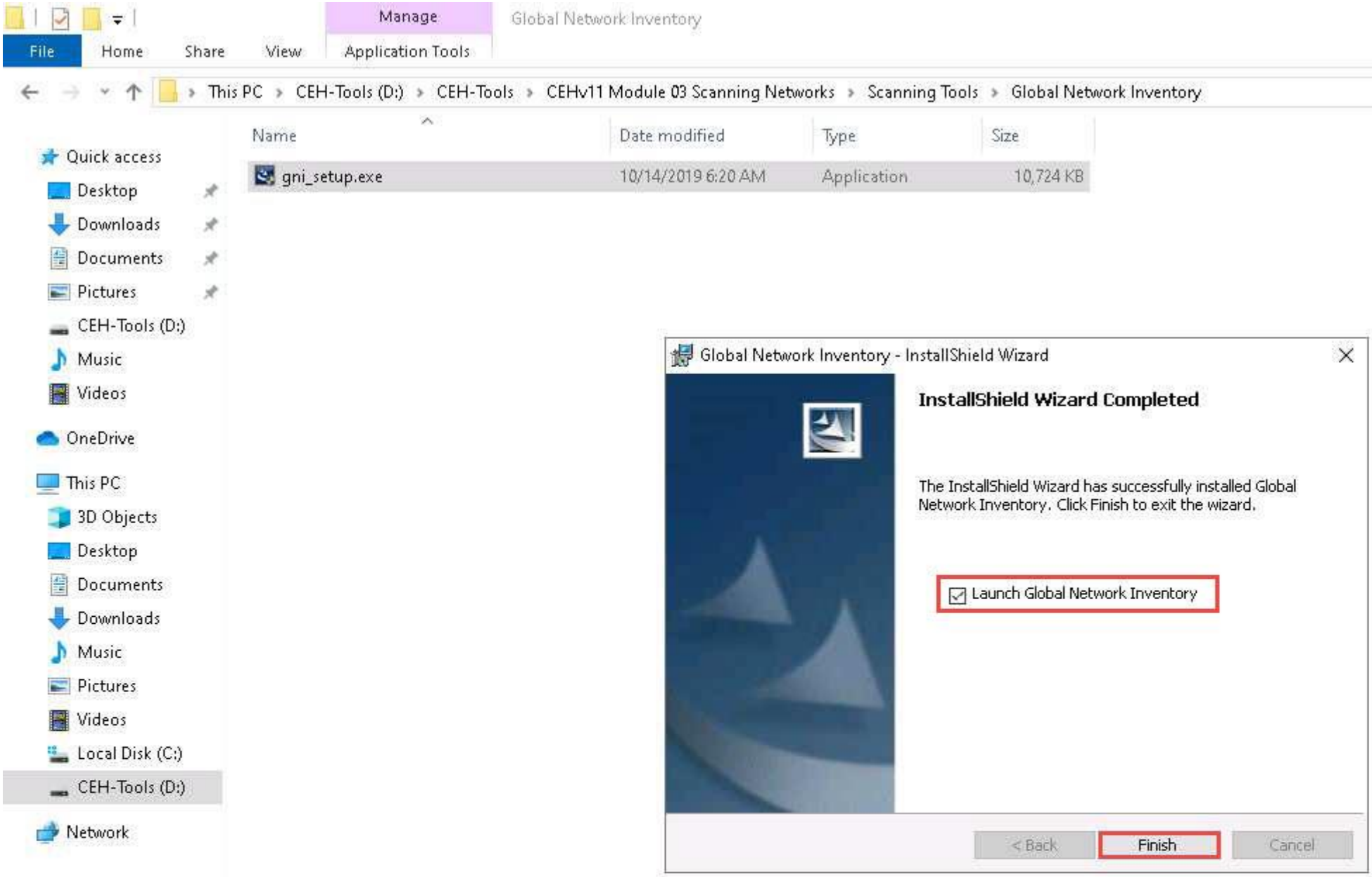
Here, we will use the Global Network Inventory to enumerate various types of data from a target IP address range or single IP.

1. Click Windows 10 to switch to the **Windows 10** machine, navigate to **D:\CEH-Tools\CEHv11 Module 03 Scanning Networks\Scanning Tools\Global Network Inventory**; then, double-click **gni_setup.exe**.

   If a **User Account Control** pop-up appears, click **Yes**.

2. The **Global Network Inventory - InstallShield Wizard** appears. Follow the steps to install the application, using the default settings.

3. On completing the installation, ensure that the **Launch Global Network Inventory** checkbox is selected in the **Global Network Inventory - InstallShield Wizard** window; click **Finish**.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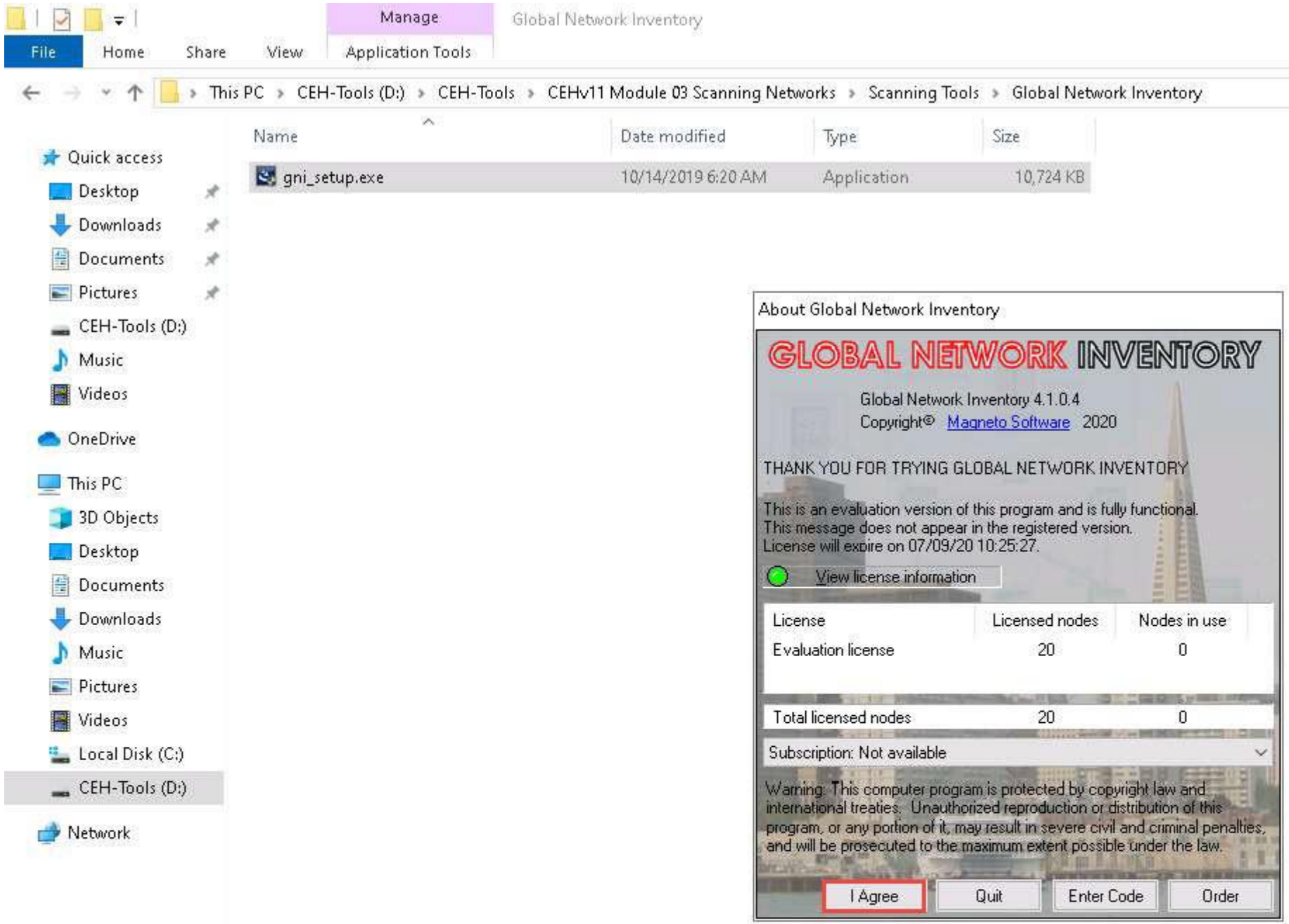
CEH-Tools (D:)
Network
Name
Date modified
Type
Size
gni_setup.exe
10/14/2019 6:20 AM
Application
10,724 KB
Global Network Inventory - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Global Network Inventory. Click Finish to exit the wizard.
Launch Global Network Inventory
< Back
Finish
Cancel

4. The **About Global Network Inventory** wizard appears; click **I Agree**.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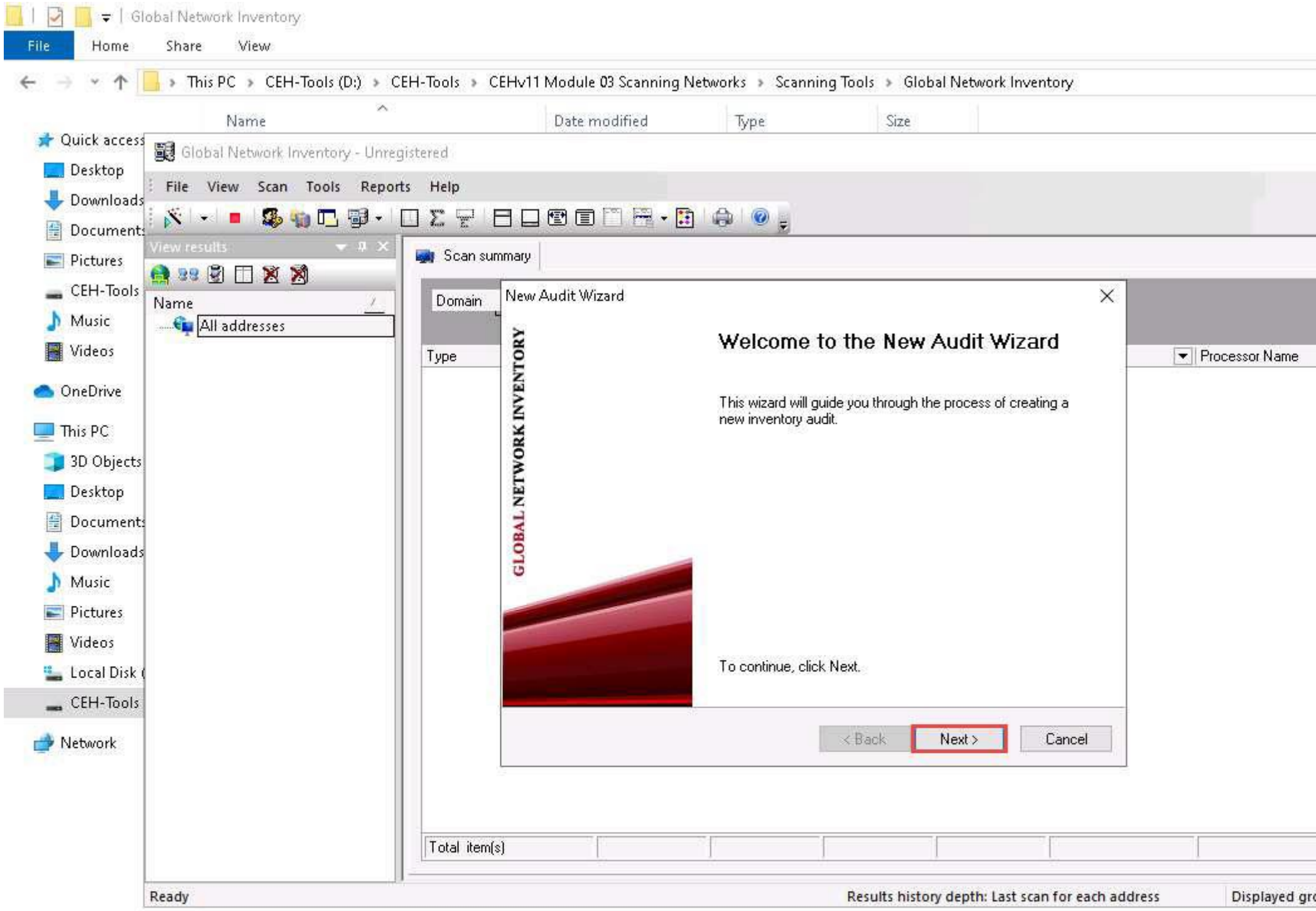
Network
Name
Date modified
Type
Size
gni_setup.exe
10/14/2019 6:20 AM
Application
10,724 KB
About Global Network Inventory
GLOBAL NETWORK INVENTORY
Global Network Inventory 4.1.0.4
Copyright© Magneto Software 2020
THANK YOU FOR TRYING GLOBAL NETWORK INVENTORY
This is an evaluation version of this program and is fully functional.
This message does not appear in the registered version.
License will expire on 07/09/20 10:25:27.
View license information
License
Licensed nodes
Nodes in use
Evaluation license
20
0
Total licensed nodes
20
0
Subscription: Not available
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.
I Agree
Quit
Enter Code
Order

5. ☐ The **Global Network Inventory** GUI appears. Click **Close** on the **Tip of the Day** pop-up.
6. ☐ The **New Audit Wizard** window appears; click **Next**.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Scan
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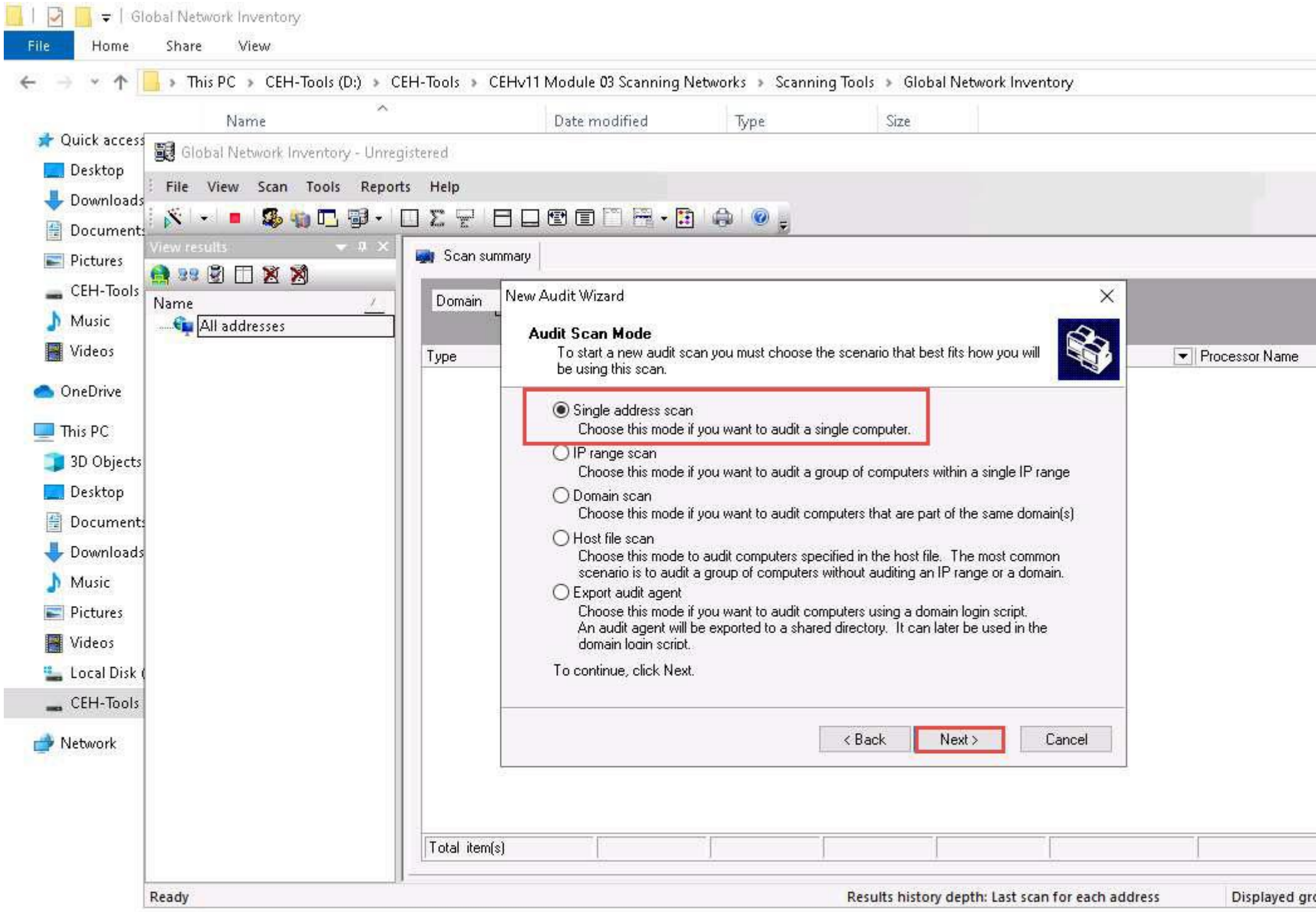
View results
Name
All addresses
Scan summary
Domain
Type
Processor Name
New Audit Wizard
GLOBAL NETWORK INVENTORY
Welcome to the New Audit Wizard
This wizard will guide you through the process of creating a new inventory audit.
To continue, click Next.
< Back
Next >
Cancel
Total item(s)
Ready
Results history depth: Last scan for each address
Displayed gro

7. Under the **Audit Scan Mode** section, click the **Single address scan** radio button, and then click **Next**.

You can also scan an IP range by clicking on the **IP range scan** radio button, after which you will specify the target IP range.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CEH-Tools
Network
Global Network Inventory - Unregistered
File
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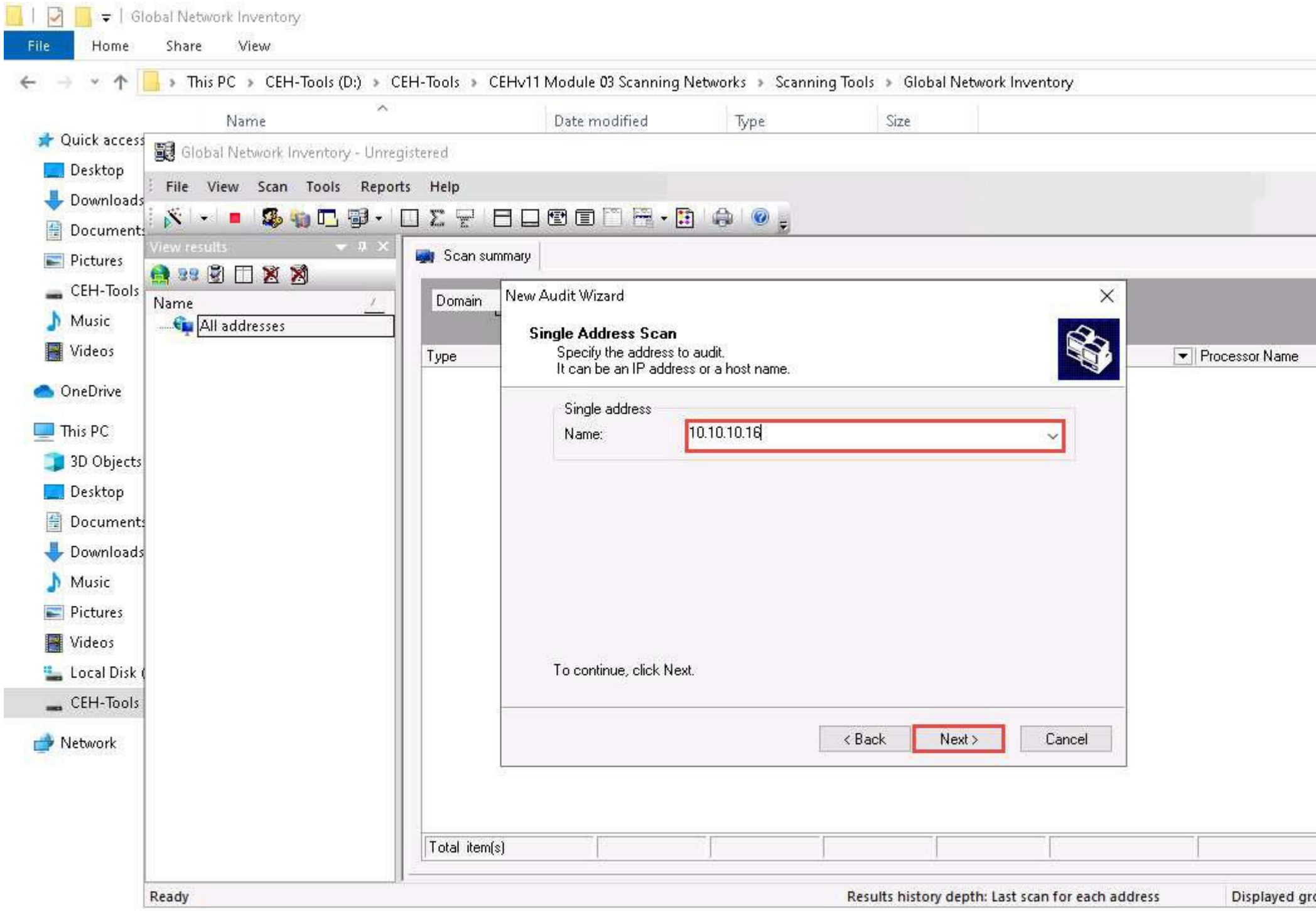
Help
View results
Name
All addresses
Scan summary
Domain
Type
Processor Name
New Audit Wizard
Audit Scan Mode
To start a new audit scan you must choose the scenario that best fits how you will be using this scan.
Single address scan
Choose this mode if you want to audit a single computer.
IP range scan
Choose this mode if you want to audit a group of computers within a single IP range
Domain scan
Choose this mode if you want to audit computers that are part of the same domain(s)
Host file scan
Choose this mode to audit computers specified in the host file. The most common scenario is to audit a group of computers without auditing an IP range or a domain.
Export audit agent
Choose this mode if you want to audit computers using a domain login script. An audit agent will be exported to a shared directory. It can later be used in the domain login script.
To continue, click Next.
< Back
Next >
Cancel
Total item(s)
Ready
Results history depth: Last scan for each address
Displayed gro

8. Under the **Single Address Scan** section, specify the target IP address in the **Name** field of the **Single address** option (in this example, the target IP address is **10.10.10.16**); Click **Next**.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Network
Global Network Inventory - Unregistered
File
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Scan
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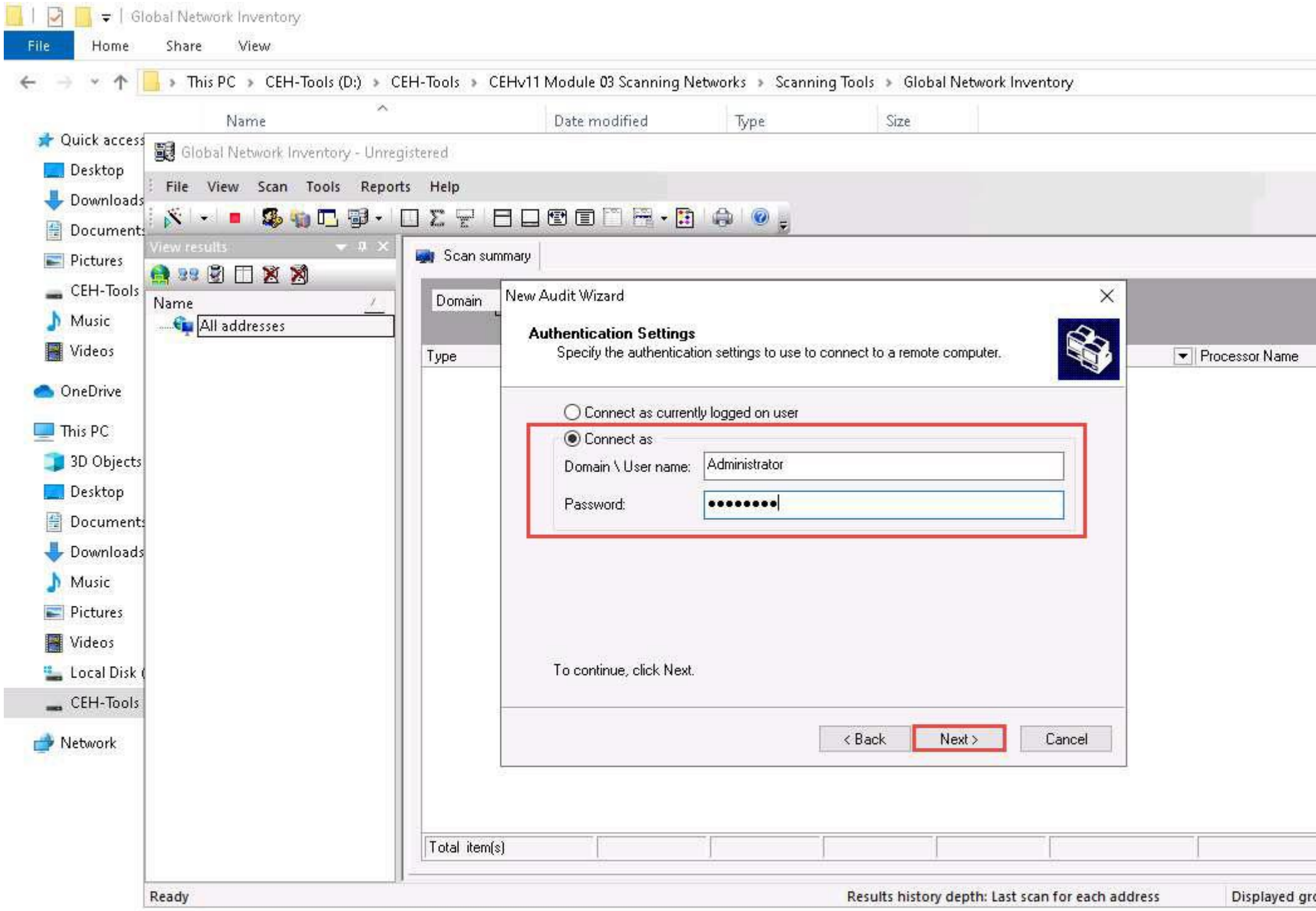
Reports
Help
View results
Name
All addresses
Scan summary
Domain
Type
Processor Name
New Audit Wizard
Single Address Scan
Specify the address to audit.
It can be an IP address or a host name.
Single address
Name:
10.10.10.16
To continue, click Next.
< Back
Next >
Cancel
Total item(s)
Ready
Results history depth: Last scan for each address

9. The next section is **Authentication Settings**; select the **Connect as** radio button and enter the **Windows Server 2016** machine credentials (Domain\Username: **Administrator** and Password: **Pa$$w0rd**), and then click **Next**.

