Welcome to Cyber Aces Online, Module 1! A firm understanding of operating systems is essential to being able to secure or attack one. This module dives in to the Microsoft Windows Operating System, specifically Windows networking and sharing.

SANS CYBER ACES ONLINE TUTORIALS
YOUR GATEWAY TO CYBERSECURITY SKILLS AND CAREERS

1. Introduction to Operating Systems
   - 01. Linux
   - 02. Windows

2. Networking

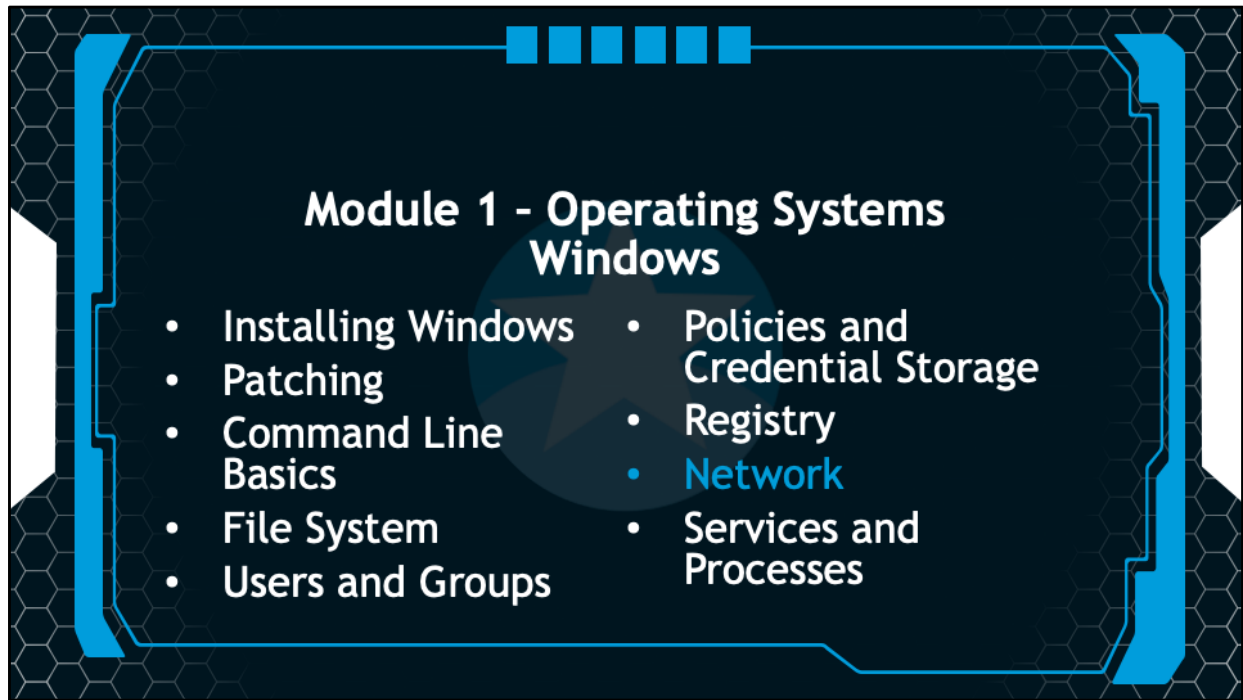3. System Administration
   - 01. Bash
   - 02. PowerShell
   - 03. Python

This training material was originally developed to help students, teachers, and mentors prepare for the Cyber Aces Online Competition. This module focuses on the basics of what an operating systems is as well as the two predominant OS's, Windows and Linux. This session is part of Module 1, Introduction to Operating Systems. This module is split into two sections, Linux and Windows. In this session, we will continue our examination of Windows.

The three modules of Cyber Aces Online are Operating Systems, Networking, and System Administration.

For more information about the Cyber Aces program, please visit the Cyber Aces website at https://CyberAces.org/.

Module 1 – Operating Systems
Windows

- Installing Windows
- Patching
- Command Line Basics
- File System
- Users and Groups
- Policies and Credential Storage
- Registry
- Network
- Services and Processes

In this session we will discuss Windows networking.