In reality, attackers do not know the credentials of the remote machine(s). In this situation, they choose the **Connect as currently logged on user** option and perform a scan to determine which machines are active in the network. With this option, they will not be able to extract all the information about the target system. Because this lab is just for assessment purposes, we have entered the credentials of the remote machine directly.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Global Network Inventory - Unregistered
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View results
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All addresses
Scan summary
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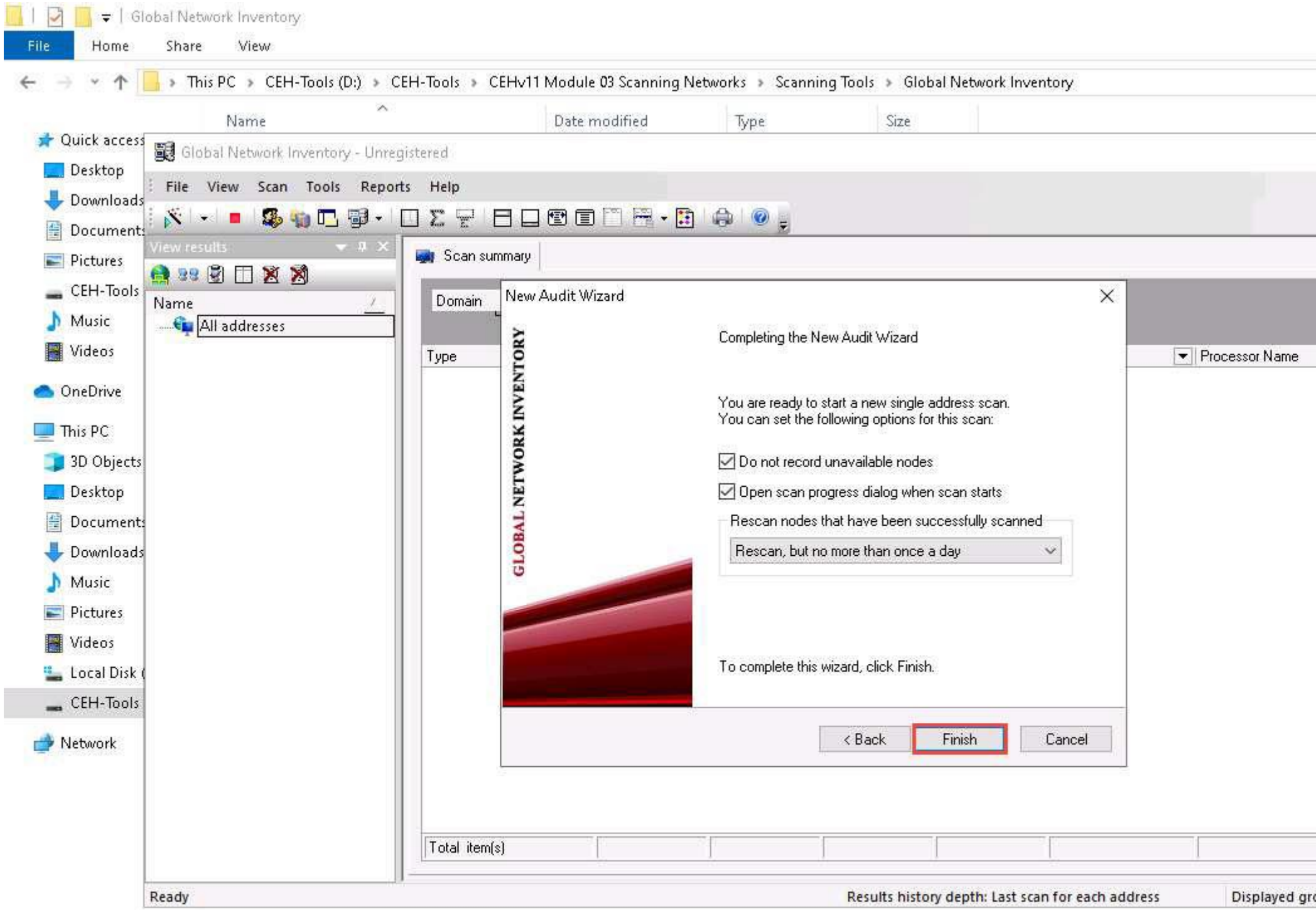
Processor Name
New Audit Wizard
Authentication Settings
Specify the authentication settings to use to connect to a remote computer.
Connect as currently logged on user
Connect as
Domain \ User name:
Administrator
Password:
To continue, click Next.
< Back
Next >
Cancel
Total item(s)
Ready
Results history depth: Last scan for each address
Displayed gro

10. ☐ In the final step of the wizard, leave the default settings unchanged and click **Finish**.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Reports
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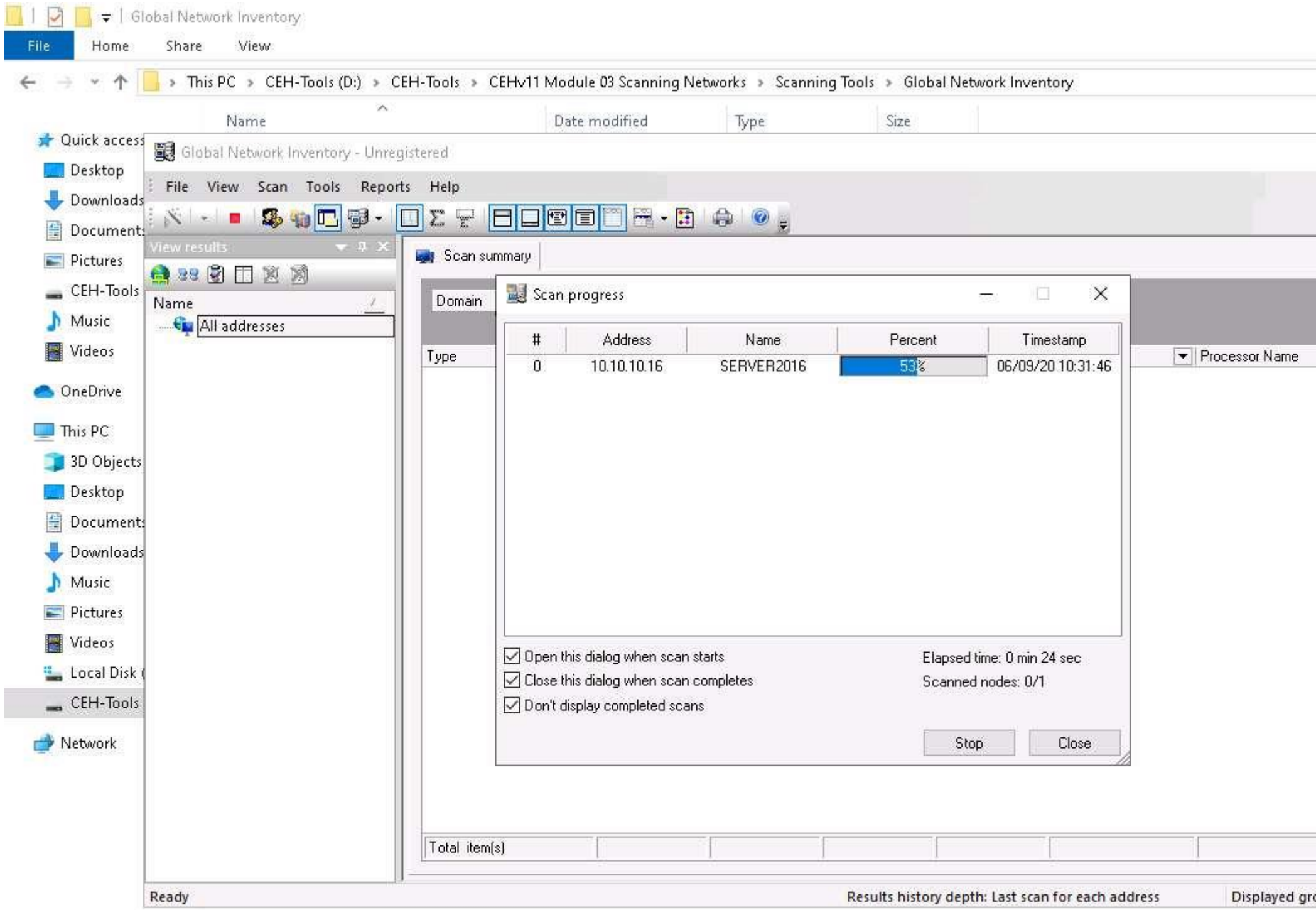
View results
Name
All addresses
Scan summary
Domain
Type
Processor Name
New Audit Wizard
GLOBAL NETWORK INVENTORY
Completing the New Audit Wizard
You are ready to start a new single address scan.
You can set the following options for this scan:
Do not record unavailable nodes
Open scan progress dialog when scan starts
Rescan nodes that have been successfully scanned
Rescan, but no more than once a day
To complete this wizard, click Finish.
< Back
Finish
Cancel
Total item(s)
Ready
Results history depth: Last scan for each address
Displayed gro

11. ☐ The **Scan progress** window will appear.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Help
View results
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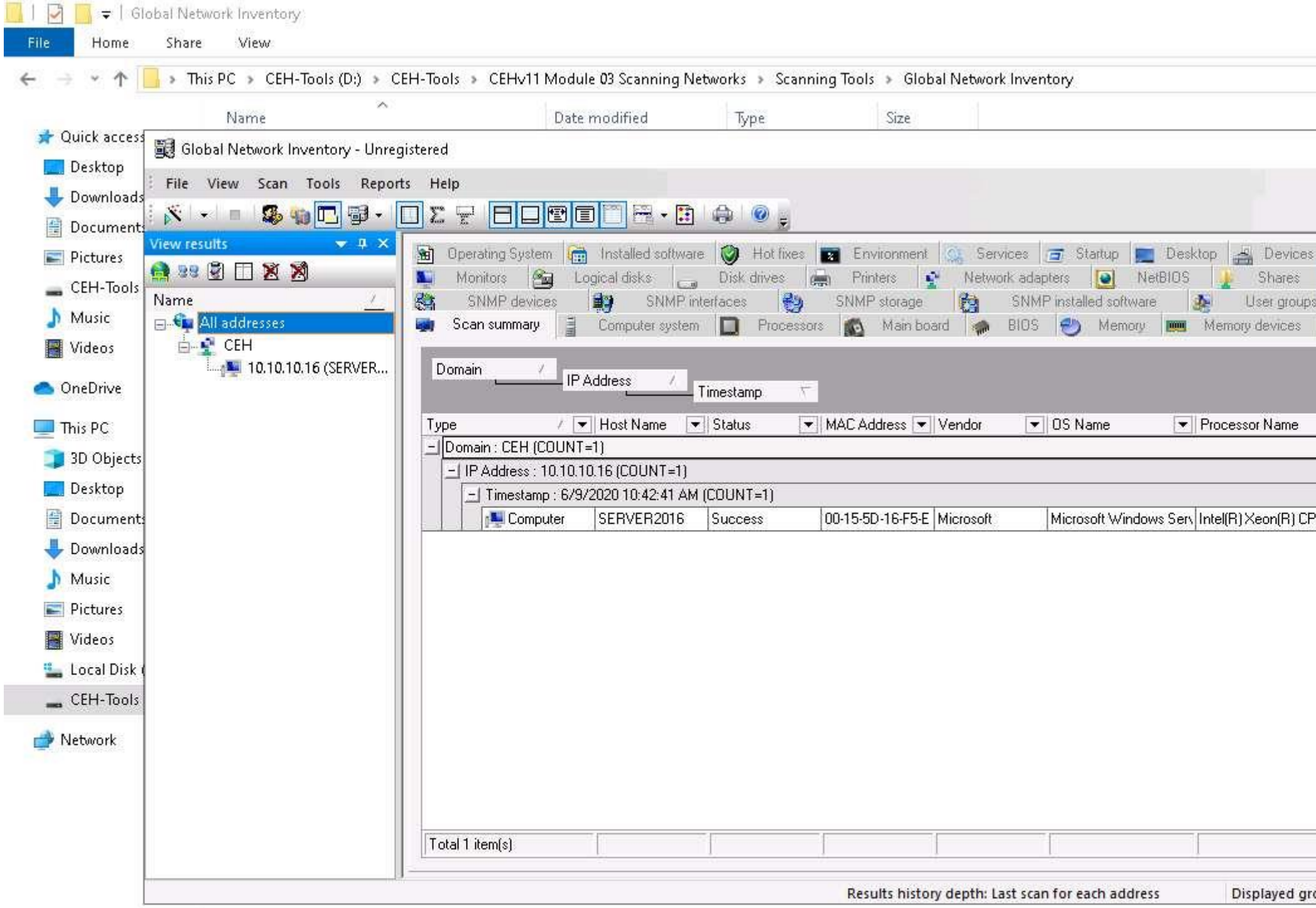
All addresses
Scan summary
Domain
Type
Processor Name
Scan progress
#
Address
Name
Percent
Timestamp
0
10.10.10.16
SERVER2016
53%
06/09/20 10:31:46
Open this dialog when scan starts
Close this dialog when scan completes
Don't display completed scans
Elapsed time: 0 min 24 sec
Scanned nodes: 0/1
Stop
Close
Total item(s)
Ready
Results history depth: Last scan for each address
Displayed gro

12. ☐ The results are displayed when the scan finished. The **Scan summary** of the scanned target IP address (**10.10.10.16**) appears.

> The scan result and summary in each tab might vary in your lab environment.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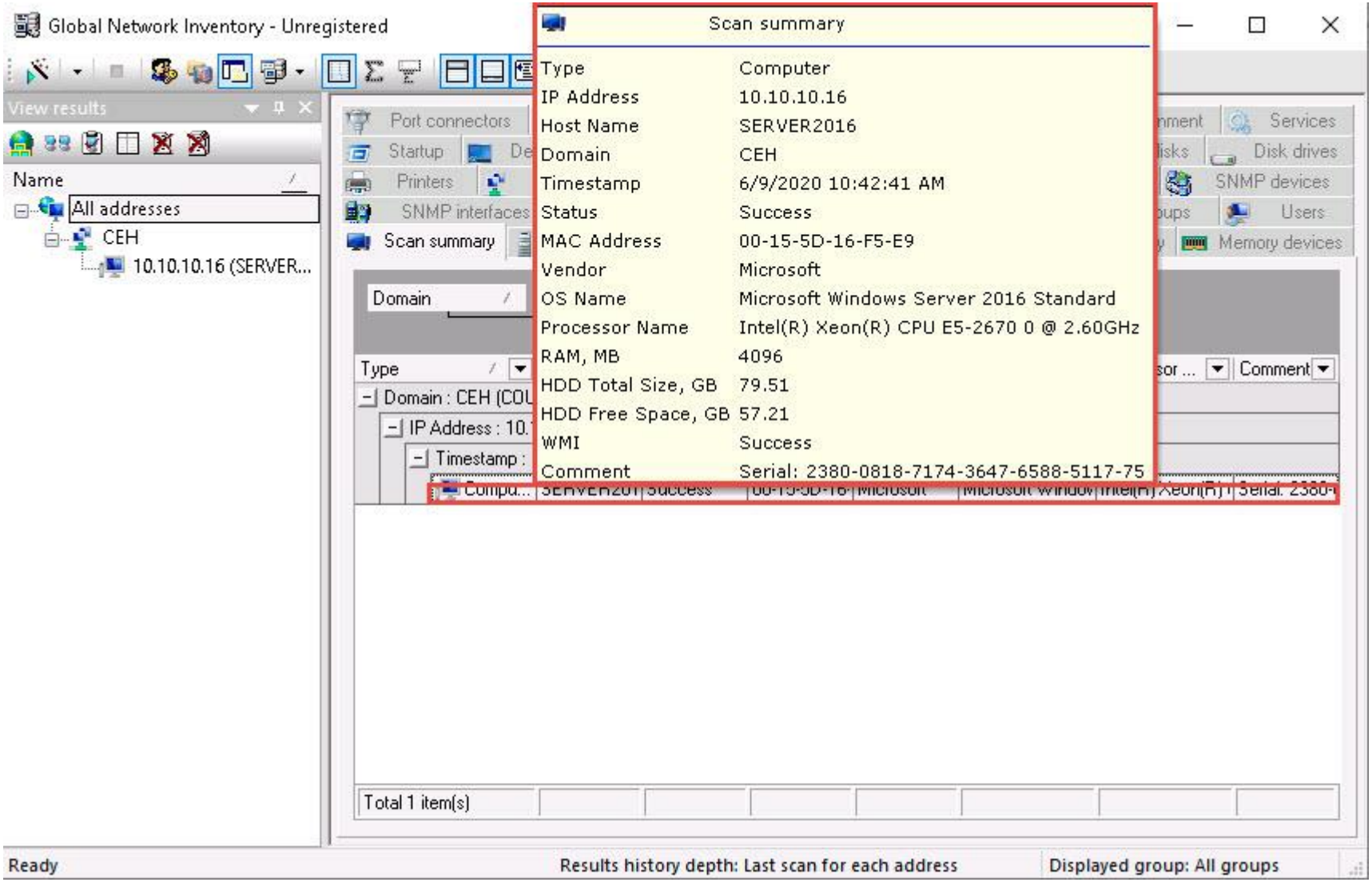
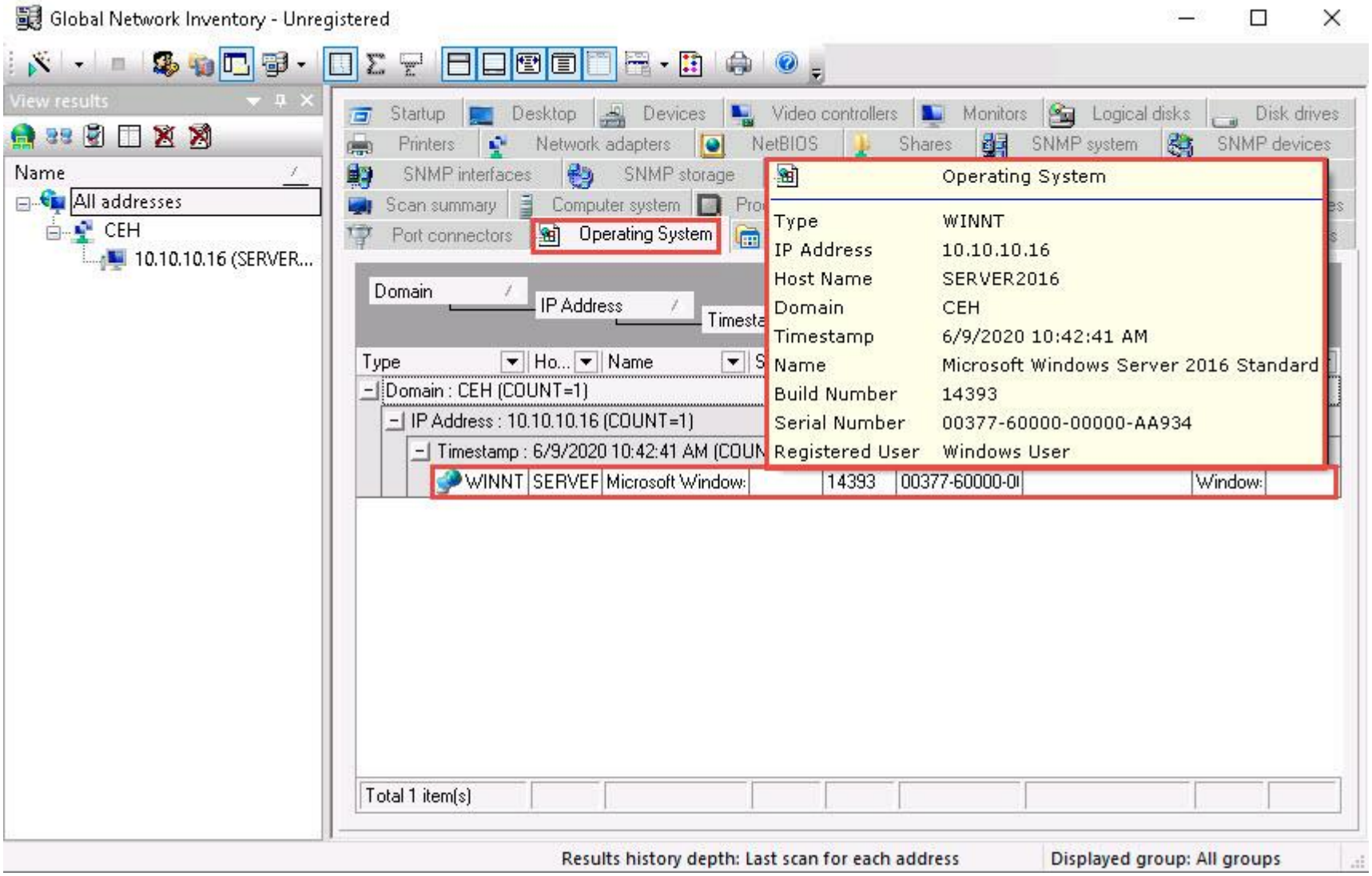
10.10.10.16 (SERVER...
Operating System
Installed software
Hot fixes
Environment
Services
Startup
Desktop
Devices
Monitors
Logical disks
Disk drives
Printers
Network adapters
NetBIOS
Shares
SNMP devices
SNMP interfaces
SNMP storage
SNMP installed software
User groups
Scan summary
Computer system
Processors
Main board
BIOS
Memory
Memory devices
Domain
IP Address
Timestamp
Type
Host Name
Status
MAC Address
Vendor
OS Name
Processor Name
Domain : CEH (COUNT=1)
IP Address : 10.10.10.16 (COUNT=1)
Timestamp : 6/9/2020 10:42:41 AM (COUNT=1)
Computer
SERVER2016
Success
00-15-5D-16-F5-E
Microsoft
Microsoft Windows Ser
Intel(R) Xeon(R) CP
Total 1 item(s)
Results history depth: Last scan for each address
Displayed gr

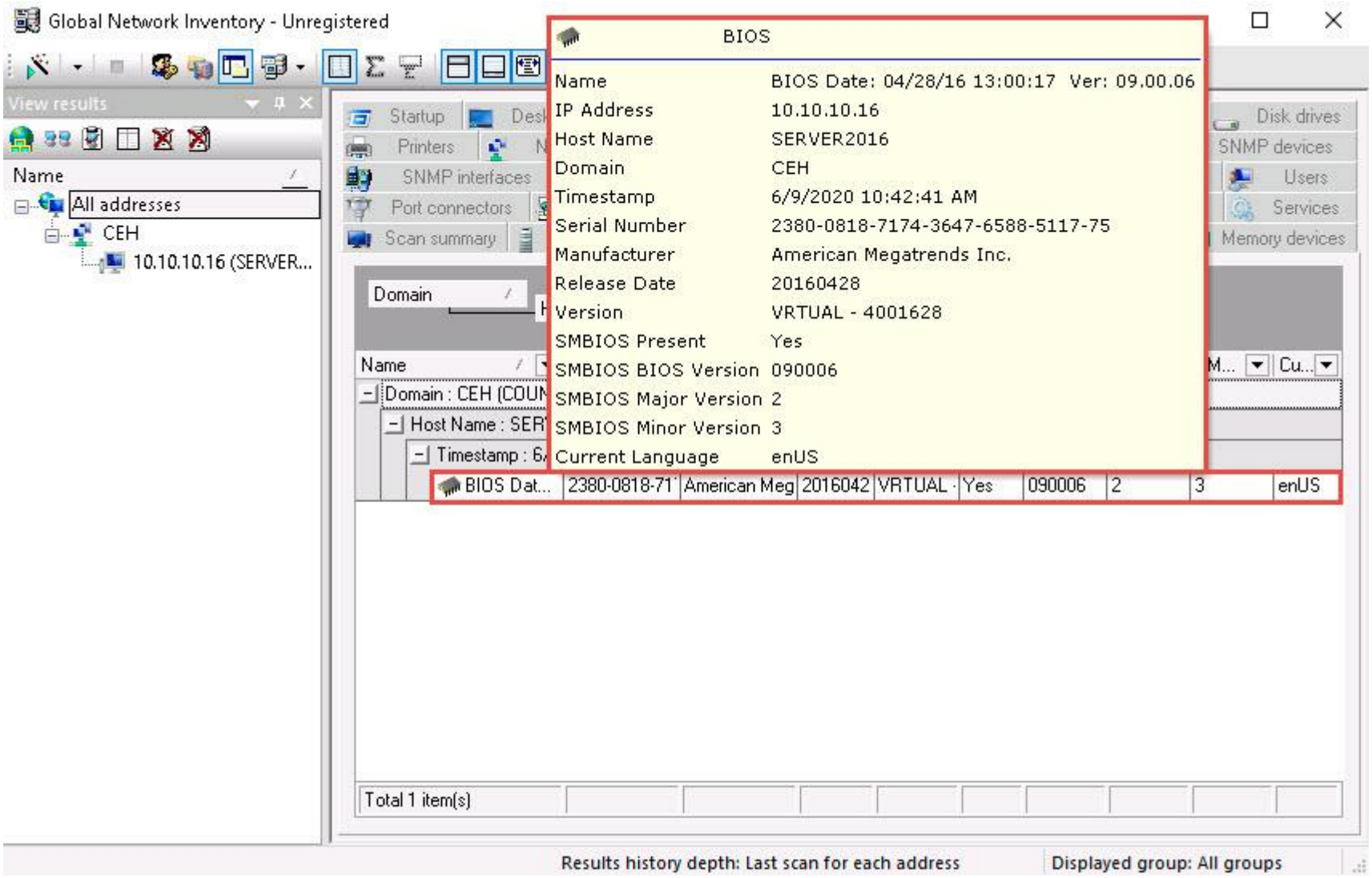
13. Hover your mouse cursor over the **Computer details** under the Scan summary tab to view the **scan summary**, as shown in the screenshot.



14. Click the **Operating System** tab and hover the mouse cursor over **Windows details** to view the complete details of the machine.

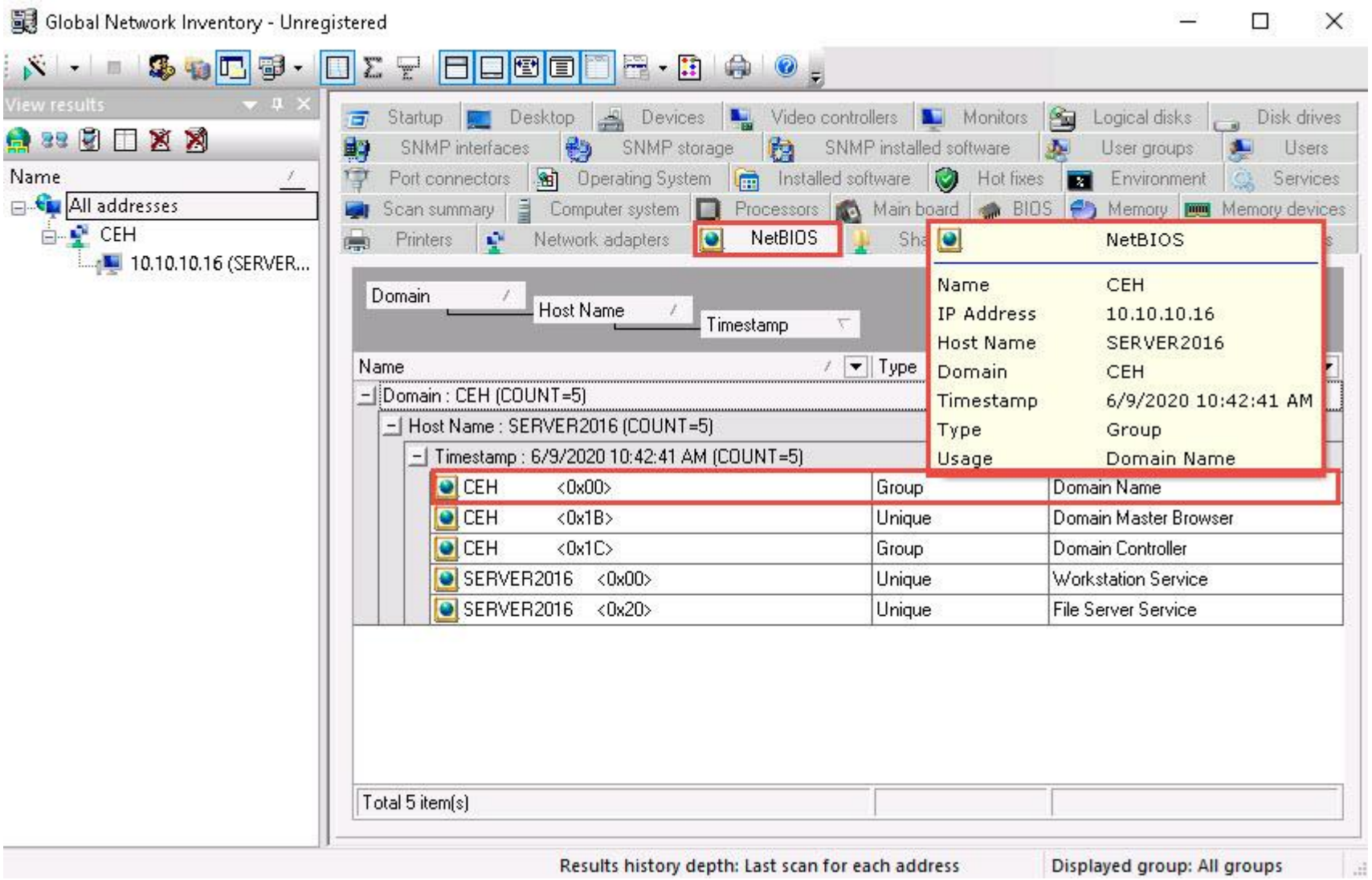


15. ☐ Click the **BIOS** tab, and hover the mouse cursor over windows details to display detailed BIOS settings information.



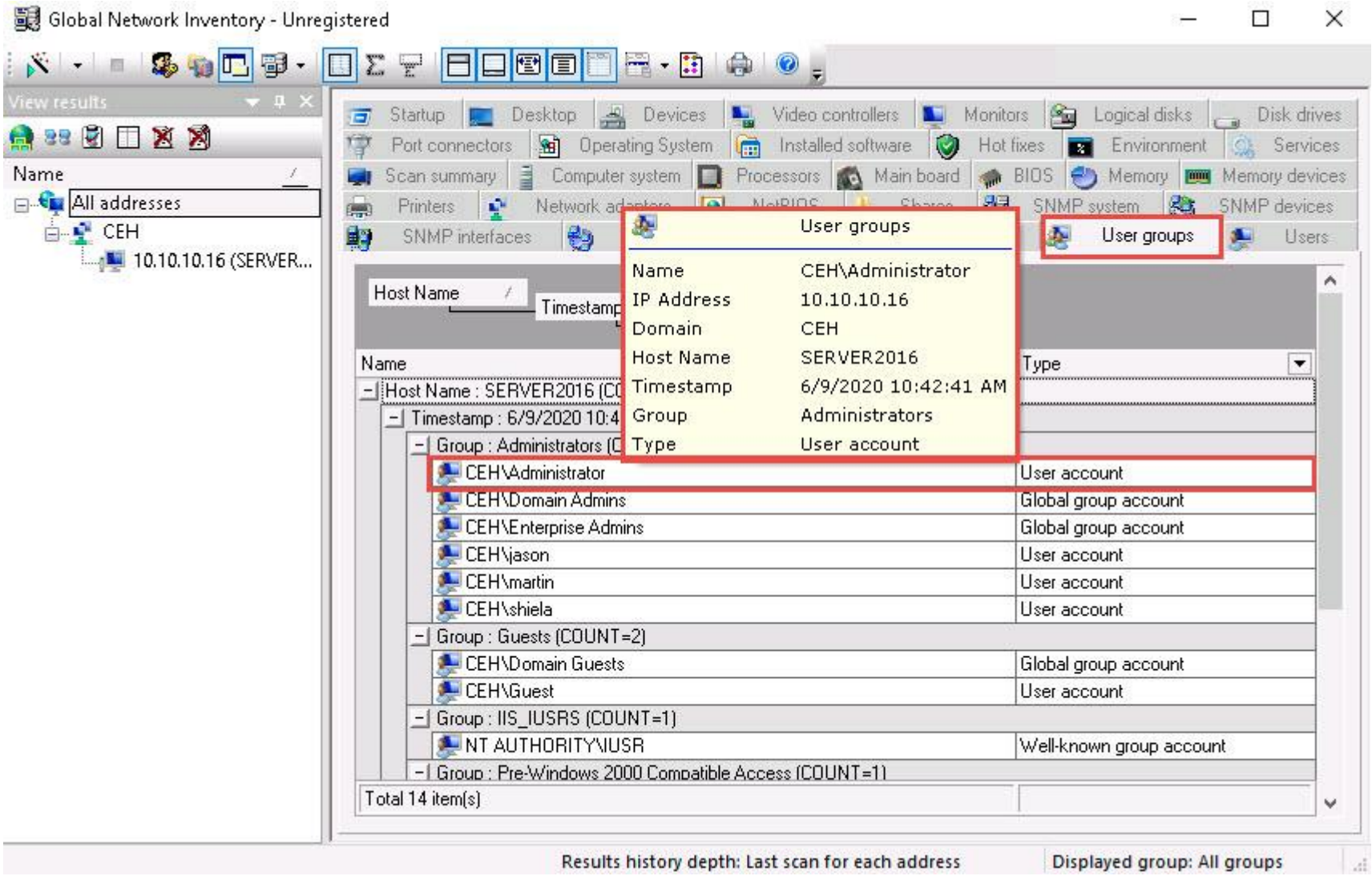
16. Click the **NetBIOS** tab, and hover the mouse cursor over any NetBIOS application to display the detailed NetBIOS information about the target.

Hover the mouse cursor over each NetBIOS application to view its details.

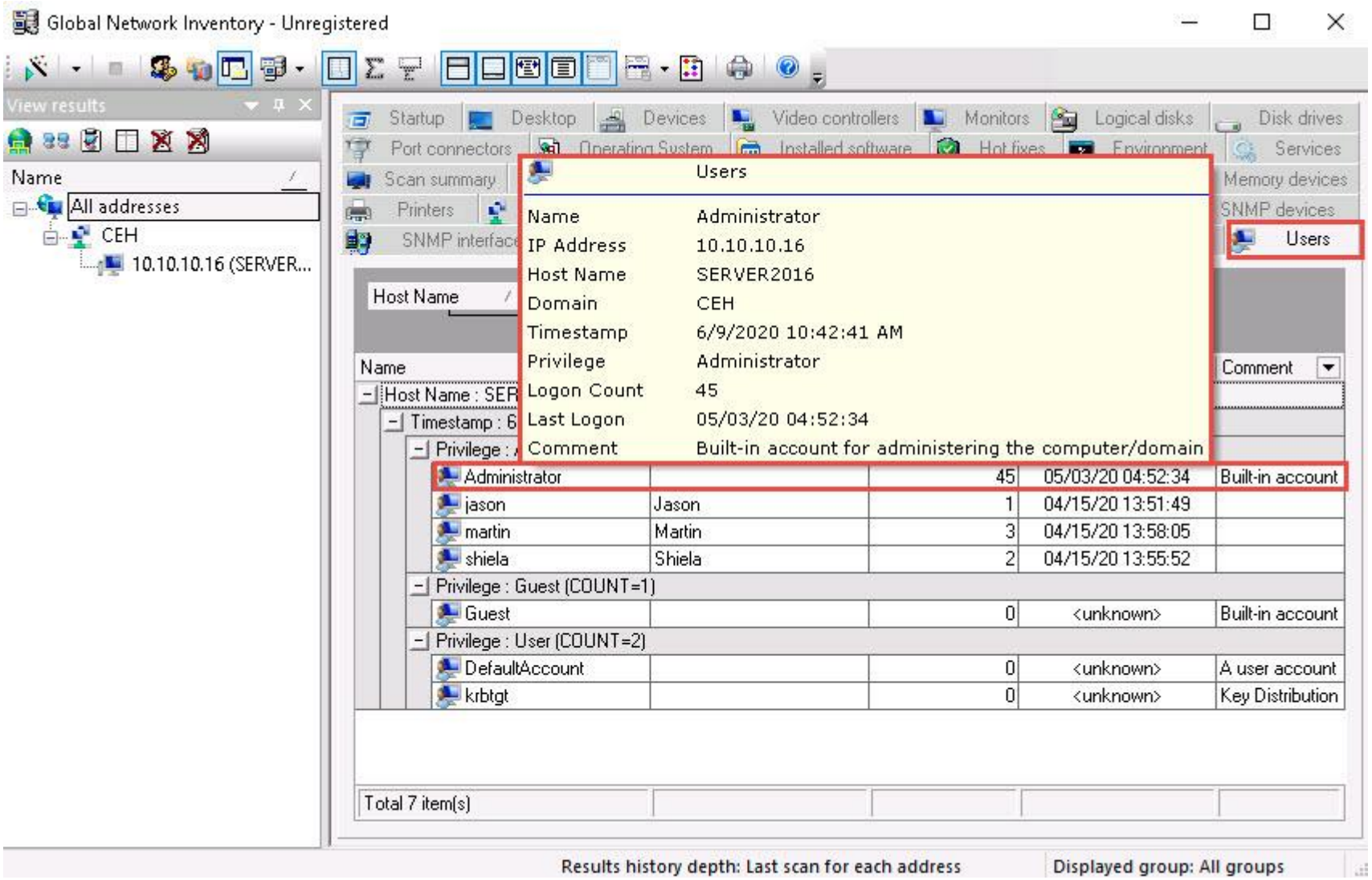


17. ☐ Click the **User groups** tab and hover the mouse cursor over any username to display detailed user groups information.

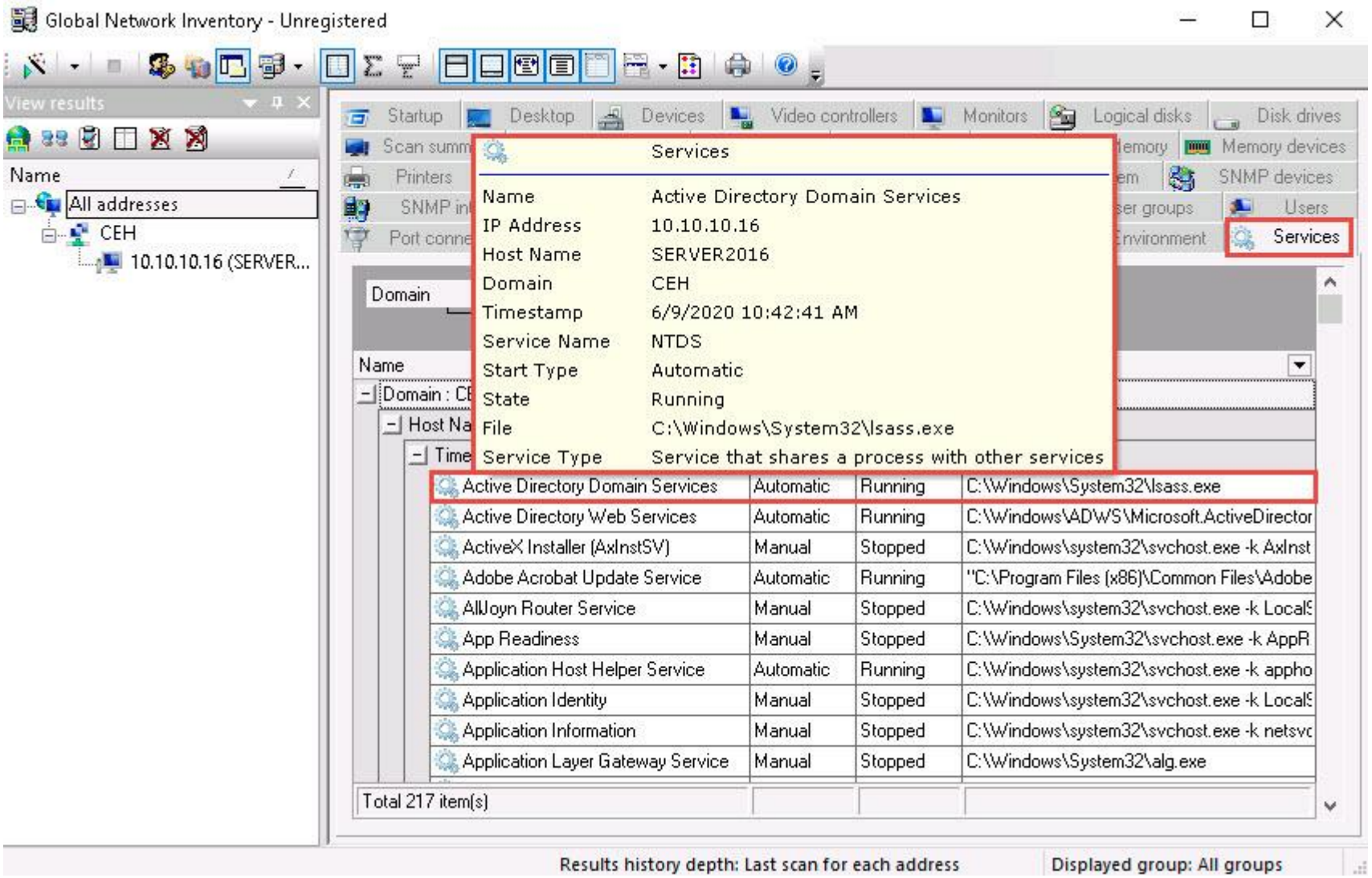
Hover the mouse cursor over each username to view its details.



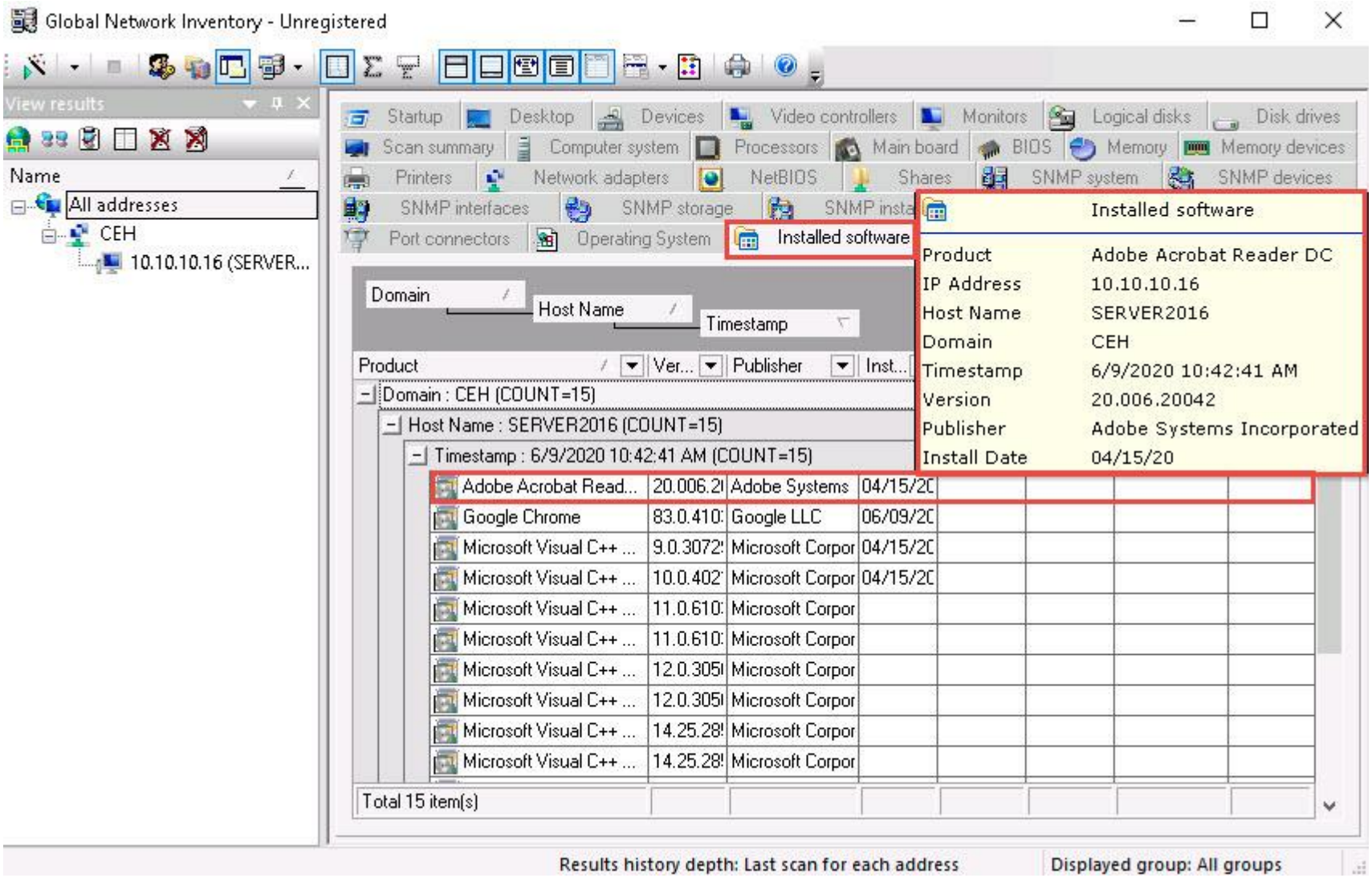
18. ☐ Click the **Users** tab, and hover the mouse cursor over the username to view login details for the target machine.



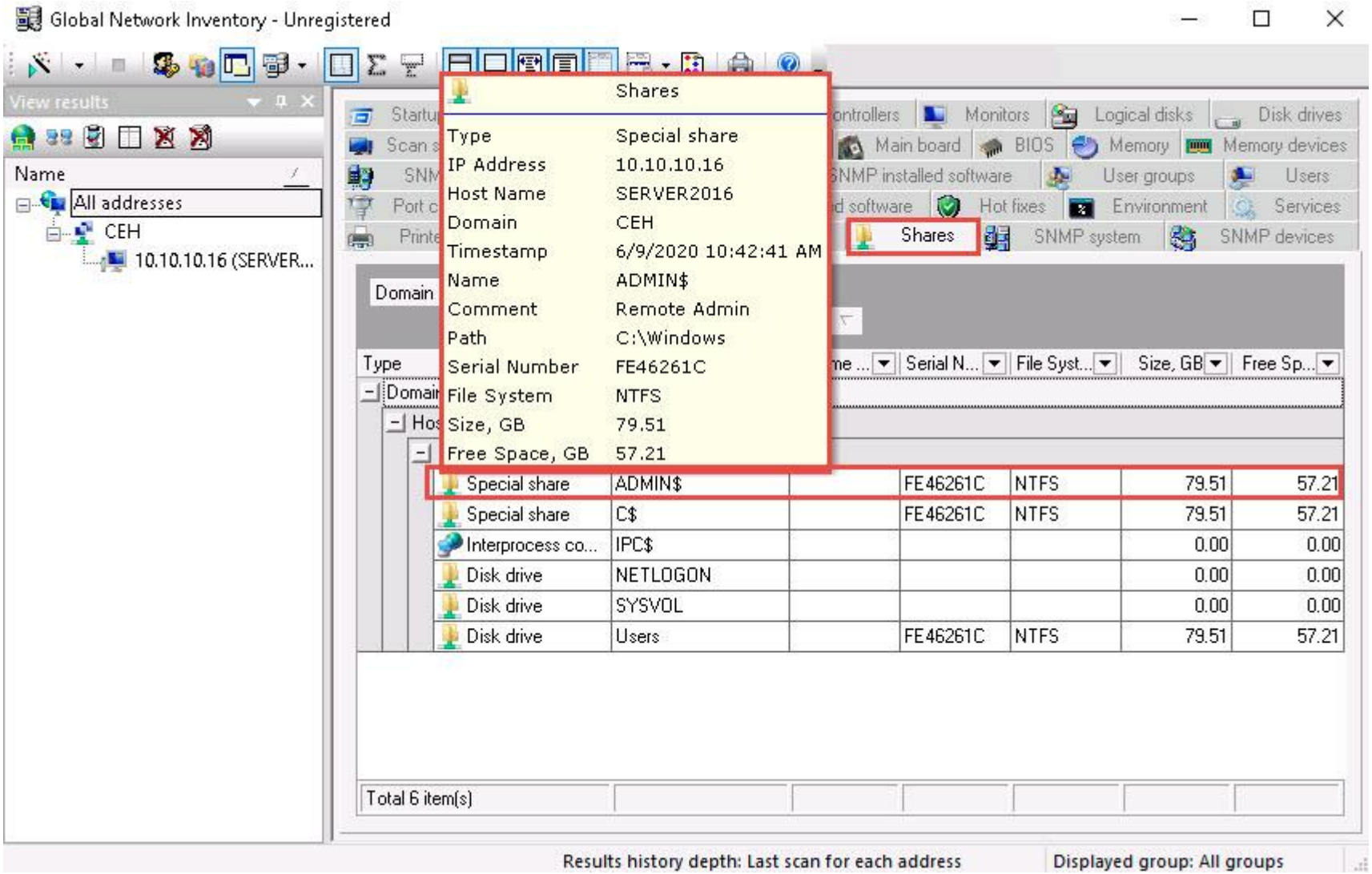
19. ☐ Click the **Services** tab and hover the mouse cursor over any service to view its details.