Networking – SMB

SMB stands for Server Message Block

Used for sharing
- Files
- Printers
- Other Resources

Allows mapping network drives using the NET command

To see all of the available commands available with NET run:

```
C:\> net /?
```

The Windows Operating System can support a variety of networking protocols to share resources, but SMB is by far the most widely used. SMB or Server Message Block is used to share files, printer and other networking resources between Windows hosts. You access resources on a remote system by mapping the drive through Windows Explorer, by clicking START >RUN and entering the UNC, or mapping the drive at the command line.

NET VIEW

List the available (shared) resources on a system

```
C:\> net view \\servername
Shared resources at \\servername
Share name  Type     Comment
----------------------------------------------

HP              Print
Pub             Disk     Public access
Private         Disk     My Stuff, STAY OUT!
```

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The "net view" command can be used to perform most of the browsing functions available via "Network " or "My Computer." Running the command without options will list computers in the current domain or workgroup. To see the resources available on a system, type "net view" followed by two backslashes and the system name:

```
C:\> net view \\servername
```

```
Shared resources at \\servername
Share name     Type               Comment
-----------------------------------------------------------

HP             Print
pub            Disk               Public access
private        Disk               My Stuff, STAY OUT!
```

NET USE

Used to connect or disconnect a remote resource, typically a file share
- Also used to display a list of connections to remote resources

Get help:

```
net use /?
```

Map drive using current credentials:

```
net use z: \\srvr\pub
```

Map drive using alternate credentials, password entered by prompt:

```
net use z: \\srvr\pub * /user:john
```

Map drive using alternate credentials, including password:

```
net use z: \\srvr\pub P@55wd /user:john
```

When mapped, it can be accessed like any other drive

The "net use" command is used to connect or disconnect from remote resources, typically file servers or network shares. The command can also be used to list open connections to these remote resources.

When connecting to a remote system, the double backslash (\\) must be used before the server's name. The Share name must also be preceded by a backslash. E.g.

\\servername\sharename

A drive letter can be specified to "mount" the remote resource. Your computer will authenticate as the currently logged in user.

```
C:\> net use z: \\srvr\pub
```

In addition, alternate credentials can be used to access the resource, either in the command itself:

```
C:\> net use z: \\srvr\pub P@55wd /user:john
```

…or via a more secure password prompt using the asterisk (*) in place of the password:

```
C:\> net use z: \\srvr\pub * /user:john
```

Similar to the net user command, the password can be entered as part of the command.

NET USE (2)

Delete the mapping by drive letter:

```
net use z:  /delete
```

Delete the mapping by share:

```
net use \\srvr\sharename /delete
```

Delete all mappings:

```
net use * /delete
```

We can also remove the mapping we created previously using the /delete switch. Think of delete as the eject button for network shares.

We can delete a single mapping in either of these two ways, by drive letter:

```
C:\> net use z: /delete
```

Or by sharename:

```
C:\> net use \\servername\sharename /delete
```

We can also delete all the mappings:

```
C:\> net use * /delete
```

NET USE & VIEW Review

You are trying to access a share named "FILES" on a server named "SERVER". Your account has permissions to access that directory. How would you map a drive to this server?
- A) net use * \\server\files
- B) net use z: \\server\files
- C) mount \\server\files z:
- D) A or B

Which of the following commands will list the files on a remote share?
- dir \\servername\share
- dir <IPADDRESS>\share
- net use \\servername\share
- net view \\servername\share

You are trying to access a share named "FILES" on a server named "SERVER". Your account has permissions to access that directory. How would you map a drive to this server?

        A) net use * \\server\files
        B) net use z: \\server\files
        C) mount \\server\files z:
        D) A or B

Which of the following commands will list the files on a remote share?

        dir \\servername\share
        dir <IPADDRESS>\share
        net use \\servername\share
        net view \\servername\share

Answers

You are trying to access a share named "FILES" on a server named "SERVER". Your account has permissions to access that directory. How would you map a drive to this server?

- D) A or B
- Both "net use * \\server\files" and "net use z: \\server\files" will accomplish the same thing. When the asterisk is used instead of a specific drive letter, the operating system will pick a letter for you.