20. ☐ Click the **Installed software** tab, and hover the mouse cursor over any software to view its details.



21. ☐ Click the **Shares** tab, and hover the mouse cursor over any shared folder to view its details.



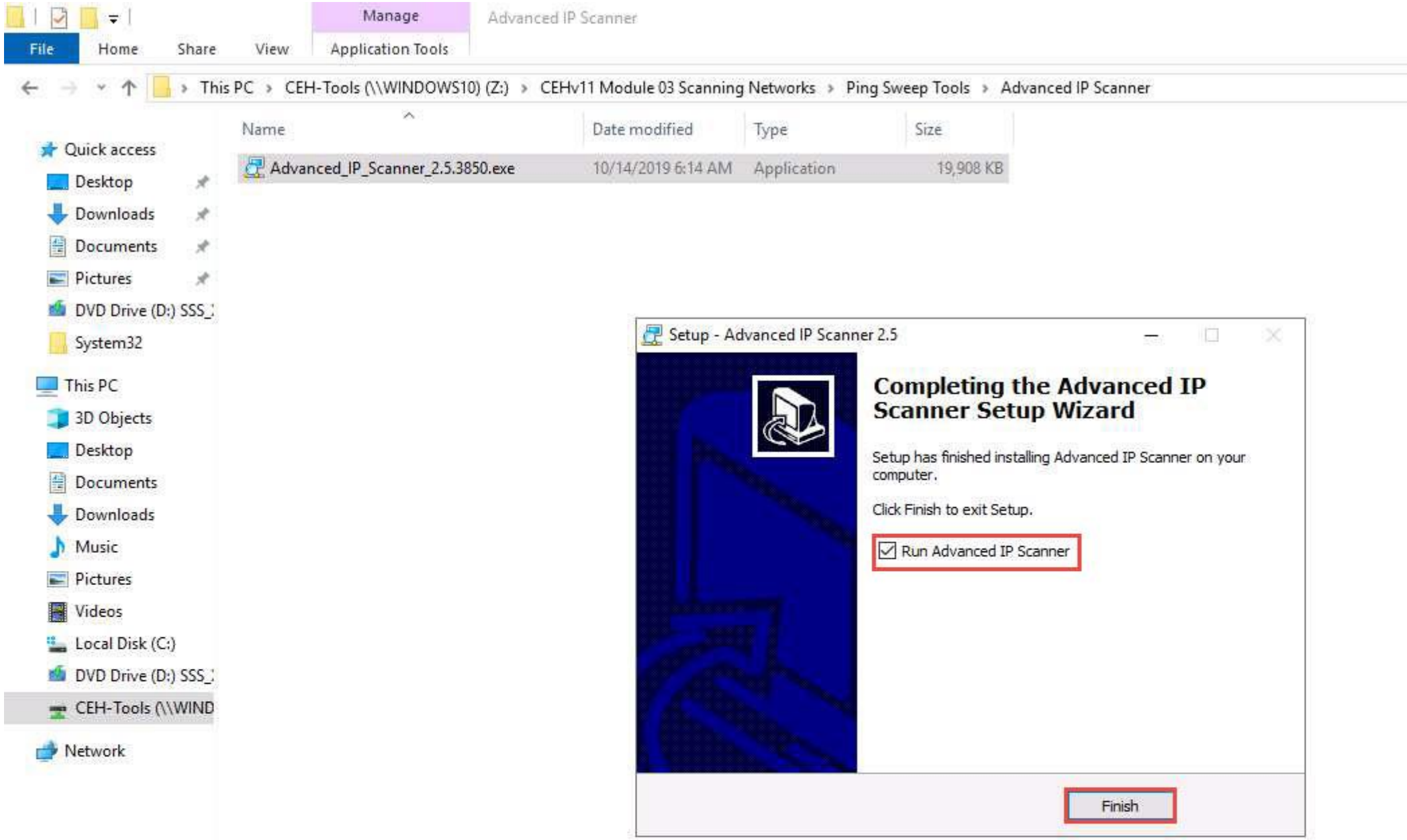
22. ☐ Similarly, you can click other tabs such as **Computer System**, **Processors**, **Main board**, **Memory**, **SNMP systems**, **Main board**, and **Hot fixes**. Hover the mouse cursor over elements under each tab to view their detailed information.
23. ☐ This concludes the demonstration of performing enumeration using the Global Network Inventory.
24. ☐ Close all open windows and document all the acquired information.

Task 2: Enumerate Network Resources using Advanced IP Scanner

Advanced IP Scanner provides various types of information about the computers on a target network. The program shows all network devices, gives you access to shared folders, provides remote control of computers (via RDP and Radmin), and can even remotely switch computers off.

Here, we will use the Advanced IP Scanner to enumerate the network resources of the target network.

1. Click Windows Server 2019 to switch to the **Windows Server 2019** machine.
2. Navigate to **Z:\CEHv11 Module 03 Scanning Networks\Ping Sweep Tools\Advanced IP Scanner** and double-click **Advanced_IP_Scanner_2.5.3850.exe**.
3. Follow the installation steps to install Advanced IP Scanner, using all the default settings.
4. After the installation completes, ensure that the **Run Advanced IP Scanner** option is selected and click **Finish**.


Manage
Advanced IP Scanner
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Application Tools
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Advanced_IP_Scanner_2.5.3850.exe
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DVD Drive (D:) SSS_
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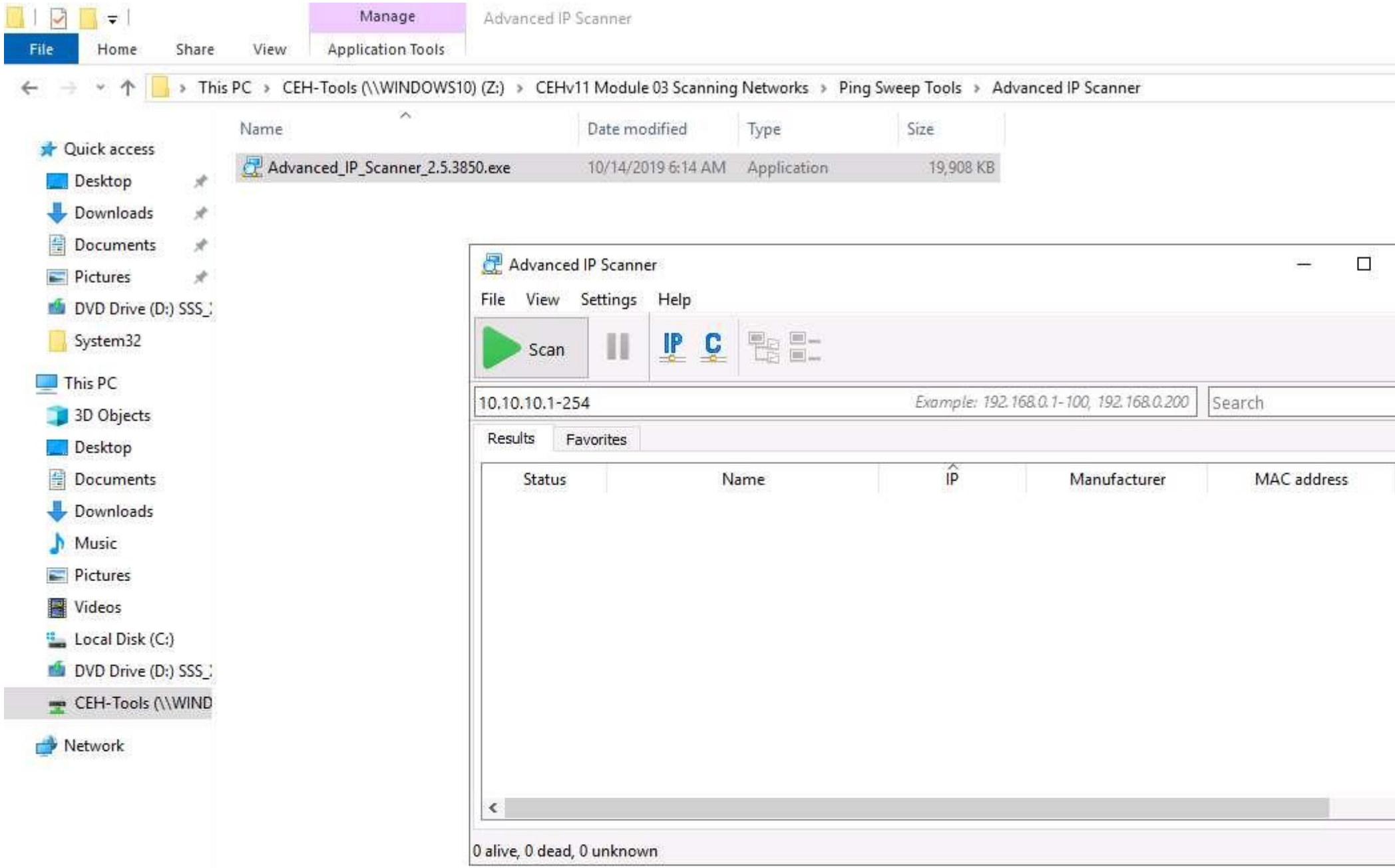
Network
Setup - Advanced IP Scanner 2.5
Completing the Advanced IP Scanner Setup Wizard
Setup has finished installing Advanced IP Scanner on your computer.
Click Finish to exit Setup.
Run Advanced IP Scanner
Finish

5. The **Advanced IP Scanner** GUI appears, as shown in the screenshot.


Manage
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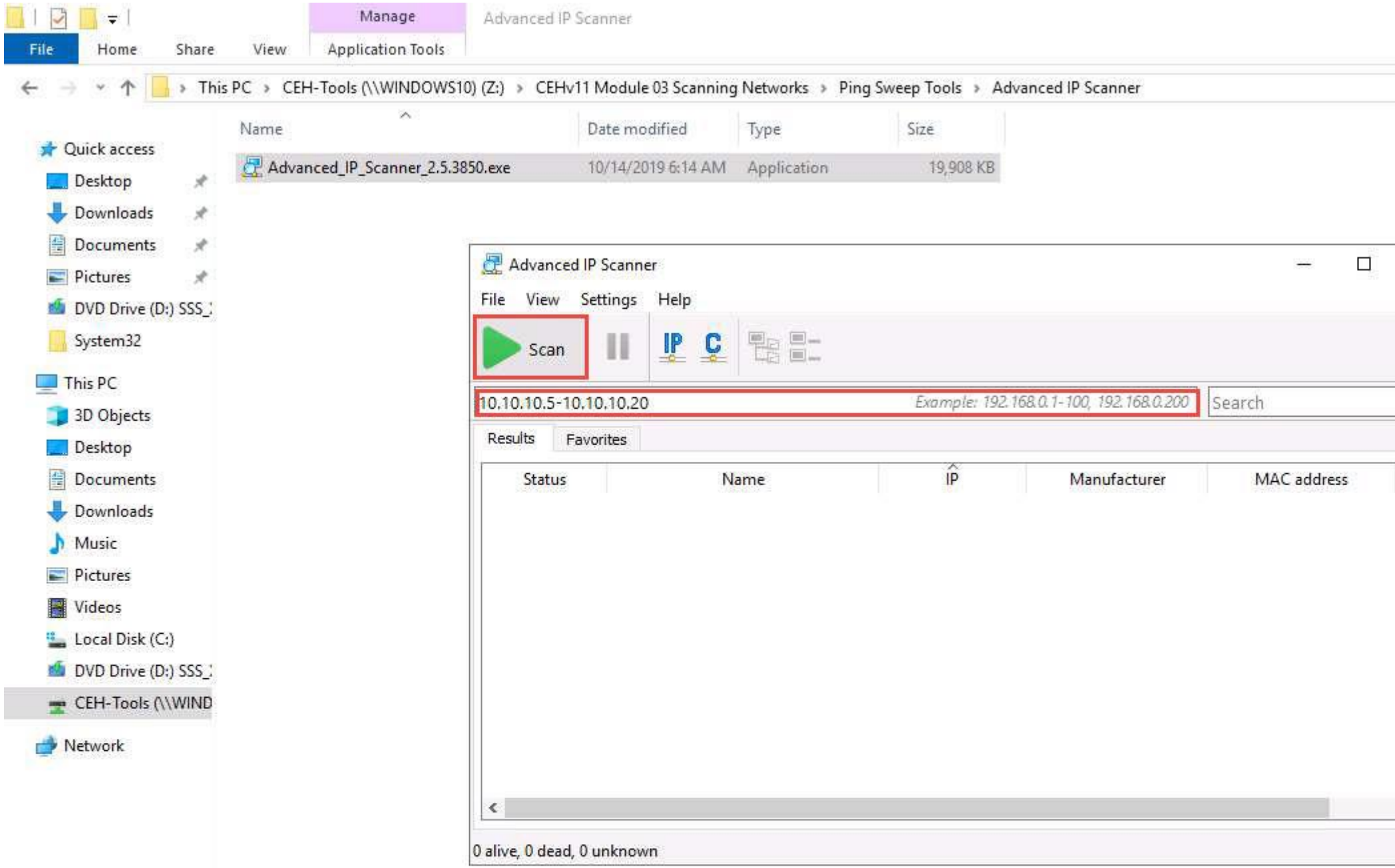
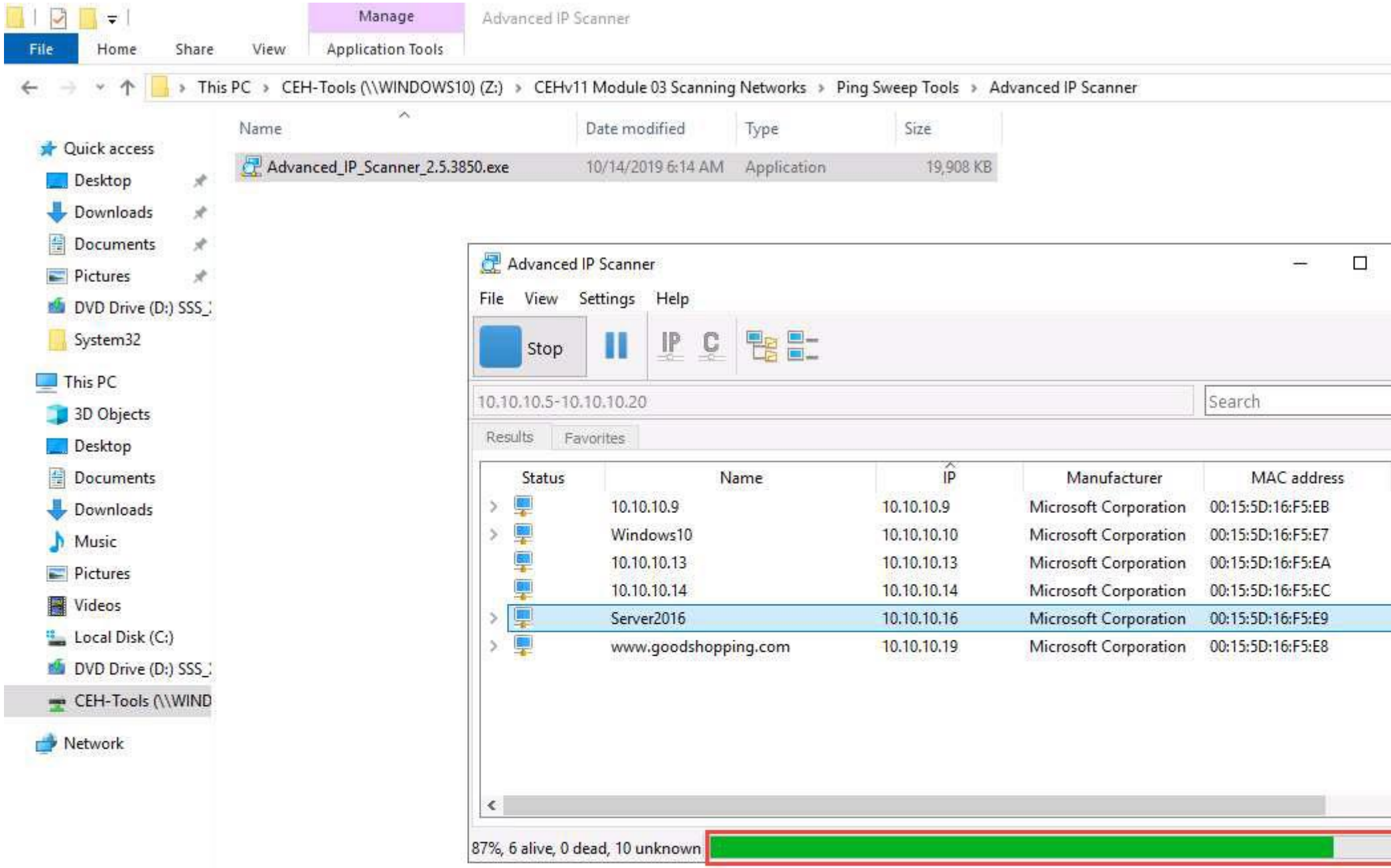
View
Settings
Help
Scan
10.10.10.1-254
Example: 192.168.0.1-100, 192.168.0.200
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
0 alive, 0 dead, 0 unknown

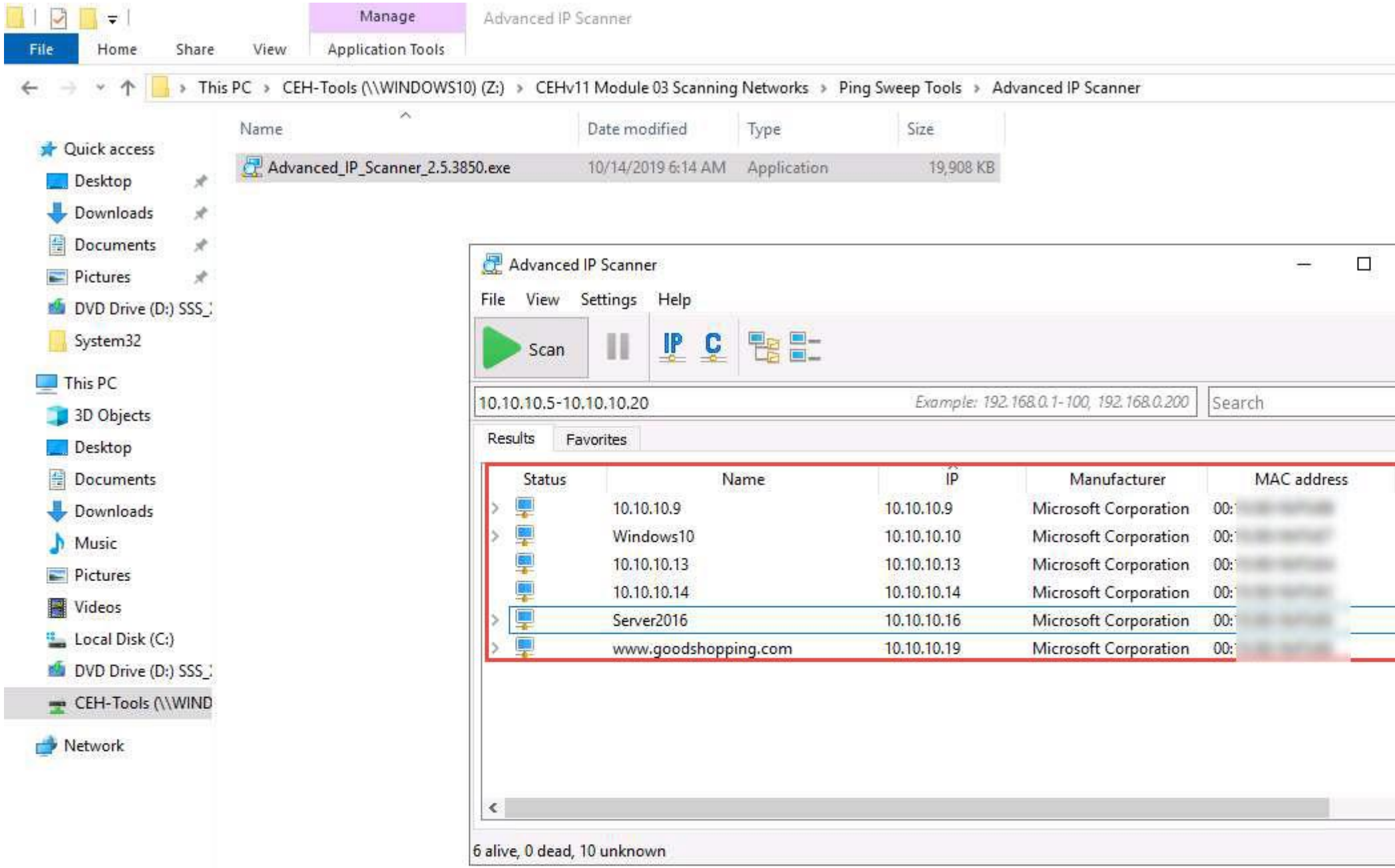
6. In the **IP address range** field, specify the IP range (in this example, we will target **10.10.10.5-10.10.10.20**). Click the **Scan** button.


Manage
Advanced IP Scanner
File
Home
Share
View
Application Tools
This PC › CEH-Tools (\\WINDOWS10) (Z:) › CEHv11 Module 03 Scanning Networks › Ping Sweep Tools › Advanced IP Scanner
Name
Date modified
Type
Size
Advanced_IP_Scanner_2.5.3850.exe
10/14/2019 6:14 AM
Application
19,908 KB
Quick access
Desktop
Downloads
Documents
Pictures
DVD Drive (D:) SSS_
System32
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
CEH-Tools (\\WIND
Network
Advanced IP Scanner
File
View
Settings
Help
Scan
10.10.10.5-10.10.10.20
Example: 192.168.0.1-100, 192.168.0.200
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
0 alive, 0 dead, 0 unknown

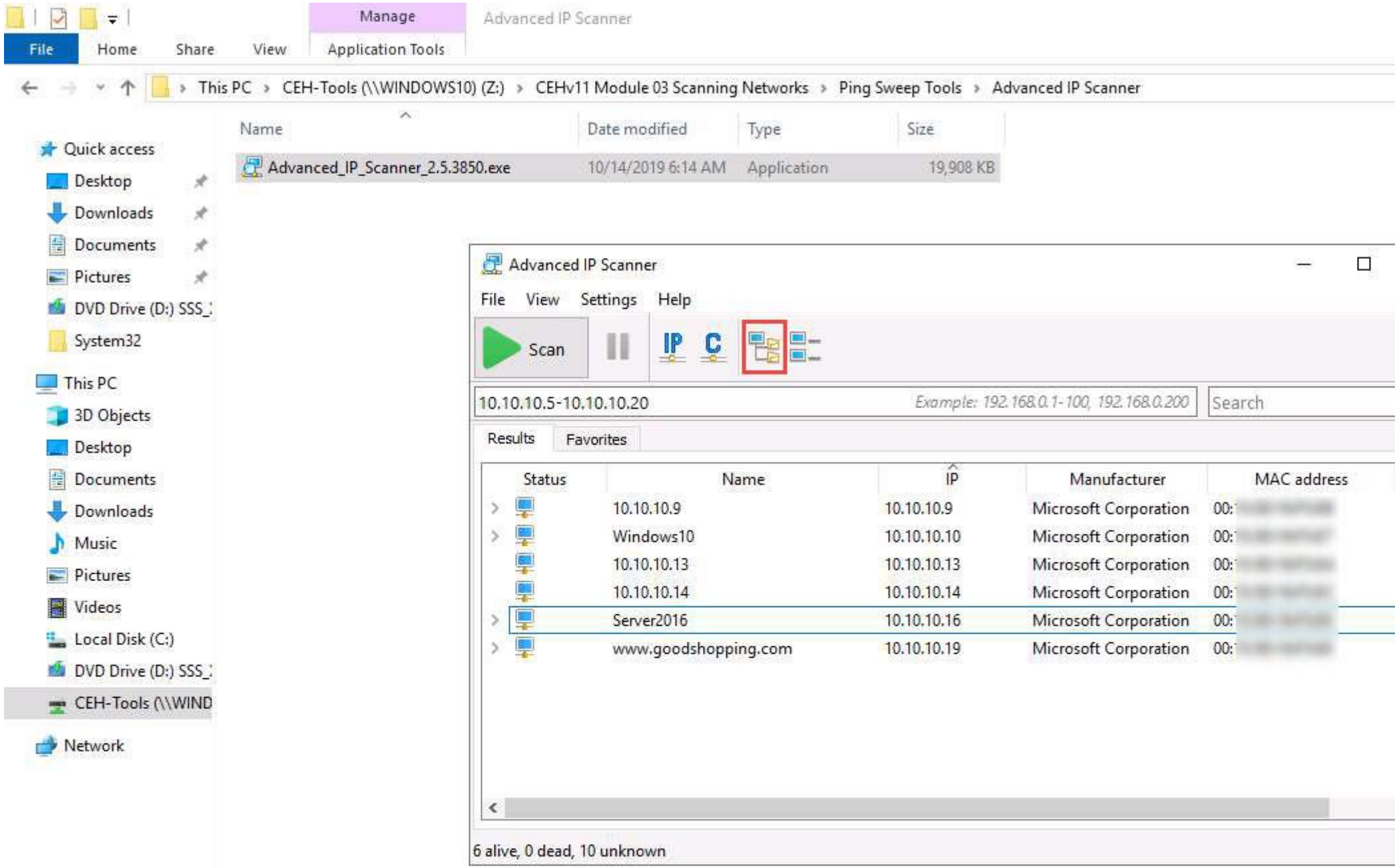
7. **Advanced IP Scanner** scans the target IP address range, with progress tracked by the status bar at the bottom of the window. Wait for the scan to complete.