Which of the following commands will list the files on a remote share?

- dir \\servername\share
- The dir command is used to list files and it can be used with UNC paths. The command "dir \\ipaddress\share" will work, but the answer on the previous slide did not include the leading double backslashes.

You are trying to access a share named "FILES" on a server named "SERVER". Your account has permissions to access that directory. How would you map a drive to this server?

> D) A or B
> Both "net use * \\server\files" and "net use z: \\server\files" will accomplish the same thing. When the asterisk is used instead of a specific drive letter, the operating system will pick a letter for you.

Which of the following commands will list the files on a remote share?
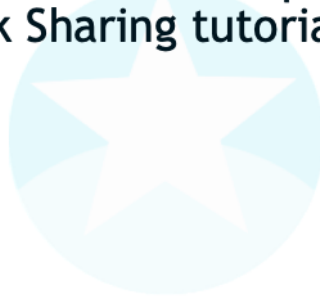
> dir \\servername\share
> The dir command is used to list files and it can be used with UNC paths. The command "dir \\ipaddress\share" will work, but the answer on the previous slide did not include the leading double backslashes.
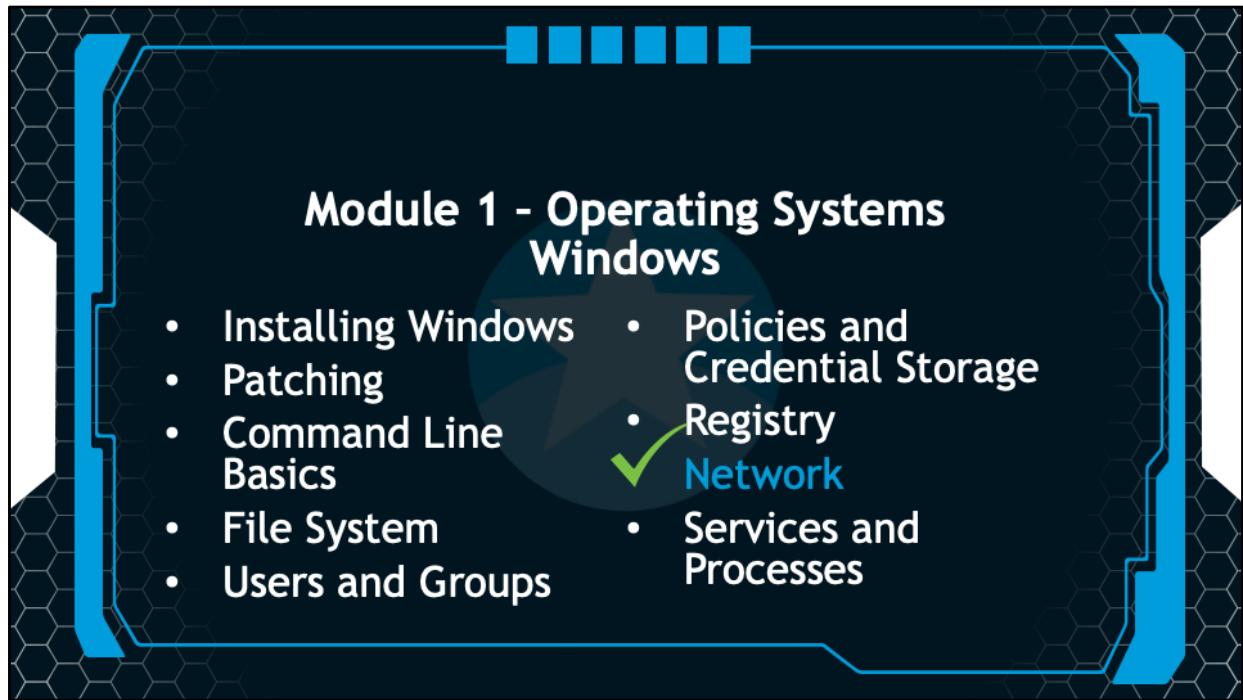
Exercise Complete!

Congratulations! You have completed the Windows Network Sharing tutorial

Congratulations, you have completed the tutorial on Windows file sharing.

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In the next session, we will discuss Windows services and processes.