Manage
Advanced IP Scanner
File
Home
Share
View
Application Tools
This PC › CEH-Tools (\\WINDOWS10) (Z:) › CEHv11 Module 03 Scanning Networks › Ping Sweep Tools › Advanced IP Scanner
Name
Date modified
Type
Size
Advanced_IP_Scanner_2.5.3850.exe
10/14/2019 6:14 AM
Application
19,908 KB
Quick access
Desktop
Downloads
Documents
Pictures
DVD Drive (D:) SSS_
System32
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
CEH-Tools (\\WIND
Network
Advanced IP Scanner
File
View
Settings
Help
Stop
10.10.10.5-10.10.10.20
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
10.10.10.9
10.10.10.9
Microsoft Corporation
00:15:5D:16:F5:EB
Windows10
10.10.10.10
Microsoft Corporation
00:15:5D:16:F5:E7
10.10.10.13
10.10.10.13
Microsoft Corporation
00:15:5D:16:F5:EA
10.10.10.14
10.10.10.14
Microsoft Corporation
00:15:5D:16:F5:EC
Server2016
10.10.10.16
Microsoft Corporation
00:15:5D:16:F5:E9
www.goodshopping.com
10.10.10.19
Microsoft Corporation
00:15:5D:16:F5:E8
87%, 6 alive, 0 dead, 10 unknown

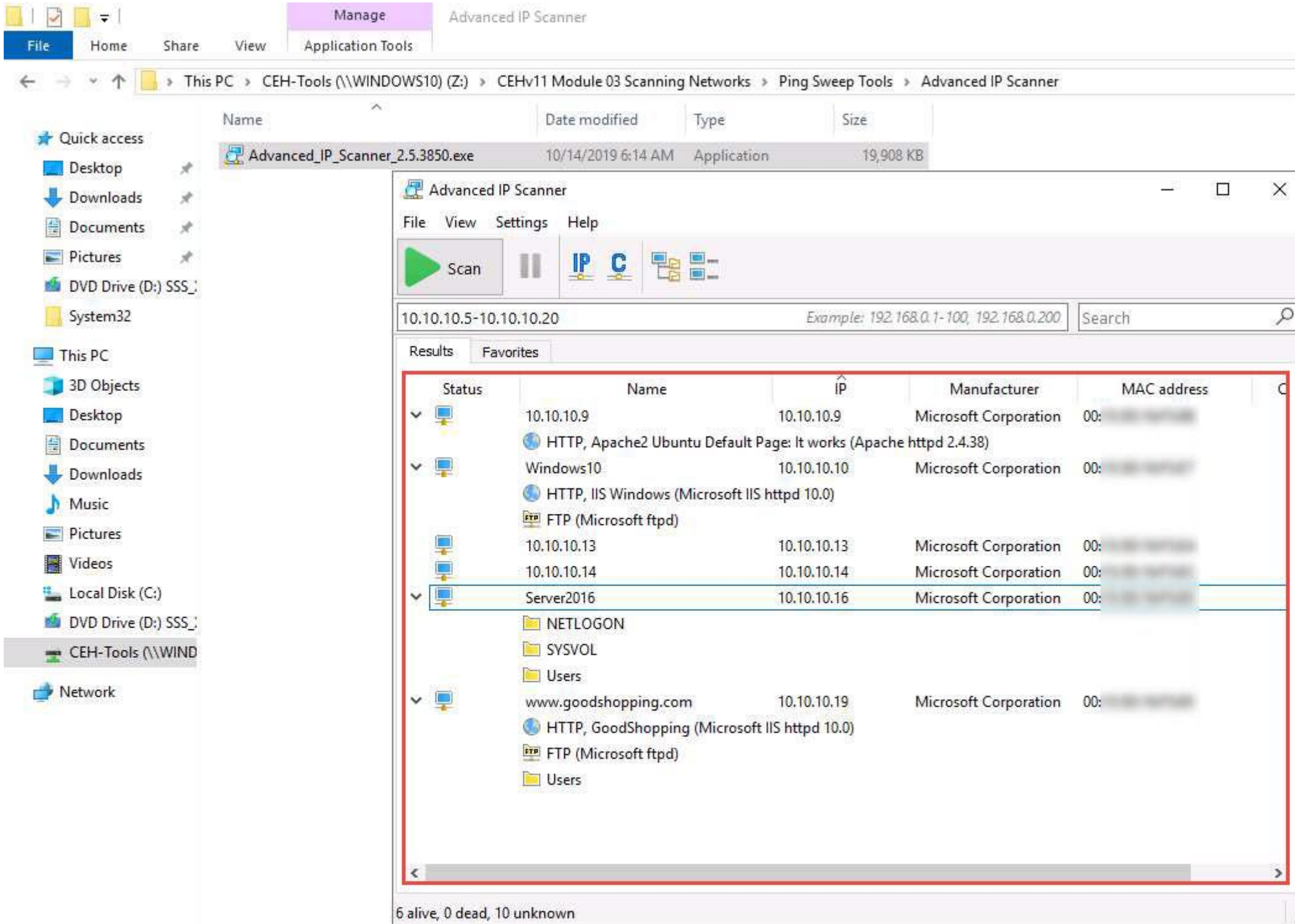
8. The scan results appear, displaying information about active hosts in the target network such as status, machine name, IP address, manufacturer name, and MAC addresses, as shown in the screenshot.


Manage
Advanced IP Scanner
File
Home
Share
View
Application Tools
This PC › CEH-Tools (\\WINDOWS10) (Z:) › CEHv11 Module 03 Scanning Networks › Ping Sweep Tools › Advanced IP Scanner
Name
Date modified
Type
Size
Advanced_IP_Scanner_2.5.3850.exe
10/14/2019 6:14 AM
Application
19,908 KB
Quick access
Desktop
Downloads
Documents
Pictures
DVD Drive (D:) SSS_
System32
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
CEH-Tools (\\WIND
Network
Advanced IP Scanner
File
View
Settings
Help
Scan
10.10.10.5-10.10.10.20
Example: 192.168.0.1-100, 192.168.0.200
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
10.10.10.9
10.10.10.9
Microsoft Corporation
Windows10
10.10.10.10
Microsoft Corporation
10.10.10.13
10.10.10.13
Microsoft Corporation
10.10.10.14
10.10.10.14
Microsoft Corporation
Server2016
10.10.10.16
Microsoft Corporation
www.goodshopping.com
10.10.10.19
Microsoft Corporation
6 alive, 0 dead, 10 unknown

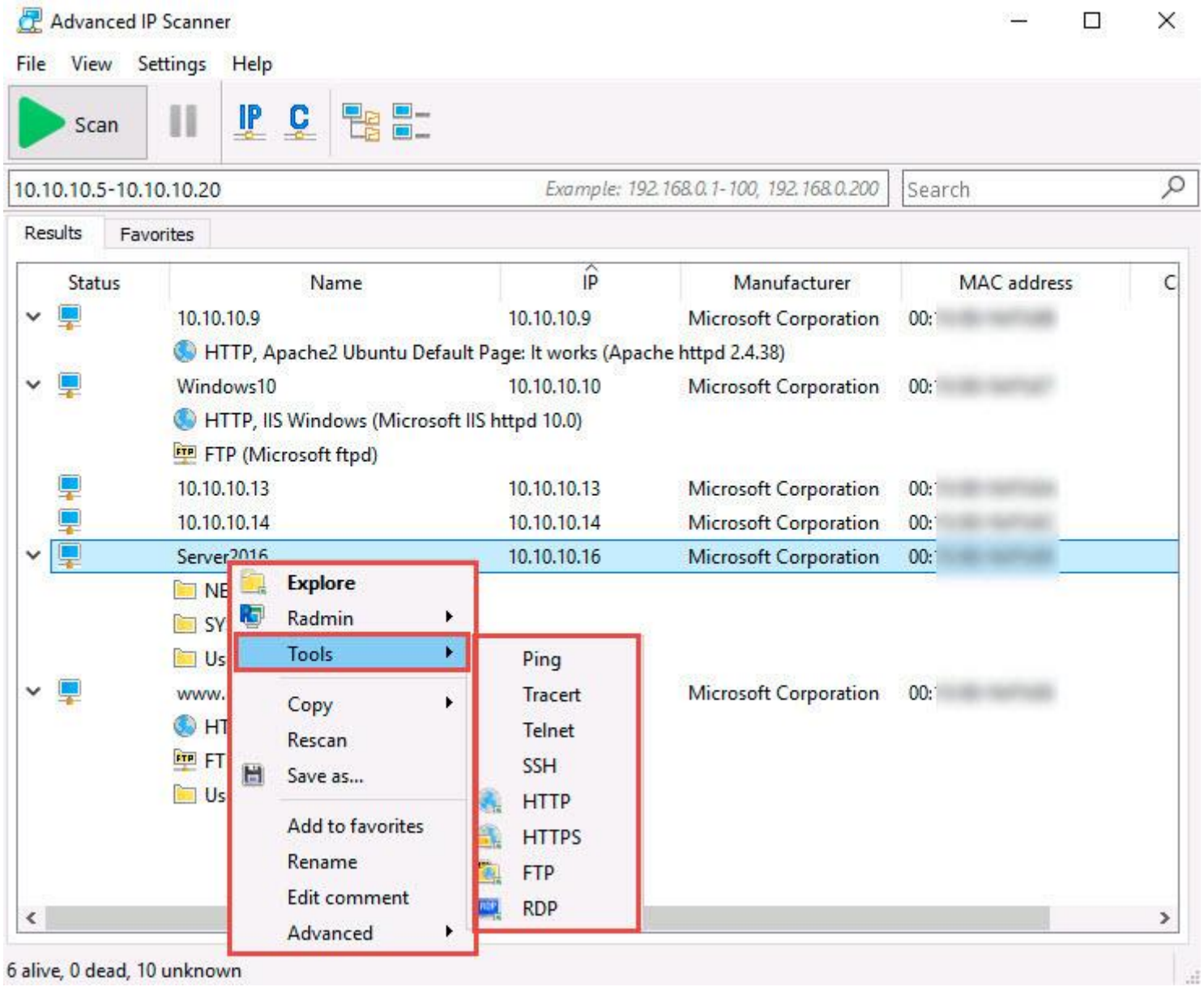
9. Click the **Expand all** icon to view the shared folders and services running on the target network.


Manage
Advanced IP Scanner
File
Home
Share
View
Application Tools
This PC › CEH-Tools (\\WINDOWS10) (Z:) › CEHv11 Module 03 Scanning Networks › Ping Sweep Tools › Advanced IP Scanner
Name
Date modified
Type
Size
Advanced_IP_Scanner_2.5.3850.exe
10/14/2019 6:14 AM
Application
19,908 KB
Quick access
Desktop
Downloads
Documents
Pictures
DVD Drive (D:) SSS_
System32
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
CEH-Tools (\\WIND
Network
Advanced IP Scanner
File
View
Settings
Help
Scan
10.10.10.5-10.10.10.20
Example: 192.168.0.1-100, 192.168.0.200
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
10.10.10.9
10.10.10.9
Microsoft Corporation
Windows10
10.10.10.10
Microsoft Corporation
10.10.10.13
10.10.10.13
Microsoft Corporation
10.10.10.14
10.10.10.14
Microsoft Corporation
Server2016
10.10.10.16
Microsoft Corporation
www.goodshopping.com
10.10.10.19
Microsoft Corporation
6 alive, 0 dead, 10 unknown

10. ☐ The shared folders and services running on the target network appear, as shown in the screenshot.


Manage
Advanced IP Scanner
File
Home
Share
View
Application Tools
This PC › CEH-Tools (\\WINDOWS10) (Z:) › CEHv11 Module 03 Scanning Networks › Ping Sweep Tools › Advanced IP Scanner
Name
Date modified
Type
Size
Advanced_IP_Scanner_2.5.3850.exe
10/14/2019 6:14 AM
Application
19,908 KB
Quick access
Desktop
Downloads
Documents
Pictures
DVD Drive (D:) SSS_
System32
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
CEH-Tools (\\WIND
Network
Advanced IP Scanner
File
View
Settings
Help
Scan
10.10.10.5-10.10.10.20
Example: 192.168.0.1-100, 192.168.0.200
Search
Results
Favorites
Status
Name
IP
Manufacturer
MAC address
10.10.10.9
10.10.10.9
Microsoft Corporation
HTTP, Apache2 Ubuntu Default Page: It works (Apache httpd 2.4.38)
Windows10
10.10.10.10
Microsoft Corporation
HTTP, IIS Windows (Microsoft IIS httpd 10.0)
FTP (Microsoft ftpd)
10.10.10.13
10.10.10.13
Microsoft Corporation
10.10.10.14
10.10.10.14
Microsoft Corporation
Server2016
10.10.10.16
Microsoft Corporation
NETLOGON
SYSVOL
Users
www.goodshopping.com
10.10.10.19
Microsoft Corporation
HTTP, GoodShopping (Microsoft IIS httpd 10.0)
FTP (Microsoft ftpd)
Users
6 alive, 0 dead, 10 unknown

11. ☐ Right-click any of the detected IP addresses to list available options.



12. Using these options, you can ping, traceroute, transfer files, chat, send a message, connect to the target machine remotely (using **Radmin**), etc.

    To use the Radmin option, you need to install Radmin viewer, which you can download at **http://www.radmin.com**.

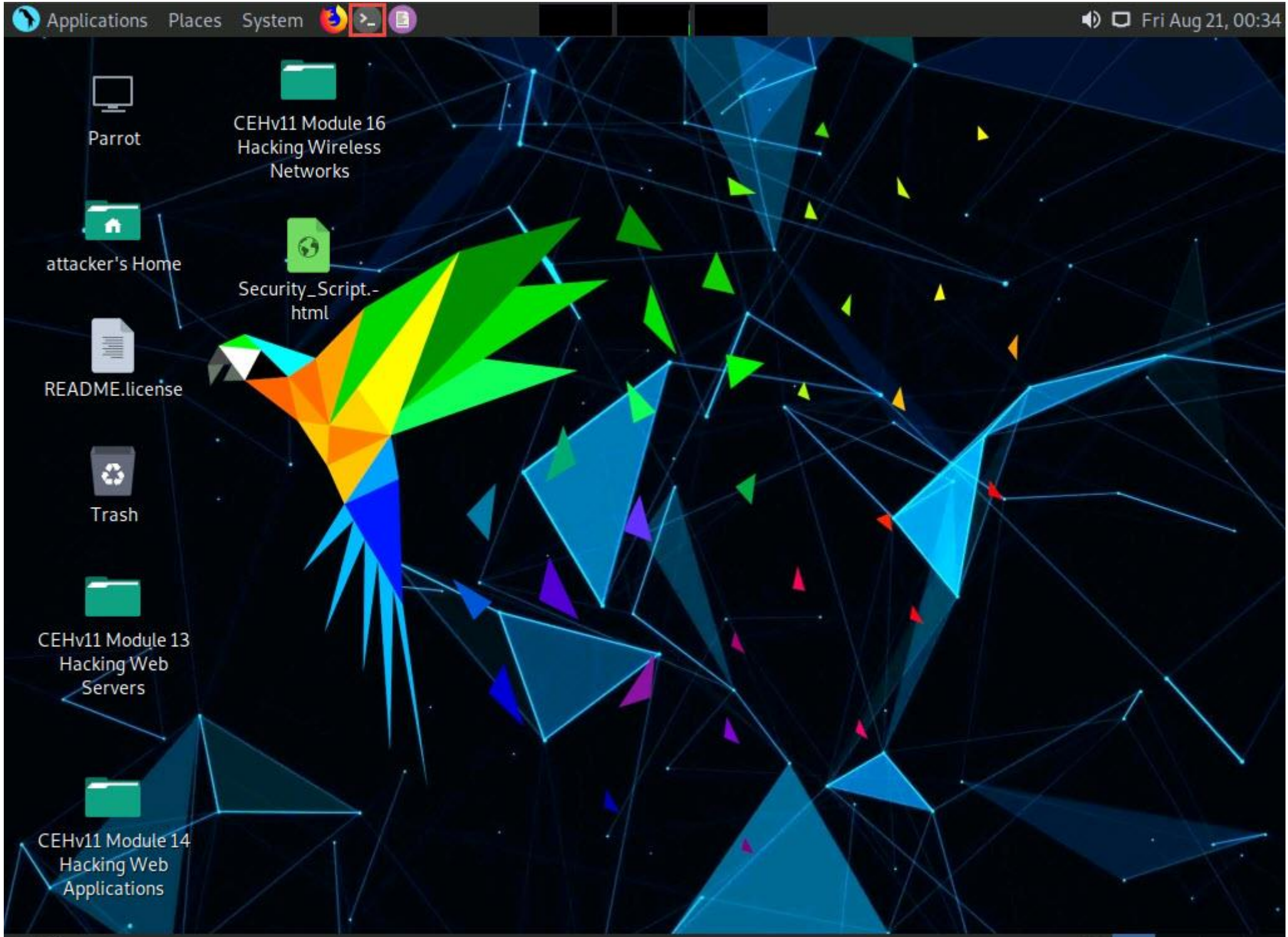
13. In the same way, you can select various other options to retrieve shared files, view system-related information, etc.
14. This concludes the demonstration of enumerating network resources using Advanced IP Scanner.
15. Close all open windows and document all the acquired information.

Task 3: Enumerate Information from Windows and Samba Hosts using Enum4linux

Enum4linux is a tool for enumerating information from Windows and Samba systems. It is used for share enumeration, password policy retrieval, identification of remote OSes, detecting if hosts are in a workgroup or a domain, user listing on hosts, listing group membership information, etc.

Here, we will use the Enum4Linux to perform enumeration on a Windows and a Samba host.

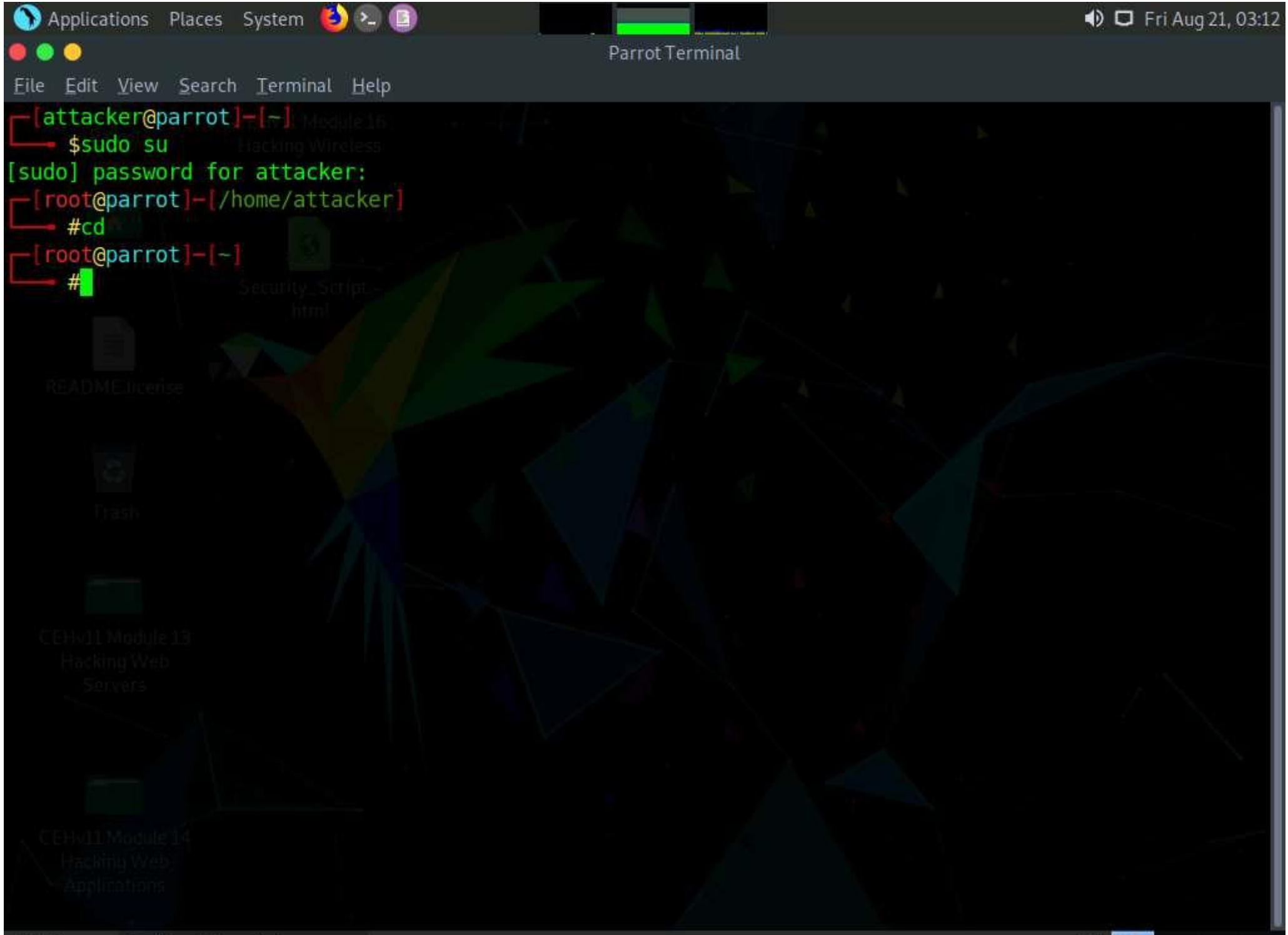
1. Click Parrot Security to switch to the **Parrot Security** machine.
2. Click the **MATE Terminal** icon at the top of the **Desktop** window to open a **Terminal** window.


Applications
Places
System
Fri Aug 21, 00:34
Parrot
CEHv11 Module 16 Hacking Wireless Networks
attacker's Home
Security_Script.-html
README.license
Trash
CEHv11 Module 13 Hacking Web Servers
CEHv11 Module 14 Hacking Web Applications

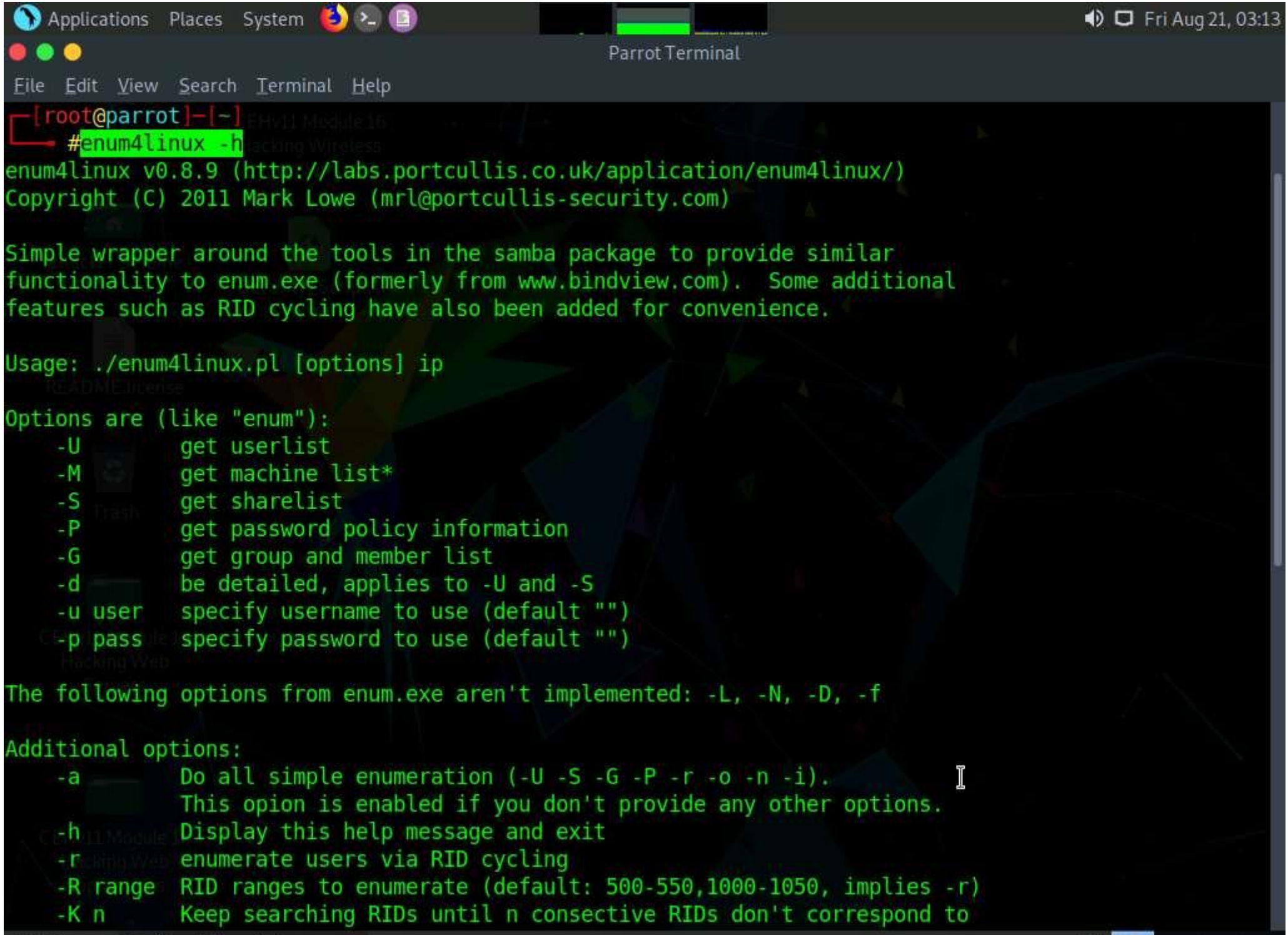
3. A **Parrot Terminal** window appears. In the terminal window, type **sudo su** and press **Enter** to run the programs as a root user.
4. In the **[sudo] password for attacker** field, type **toor** as a password and press **Enter**.

   The password that you type will not be visible.

5. Now, type **cd** and press **Enter** to jump to the root directory.

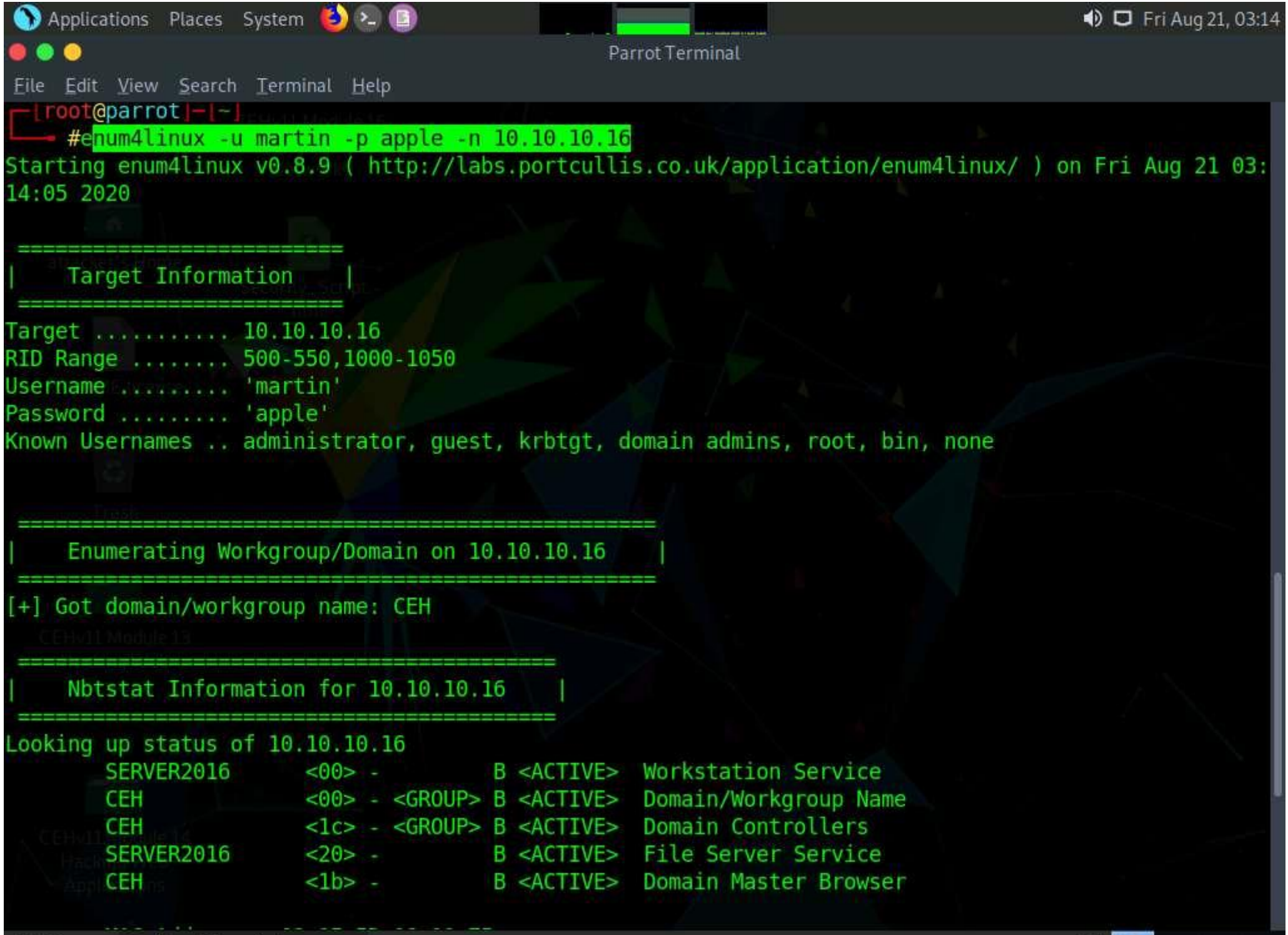

Applications
Places
System
Fri Aug 21, 03:12
Parrot Terminal
File Edit View Search Terminal Help
[attacker@parrot]-[~]
$sudo su
[sudo] password for attacker:
[root@parrot]-[/home/attacker]
#cd
[root@parrot]-[~]
#

6. In the **Parrot Terminal** window, type **enum4linux -h** and press **Enter** to view the various options available with enum4linux.
7. The help options appear, as shown in the screenshot. In this lab, we will demonstrate only a few options to conduct enumeration on the target machine.

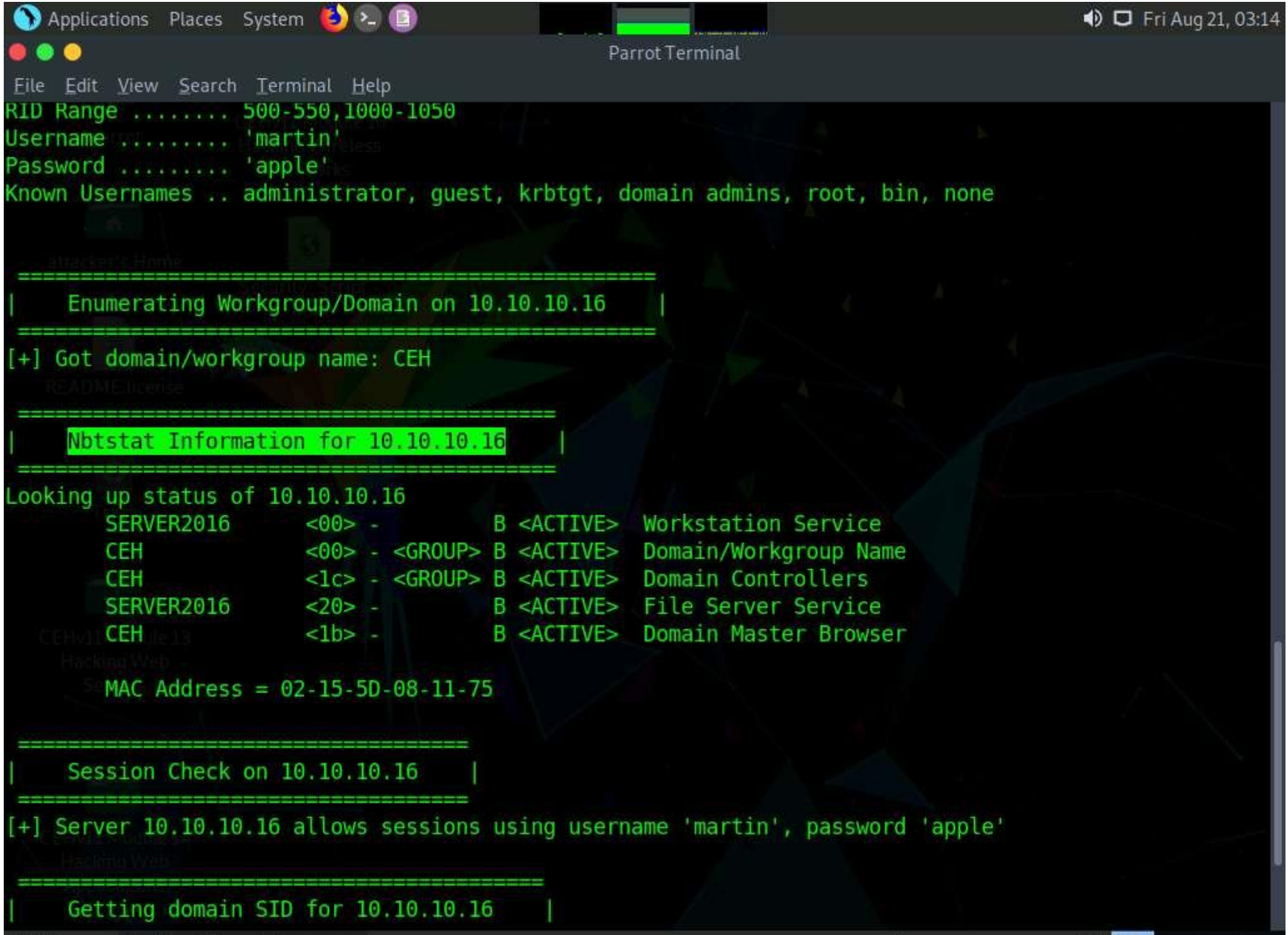

Applications Places System
Fri Aug 21, 03:13
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -h
enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/)
Copyright (C) 2011 Mark Lowe (mrl@portcullis-security.com)
Simple wrapper around the tools in the samba package to provide similar
functionality to enum.exe (formerly from www.bindview.com). Some additional
features such as RID cycling have also been added for convenience.
Usage: ./enum4linux.pl [options] ip
Options are (like "enum"):
-U get userlist
-M get machine list*
-S get sharelist
-P get password policy information
-G get group and member list
-d be detailed, applies to -U and -S
-u user specify username to use (default "")
-p pass specify password to use (default "")
The following options from enum.exe aren't implemented: -L, -N, -D, -f
Additional options:
-a Do all simple enumeration (-U -S -G -P -r -o -n -i).
This opion is enabled if you don't provide any other options.
-h Display this help message and exit
-r enumerate users via RID cycling
-R range RID ranges to enumerate (default: 500-550,1000-1050, implies -r)
-K n Keep searching RIDs until n consective RIDs don't correspond to

8. We will first enumerate the NetBIOS information of the target machine. In the terminal window, type **enum4linux -u martin -p apple -n [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter**.

In this command, **-u user** specifies the username to use and **-p pass** specifies the password.

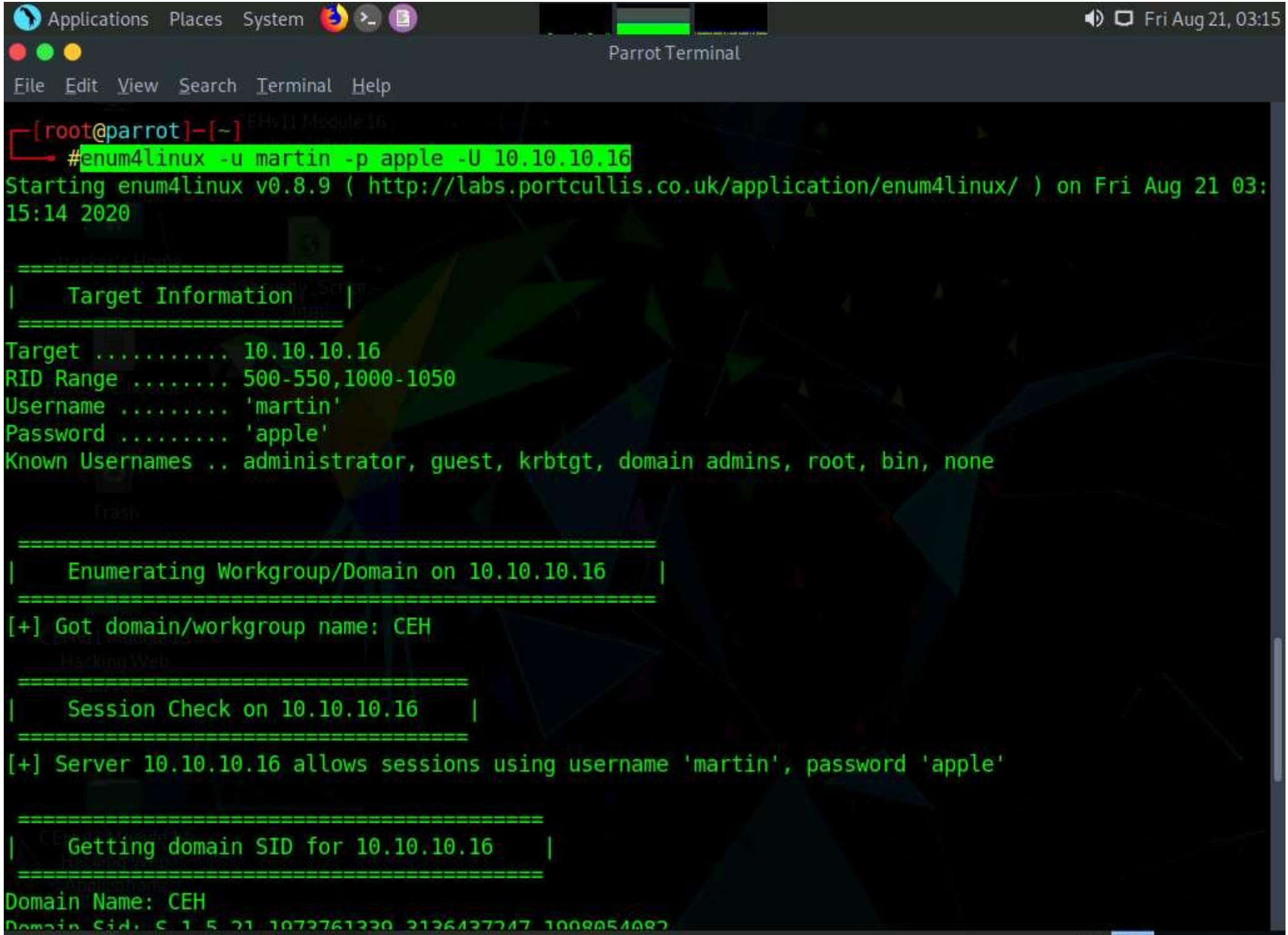

Applications Places System
Fri Aug 21, 03:14
Parrot Terminal
File Edit View Search Terminal Help
root@parrot
#enum4linux -u martin -p apple -n 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:14:05 2020
Target Information
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
Enumerating Workgroup/Domain on 10.10.10.16
[+] Got domain/workgroup name: CEH
Nbtstat Information for 10.10.10.16
Looking up status of 10.10.10.16
SERVER2016 <00> - B <ACTIVE> Workstation Service
CEH <00> - <GROUP> B <ACTIVE> Domain/Workgroup Name
CEH <1c> - <GROUP> B <ACTIVE> Domain Controllers
SERVER2016 <20> - B <ACTIVE> File Server Service
CEH <1b> - B <ACTIVE> Domain Master Browser

9. The tool enumerates the target system and displays the NetBIOS information under the **Nbtstat Information** section, as shown in the screenshot.

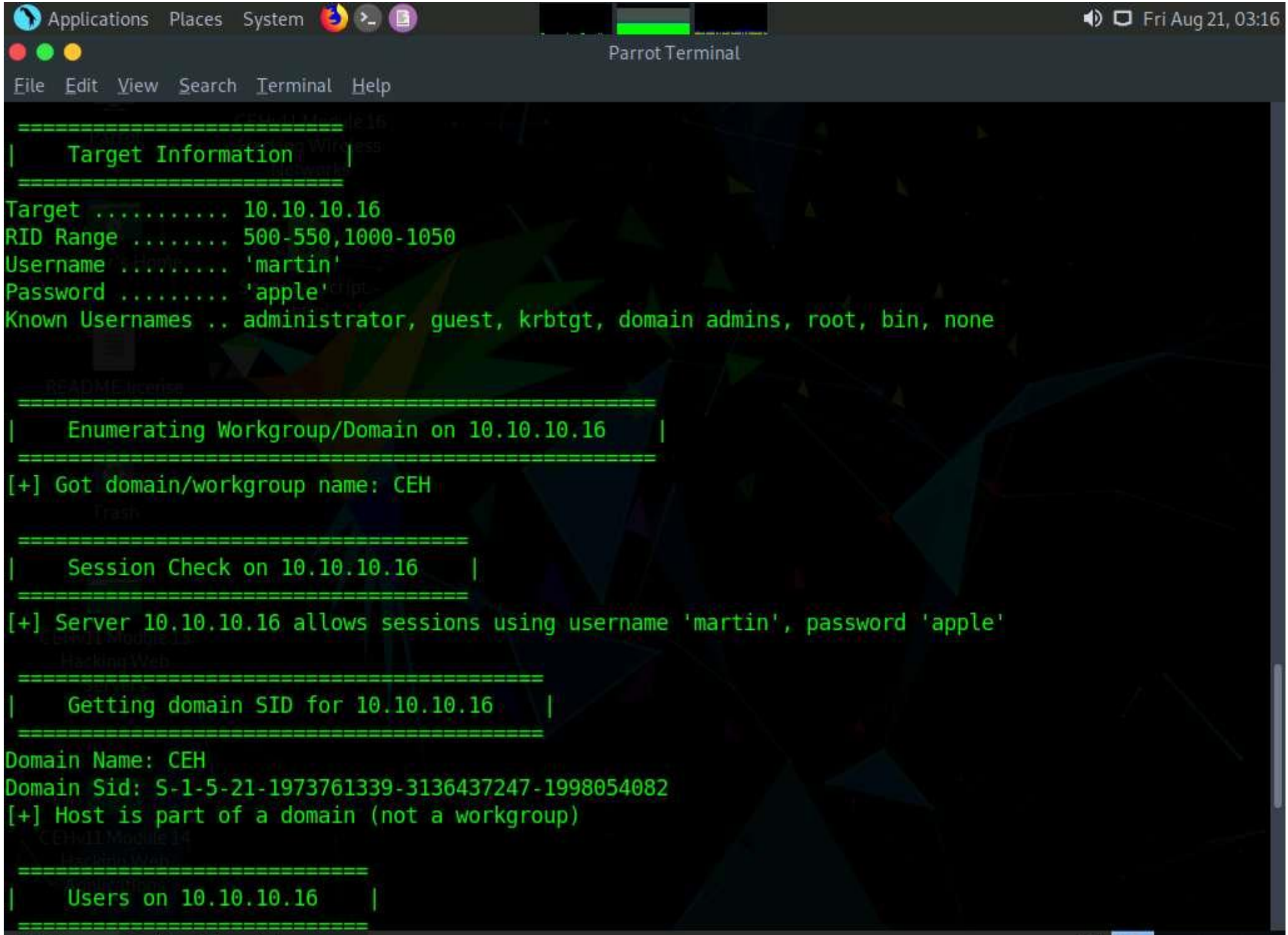

Applications Places System
Fri Aug 21, 03:14
Parrot Terminal
File Edit View Search Terminal Help
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Nbtstat Information for 10.10.10.16 |
Looking up status of 10.10.10.16
SERVER2016 <00> - B <ACTIVE> Workstation Service
CEH <00> - <GROUP> B <ACTIVE> Domain/Workgroup Name
CEH <1c> - <GROUP> B <ACTIVE> Domain Controllers
SERVER2016 <20> - B <ACTIVE> File Server Service
CEH <1b> - B <ACTIVE> Domain Master Browser
MAC Address = 02-15-5D-08-11-75
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |

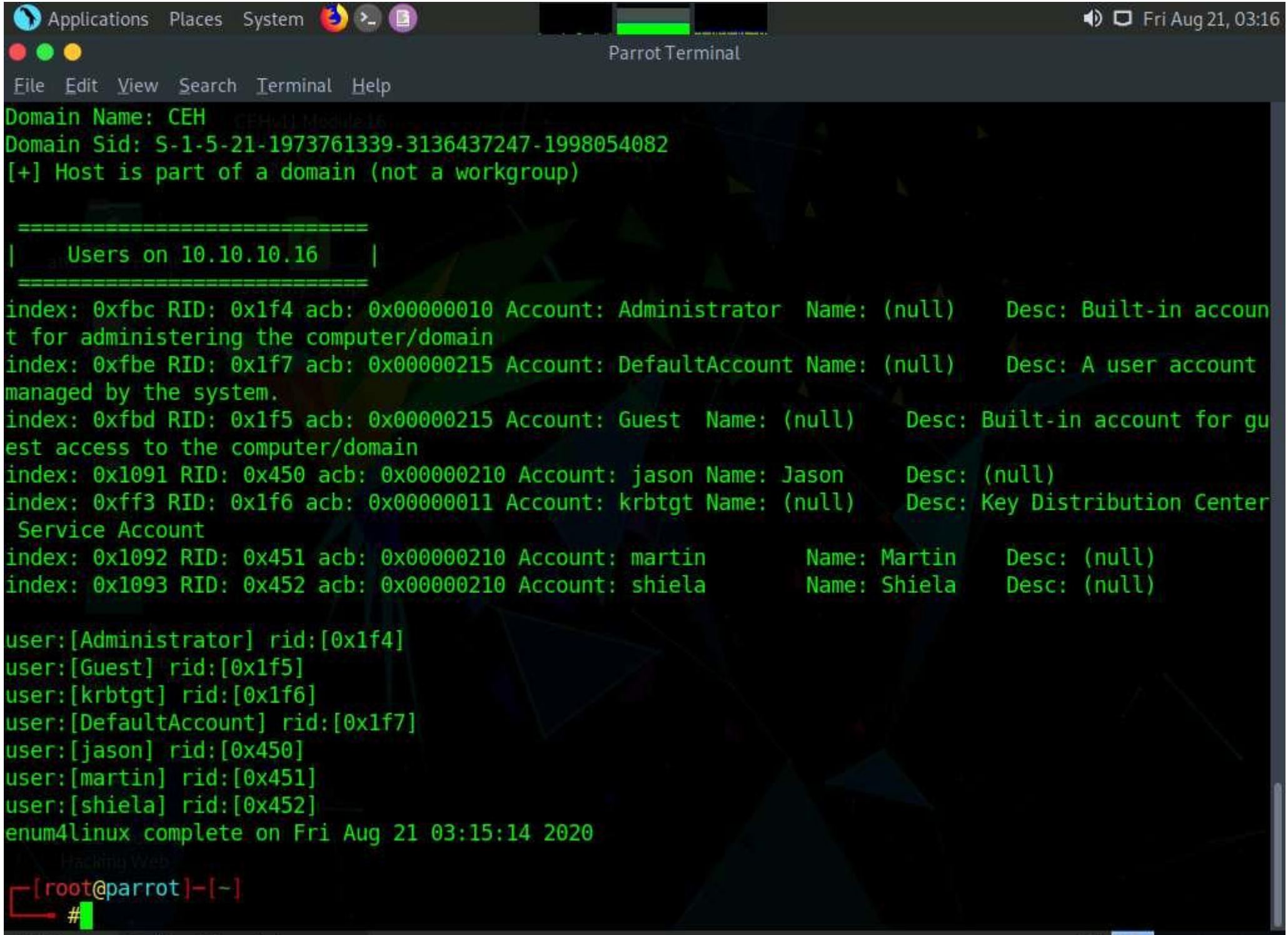
10. In the terminal window, type **enum4linux -u martin -p apple -U [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter** to run the tool with the “get userlist” option.

In this case, **10.10.10.16** is the IP address of the **Windows Server 2016**; this might be different in your lab environment.

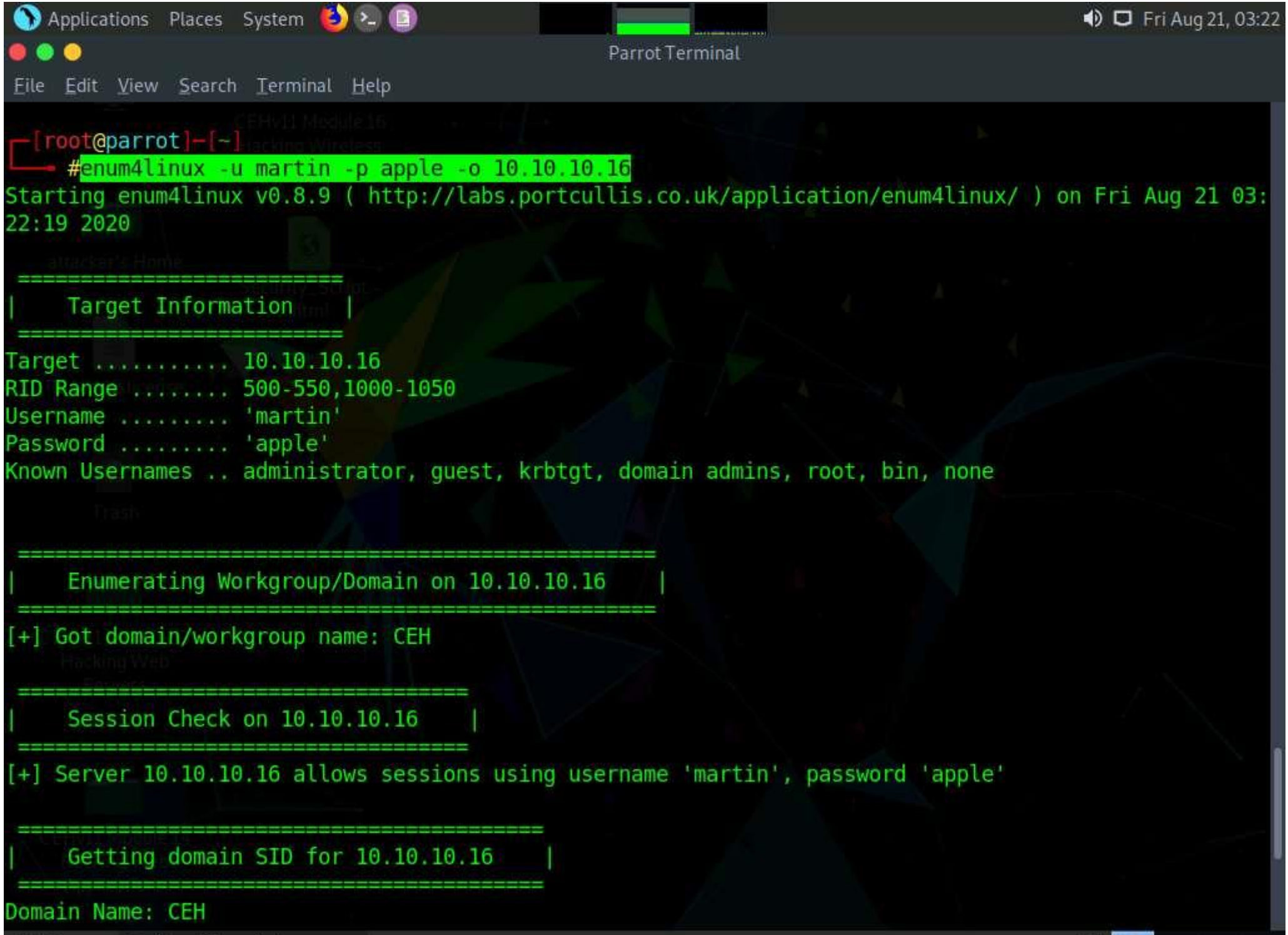

Applications Places System
Fri Aug 21, 03:15
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -u martin -p apple -U 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:15:14 2020
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH

11. Enum4linux starts enumerating and displays data such as Target Information, Workgroup/Domain, domain SID (security identifier), and the list of users, along with their respective RIDs (relative identifier), as shown in the screenshots below.

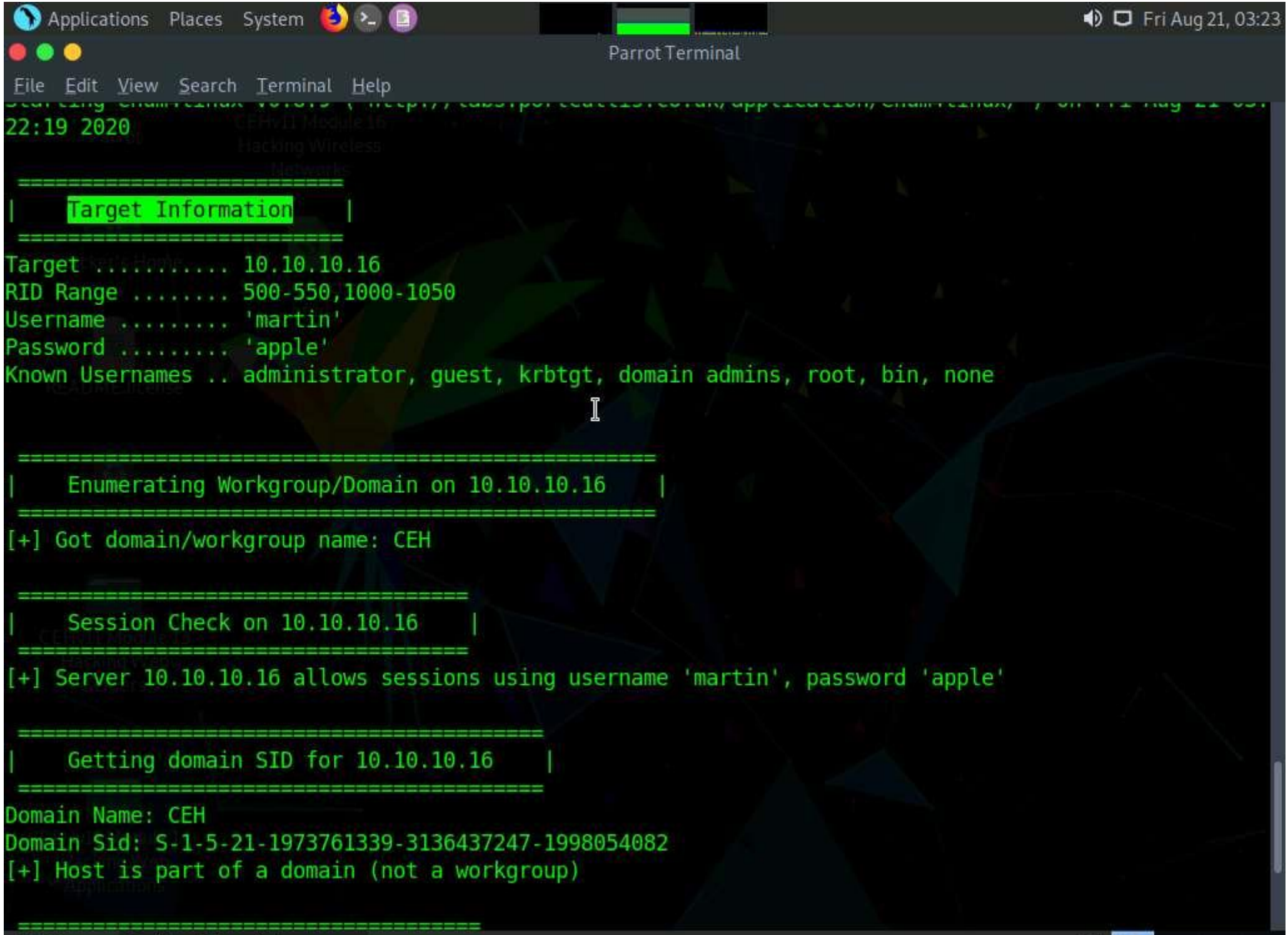

Applications Places System
Fri Aug 21, 03:16
Parrot Terminal
File Edit View Search Terminal Help
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082
[+] Host is part of a domain (not a workgroup)
| Users on 10.10.10.16 |

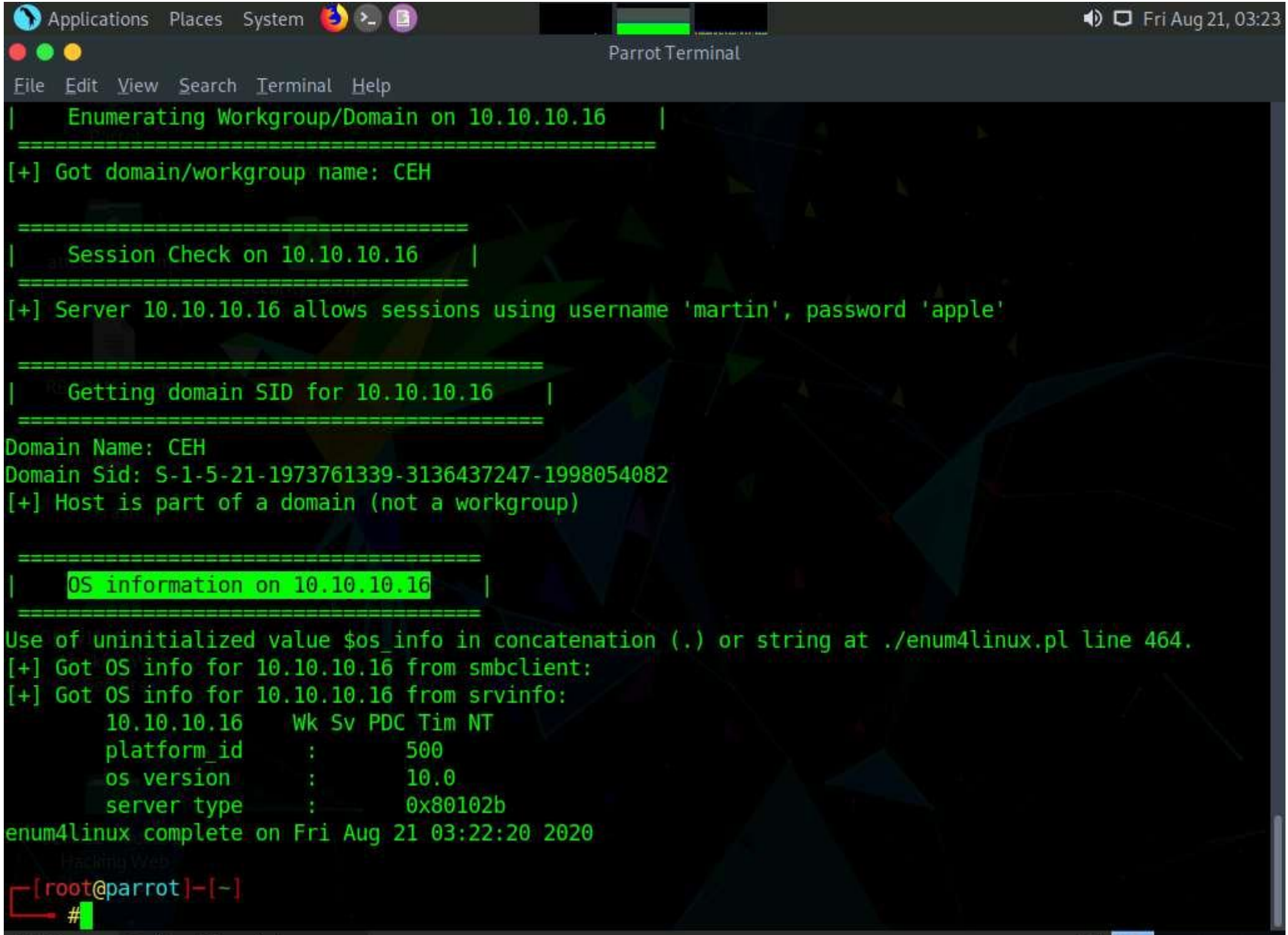

Applications Places System
Fri Aug 21, 03:16
Parrot Terminal
File Edit View Search Terminal Help
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082
[+] Host is part of a domain (not a workgroup)
| Users on 10.10.10.16 |
index: 0xfbc RID: 0x1f4 acb: 0x00000010 Account: Administrator Name: (null) Desc: Built-in account for administering the computer/domain
index: 0xfbe RID: 0x1f7 acb: 0x00000215 Account: DefaultAccount Name: (null) Desc: A user account managed by the system.
index: 0xfbd RID: 0x1f5 acb: 0x00000215 Account: Guest Name: (null) Desc: Built-in account for guest access to the computer/domain
index: 0x1091 RID: 0x450 acb: 0x00000210 Account: jason Name: Jason Desc: (null)
index: 0xff3 RID: 0x1f6 acb: 0x00000011 Account: krbtgt Name: (null) Desc: Key Distribution Center Service Account
index: 0x1092 RID: 0x451 acb: 0x00000210 Account: martin Name: Martin Desc: (null)
index: 0x1093 RID: 0x452 acb: 0x00000210 Account: shiela Name: Shiela Desc: (null)
user:[Administrator] rid:[0x1f4]
user:[Guest] rid:[0x1f5]
user:[krbtgt] rid:[0x1f6]
user:[DefaultAccount] rid:[0x1f7]
user:[jason] rid:[0x450]
user:[martin] rid:[0x451]
user:[shiela] rid:[0x452]
enum4linux complete on Fri Aug 21 03:15:14 2020
[root@parrot]-[~]
#

12. Second, we will obtain the OS information of the target; type **enum4linux -u martin -p apple -o [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter**.

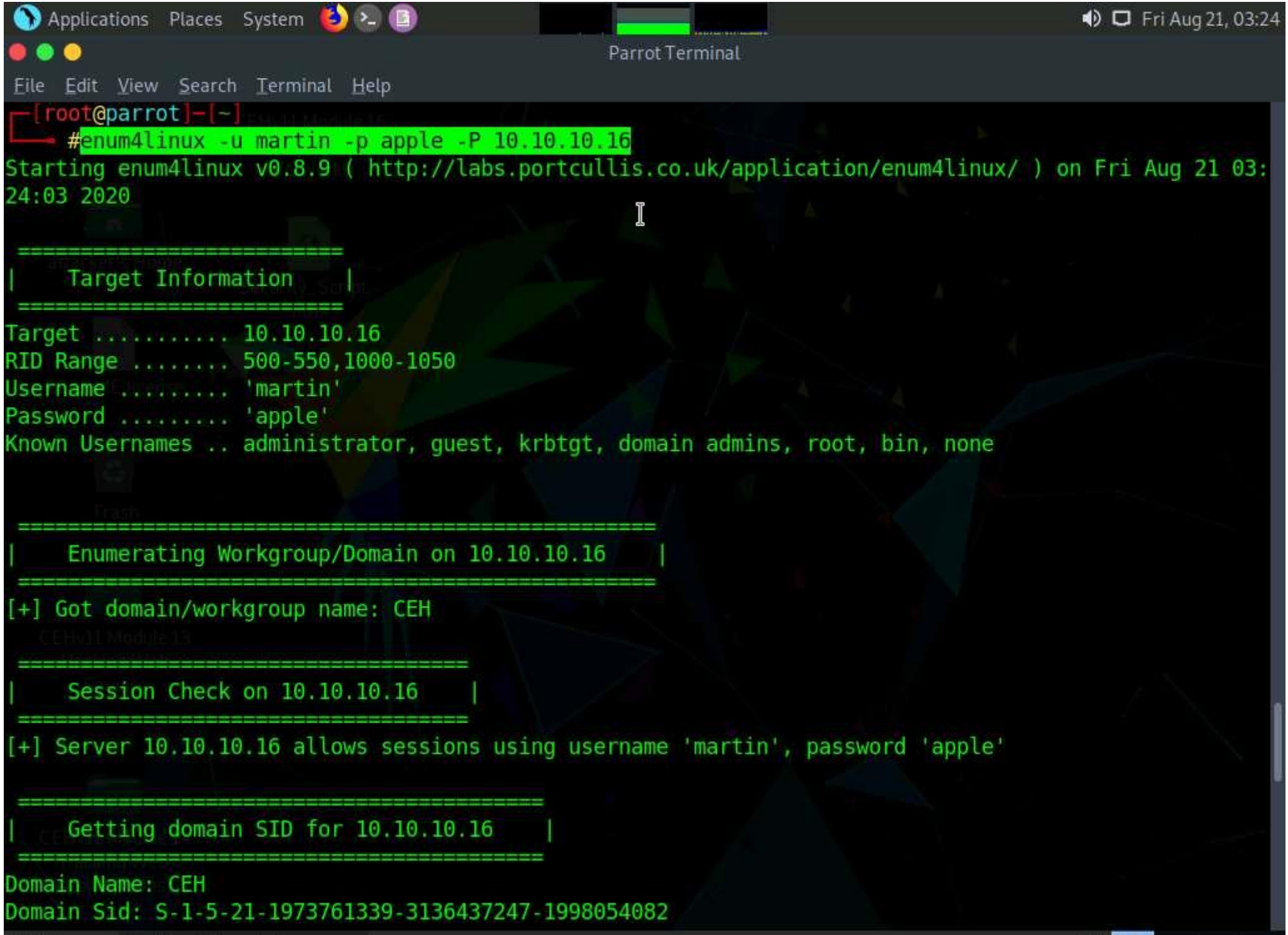

Applications Places System
Fri Aug 21, 03:22
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -u martin -p apple -o 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:22:19 2020
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH

13. ☐ The tool enumerates the target system and lists its OS details, as shown in the screenshot.

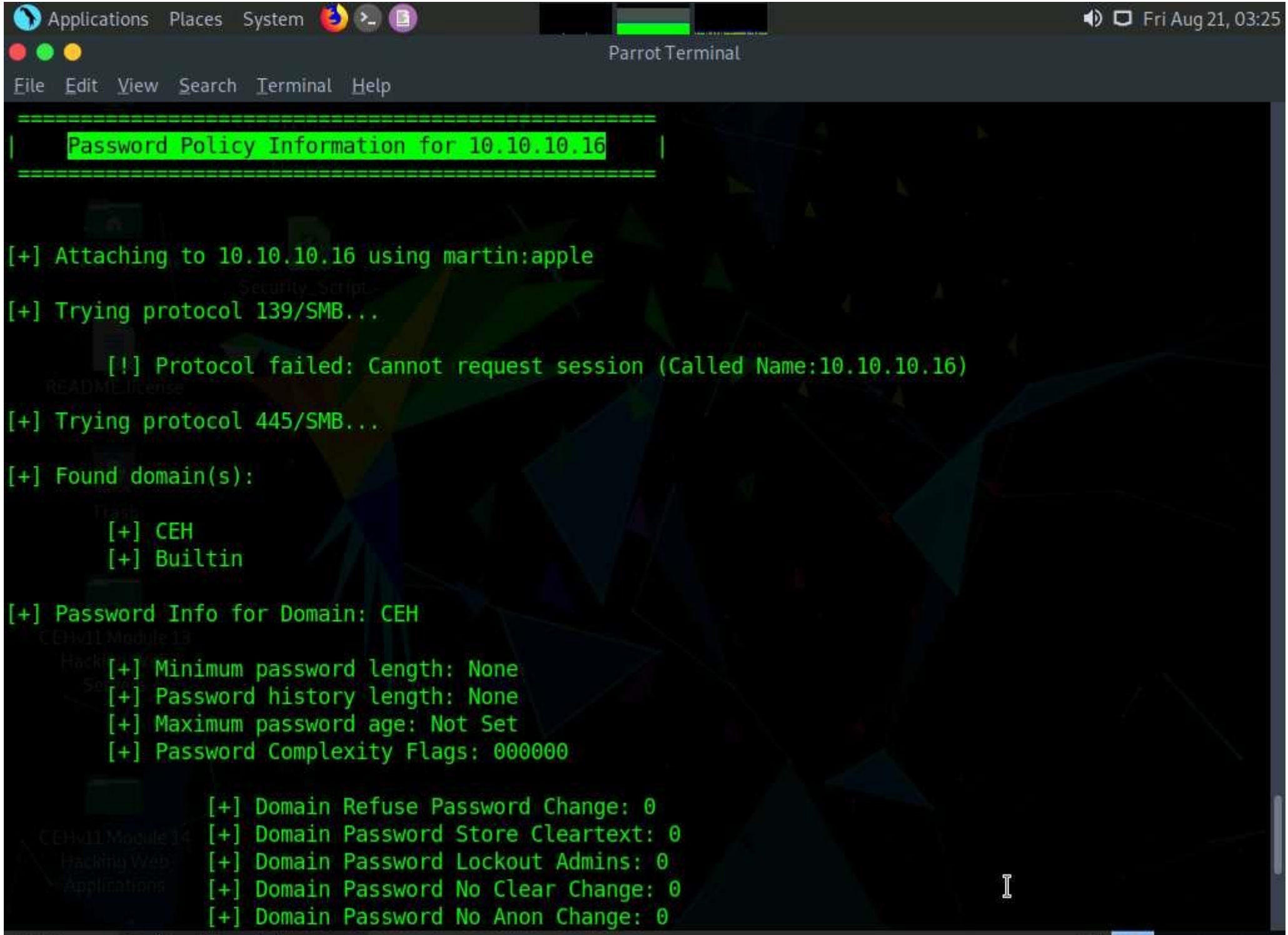

Applications Places System
Fri Aug 21, 03:23
Parrot Terminal
File Edit View Search Terminal Help
22:19 2020
Target Information
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
Enumerating Workgroup/Domain on 10.10.10.16
[+] Got domain/workgroup name: CEH
Session Check on 10.10.10.16
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
Getting domain SID for 10.10.10.16
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082
[+] Host is part of a domain (not a workgroup)


Applications Places System
Fri Aug 21, 03:23
Parrot Terminal
File Edit View Search Terminal Help
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082
[+] Host is part of a domain (not a workgroup)
| OS information on 10.10.10.16 |
Use of uninitialized value $os_info in concatenation (.) or string at ./enum4linux.pl line 464.
[+] Got OS info for 10.10.10.16 from smbclient:
[+] Got OS info for 10.10.10.16 from srvinfo:
10.10.10.16 Wk Sv PDC Tim NT
platform_id : 500
os version : 10.0
server type : 0x80102b
enum4linux complete on Fri Aug 21 03:22:20 2020
[root@parrot]-[~]
#

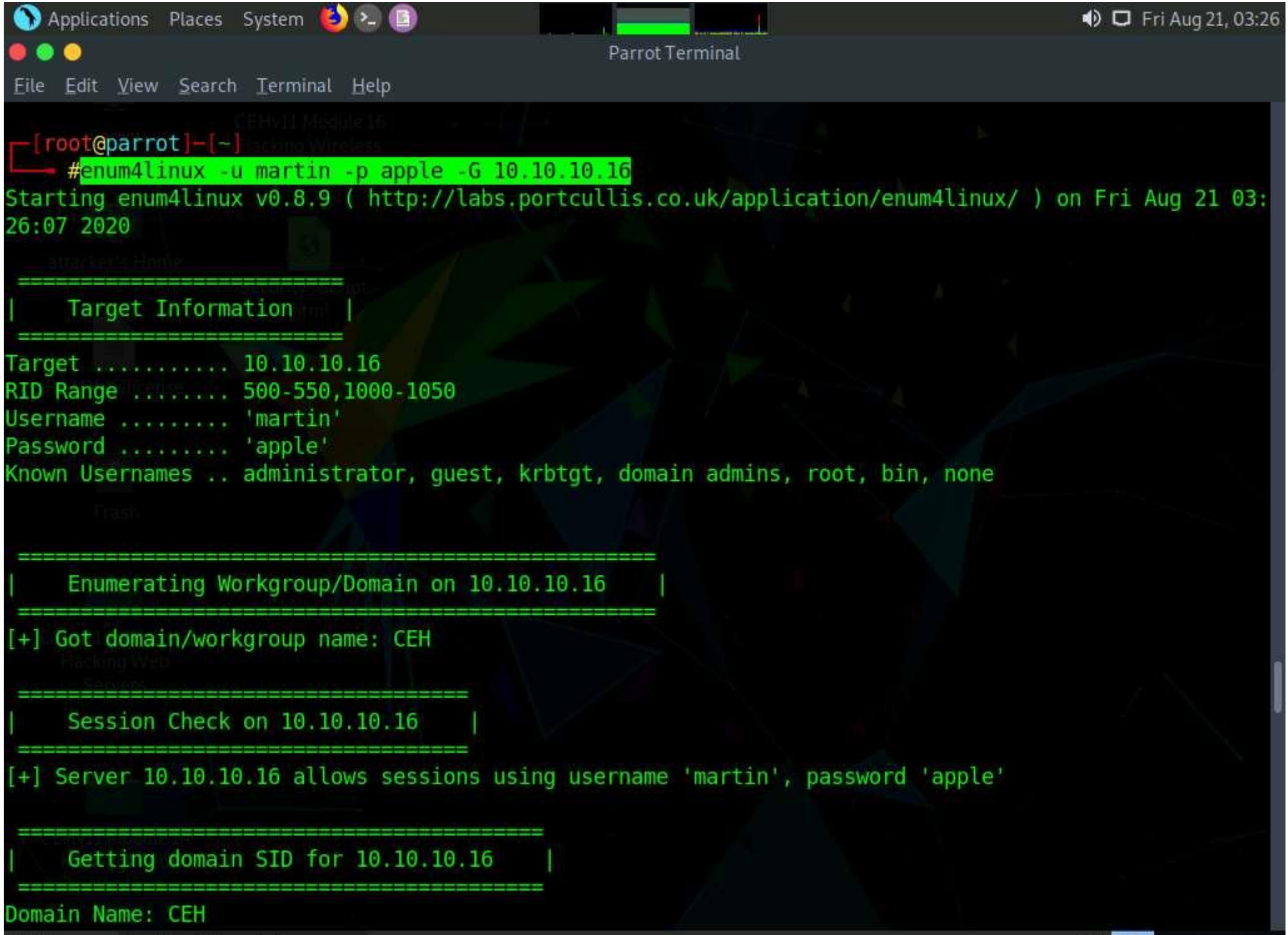
14. ☐ Third, we will enumerate the password policy information of our target machine. In the terminal window, type **enum4linux -u martin -p apple -P [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter**.


Applications Places System
Fri Aug 21, 03:24
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -u martin -p apple -P 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:24:03 2020
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082

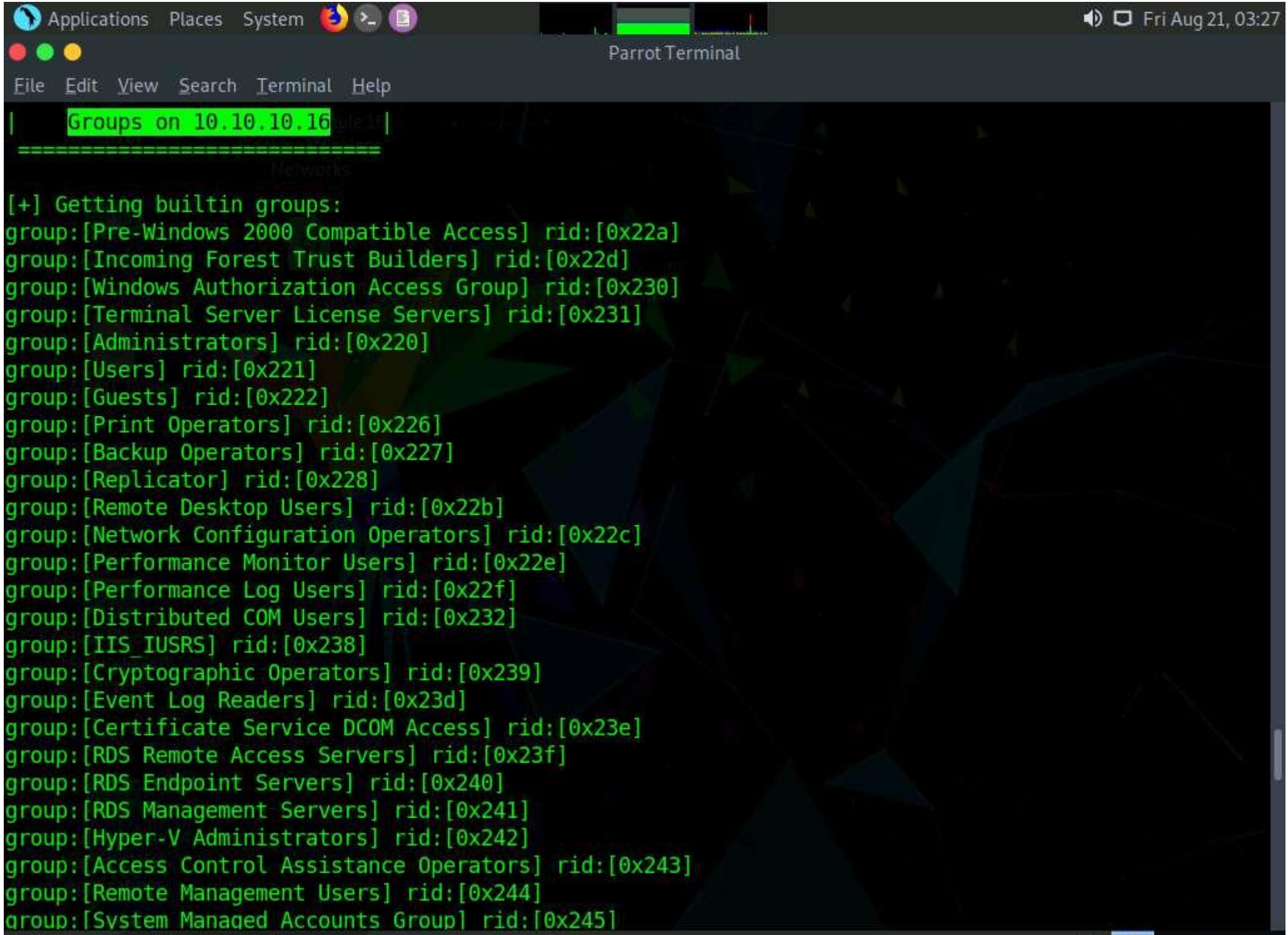
15. ☐ The tool enumerates the target system and displays its password policy information, as shown in the screenshot.


Applications Places System
Fri Aug 21, 03:25
Parrot Terminal
File Edit View Search Terminal Help
Password Policy Information for 10.10.10.16
[+] Attaching to 10.10.10.16 using martin:apple
[+] Trying protocol 139/SMB...
[!] Protocol failed: Cannot request session (Called Name:10.10.10.16)
[+] Trying protocol 445/SMB...
[+] Found domain(s):
[+] CEH
[+] Builtin
[+] Password Info for Domain: CEH
[+] Minimum password length: None
[+] Password history length: None
[+] Maximum password age: Not Set
[+] Password Complexity Flags: 000000
[+] Domain Refuse Password Change: 0
[+] Domain Password Store Cleartext: 0
[+] Domain Password Lockout Admins: 0
[+] Domain Password No Clear Change: 0
[+] Domain Password No Anon Change: 0

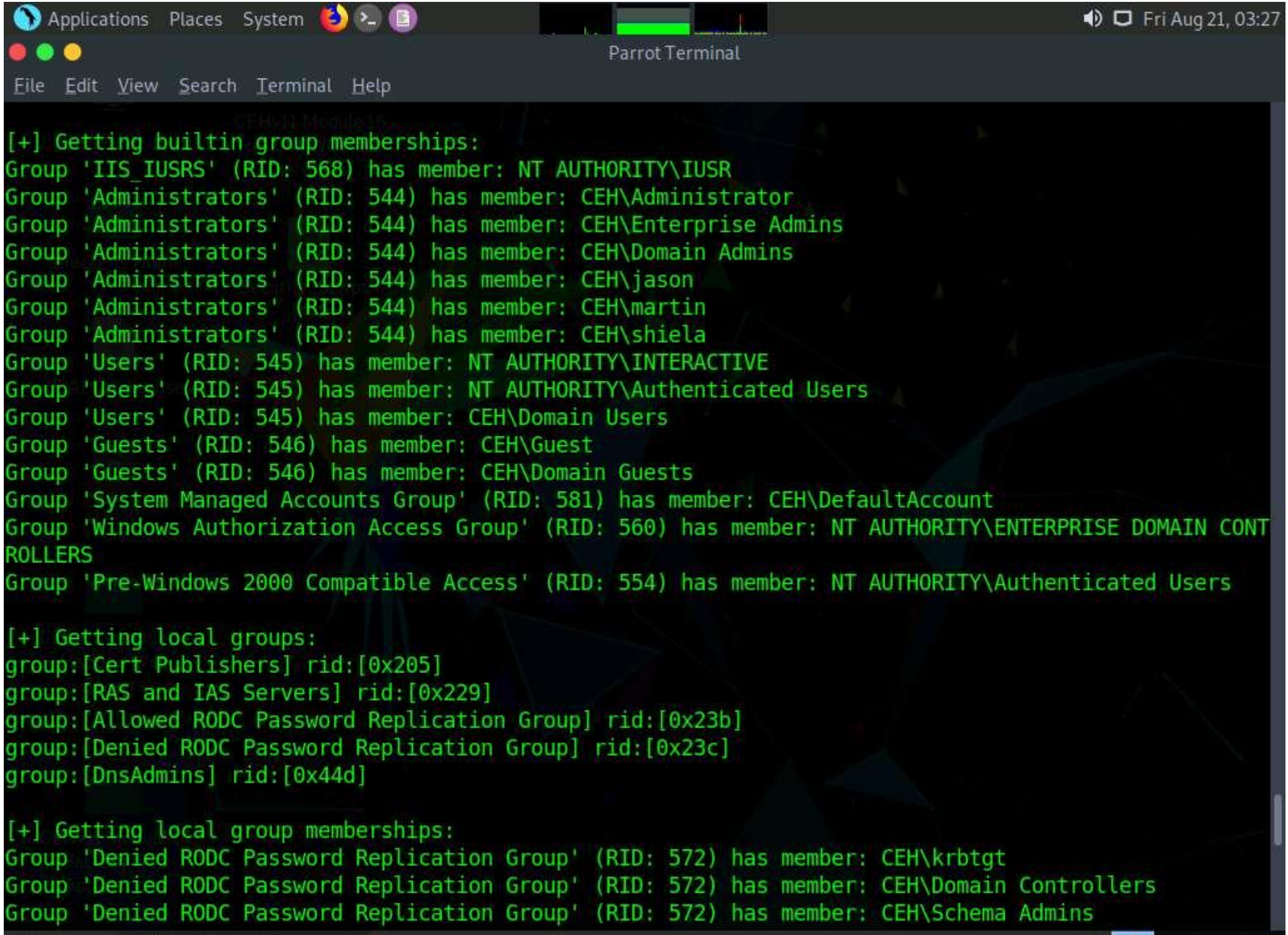
16. ☐ Fourth, we will enumerate the target machine's group policy information. In the terminal window, type **enum4linux -u martin -p apple -G [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter**.


Applications Places System
Fri Aug 21, 03:26
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -u martin -p apple -G 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:26:07 2020
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH

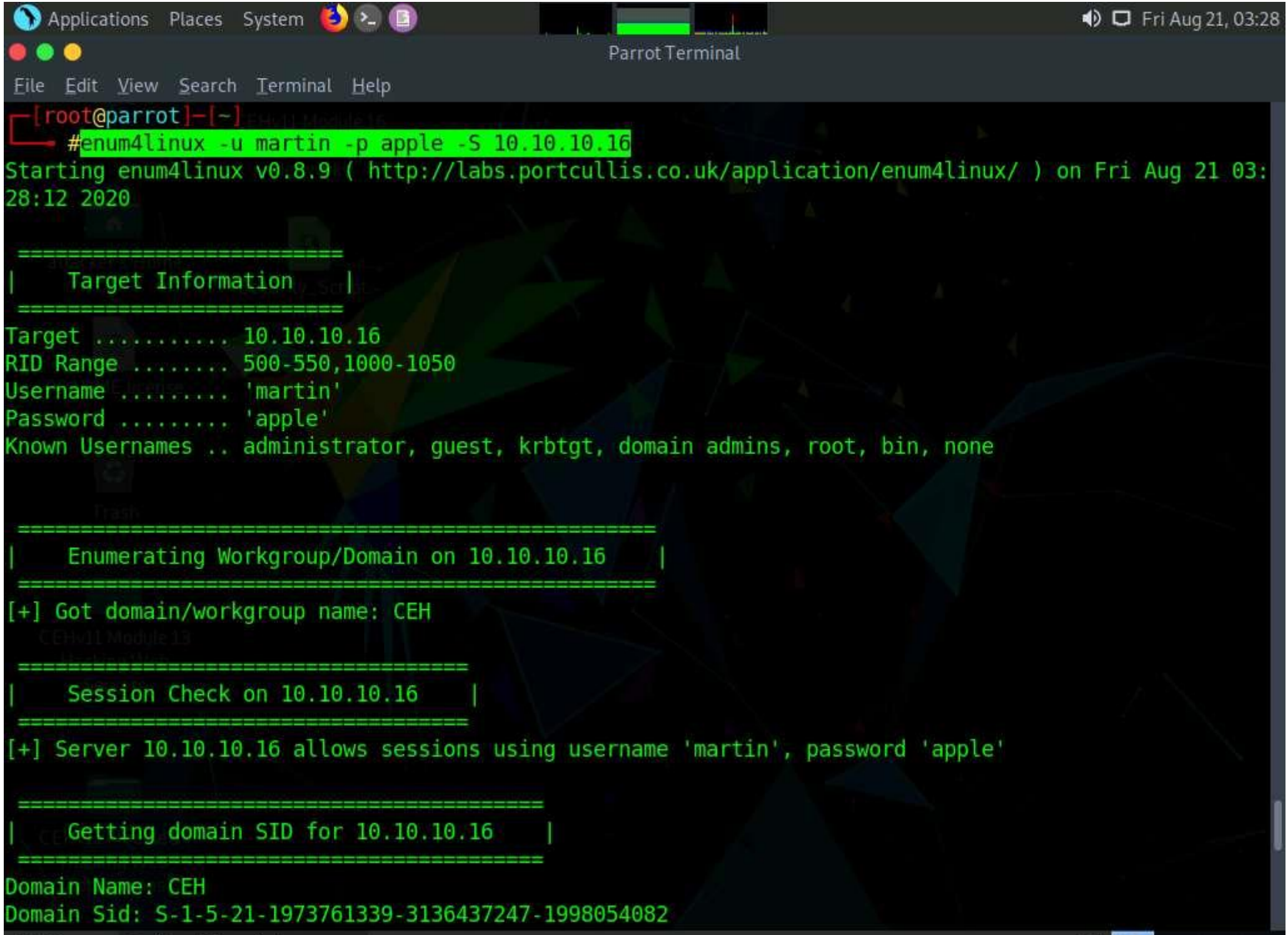
17. ☐ The tool enumerates the target system and displays the group policy information, as shown in the screenshot.


Applications Places System
Fri Aug 21, 03:27
Parrot Terminal
File Edit View Search Terminal Help
| Groups on 10.10.10.16 |
[+] Getting builtin groups:
group:[Pre-Windows 2000 Compatible Access] rid:[0x22a]
group:[Incoming Forest Trust Builders] rid:[0x22d]
group:[Windows Authorization Access Group] rid:[0x230]
group:[Terminal Server License Servers] rid:[0x231]
group:[Administrators] rid:[0x220]
group:[Users] rid:[0x221]
group:[Guests] rid:[0x222]
group:[Print Operators] rid:[0x226]
group:[Backup Operators] rid:[0x227]
group:[Replicator] rid:[0x228]
group:[Remote Desktop Users] rid:[0x22b]
group:[Network Configuration Operators] rid:[0x22c]
group:[Performance Monitor Users] rid:[0x22e]
group:[Performance Log Users] rid:[0x22f]
group:[Distributed COM Users] rid:[0x232]
group:[IIS_IUSRS] rid:[0x238]
group:[Cryptographic Operators] rid:[0x239]
group:[Event Log Readers] rid:[0x23d]
group:[Certificate Service DCOM Access] rid:[0x23e]
group:[RDS Remote Access Servers] rid:[0x23f]
group:[RDS Endpoint Servers] rid:[0x240]
group:[RDS Management Servers] rid:[0x241]
group:[Hyper-V Administrators] rid:[0x242]
group:[Access Control Assistance Operators] rid:[0x243]
group:[Remote Management Users] rid:[0x244]
group:[System Managed Accounts Group] rid:[0x245]

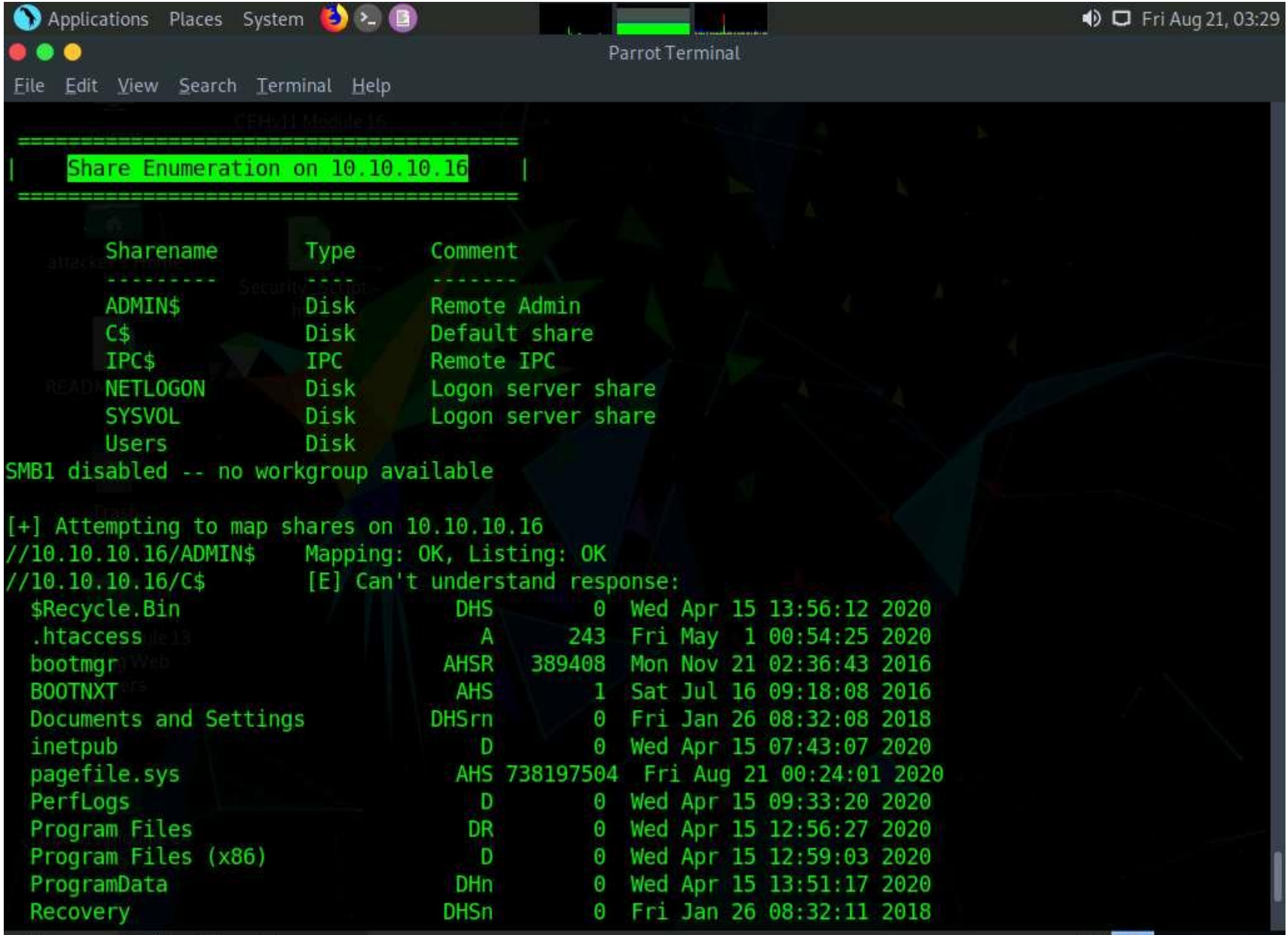
18. ☐ It further enumerates the built-in group memberships, local group memberships, etc. displaying them as shown in the screenshot.


Applications Places System
Fri Aug 21, 03:27
Parrot Terminal
File Edit View Search Terminal Help
[+] Getting builtin group memberships:
Group 'IIS_IUSRS' (RID: 568) has member: NT AUTHORITY\IUSR
Group 'Administrators' (RID: 544) has member: CEH\Administrator
Group 'Administrators' (RID: 544) has member: CEH\Enterprise Admins
Group 'Administrators' (RID: 544) has member: CEH\Domain Admins
Group 'Administrators' (RID: 544) has member: CEH\jason
Group 'Administrators' (RID: 544) has member: CEH\martin
Group 'Administrators' (RID: 544) has member: CEH\shiela
Group 'Users' (RID: 545) has member: NT AUTHORITY\INTERACTIVE
Group 'Users' (RID: 545) has member: NT AUTHORITY\Authenticated Users
Group 'Users' (RID: 545) has member: CEH\Domain Users
Group 'Guests' (RID: 546) has member: CEH\Guest
Group 'Guests' (RID: 546) has member: CEH\Domain Guests
Group 'System Managed Accounts Group' (RID: 581) has member: CEH\DefaultAccount
Group 'Windows Authorization Access Group' (RID: 560) has member: NT AUTHORITY\ENTERPRISE DOMAIN CONT
ROLLERS
Group 'Pre-Windows 2000 Compatible Access' (RID: 554) has member: NT AUTHORITY\Authenticated Users
[+] Getting local groups:
group:[Cert Publishers] rid:[0x205]
group:[RAS and IAS Servers] rid:[0x229]
group:[Allowed RODC Password Replication Group] rid:[0x23b]
group:[Denied RODC Password Replication Group] rid:[0x23c]
group:[DnsAdmins] rid:[0x44d]
[+] Getting local group memberships:
Group 'Denied RODC Password Replication Group' (RID: 572) has member: CEH\krbtgt
Group 'Denied RODC Password Replication Group' (RID: 572) has member: CEH\Domain Controllers
Group 'Denied RODC Password Replication Group' (RID: 572) has member: CEH\Schema Admins

19. ☐ Finally, we will enumerate the share policy information of our target machine. Type **enum4linux -u martin -p apple -S [Target IP Address]** (in this case, **10.10.10.16**) and hit **Enter**.


Applications Places System
Fri Aug 21, 03:28
Parrot Terminal
File Edit View Search Terminal Help
[root@parrot]-[~]
#enum4linux -u martin -p apple -S 10.10.10.16
Starting enum4linux v0.8.9 (http://labs.portcullis.co.uk/application/enum4linux/) on Fri Aug 21 03:28:12 2020
| Target Information |
Target 10.10.10.16
RID Range 500-550,1000-1050
Username ..... 'martin'
Password ..... 'apple'
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none
| Enumerating Workgroup/Domain on 10.10.10.16 |
[+] Got domain/workgroup name: CEH
| Session Check on 10.10.10.16 |
[+] Server 10.10.10.16 allows sessions using username 'martin', password 'apple'
| Getting domain SID for 10.10.10.16 |
Domain Name: CEH
Domain Sid: S-1-5-21-1973761339-3136437247-1998054082

20. ☐ The result appears, displaying the enumerate shared folders on the target system.


Applications Places System
Fri Aug 21, 03:29
Parrot Terminal
File Edit View Search Terminal Help
Share Enumeration on 10.10.10.16
Sharename Type Comment
ADMIN$ Disk Remote Admin
C$ Disk Default share
IPC$ IPC Remote IPC
NETLOGON Disk Logon server share
SYSVOL Disk Logon server share
Users Disk
SMB1 disabled -- no workgroup available
[+] Attempting to map shares on 10.10.10.16
//10.10.10.16/ADMIN$ Mapping: OK, Listing: OK
//10.10.10.16/C$ [E] Can't understand response:
$Recycle.Bin DHS 0 Wed Apr 15 13:56:12 2020
.htaccess A 243 Fri May 1 00:54:25 2020
bootmgr AHSR 389408 Mon Nov 21 02:36:43 2016
BOOTNXT AHS 1 Sat Jul 16 09:18:08 2016
Documents and Settings DHSrn 0 Fri Jan 26 08:32:08 2018
inetpub D 0 Wed Apr 15 07:43:07 2020
pagefile.sys AHS 738197504 Fri Aug 21 00:24:01 2020
PerfLogs D 0 Wed Apr 15 09:33:20 2020
Program Files DR 0 Wed Apr 15 12:56:27 2020
Program Files (x86) D 0 Wed Apr 15 12:59:03 2020
ProgramData DHn 0 Wed Apr 15 13:51:17 2020
Recovery DHSn 0 Fri Jan 26 08:32:11 2018

21. ☐ This concludes the demonstration performing enumeration using Enum4linux.
22. ☐ Close all open windows and document all the acquired information.