



# Post Exploitation with Meterpreter

Cybersecurity  
Penetration Testing Day 5



# Class Objectives

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By the end of today's class, you will be able to:



Establish bind and reverse shells using Ncat.



Set Meterpreter payloads on a target.



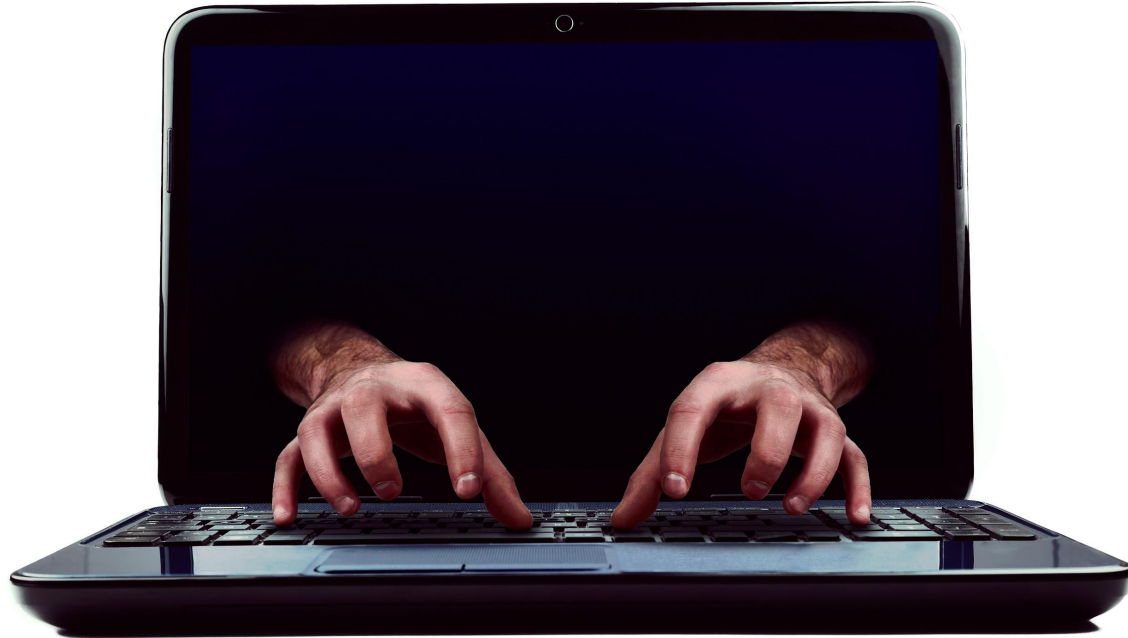
Use Meterpreter shells to exfiltrate data from the target machine.

Last class we learned about the Metasploit framework and used **MSFconsole** to exploit multiple vulnerabilities.



After successful exploitation in which a session is established, Metasploit acts as a **command and control (C2)** server.

This means it is able to pass commands to exploited victim computers.



# C2 Servers

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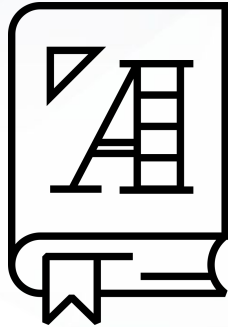
C2 servers are important during the post-exploitation phase of pen testing. This is when attackers will try to perform tasks like data exfiltration, moving data from the victim computer to the host.





While there are a variety of C2 frameworks, today we'll learn specifically about Metasploit and its Meterpreter modules.

# Payloads and Shells



A **payload** is the shell code that runs after an exploit successfully compromises a system.



# Payloads

When we exploited Shellshock, the payload was automatically determined. For example, payloads may need to be customized for:  
But there may be times when we require a custom payload.

01

**A specific OS and architecture.** A 64-bit payload is very different from 32-bit.

02

**Size.** Some exploits can only handle a certain size payload. If a payload is too big, it will fail.

03

**Functionality.** Certain types of payloads allow more functionality than others, such as Meterpreter payloads, which are used by Metasploit exploits.



# Staged vs. Stageless Payloads



Depending on what size payloads the exploit can handle, we can make payloads staged or stageless.

01

## Staged Payloads

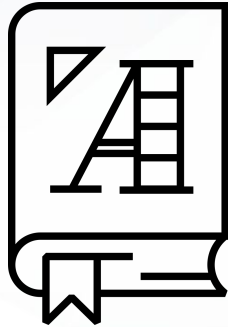
Staged payloads come in parts in order to minimize their initial payload size.

Upon exploitation, the payload calls the rest of the payload from the staged location.

02

## Stageless Payloads

Stageless payloads are complete payloads, significantly larger than staged payloads.



A **shell** is the connection that the payload establishes between the target and attacking machine.

# Shells

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A shell can establish two types of connections:

01

## Bind Shells

A bind shell uses a payload that opens a port on a victim host and listens on that port for an incoming connection from the attacker host.

02

## Reverse Shells

A reverse shell uses a payload that automatically reaches back out to the attacker host to establish a session.

In **bind shells**, attackers  
connect to victims.

In **reverse shells**, victims  
connect to attackers.



In the following demonstration,  
we will use Ncat to create  
bind and reverse shells.



# Instructor Demonstration

## Bind and Reverse Shells



## **Activity:** Bind and Reverse Shells

In this activity, you will use Ncat to create a bind and a reverse shell.

**Suggested Time:**  
20 Minutes

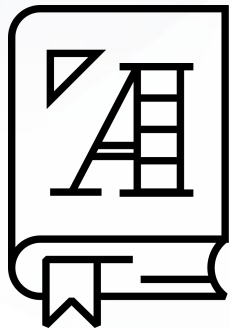






**Time's Up!** Let's Review.

# Meterpreter



**Meterpreter** is Metasploit's proprietary reverse shell.



Metasploit allows you to exploit a target and establish a Meterpreter connection in a single step.

# Meterpreter

Meterpreter provides more functionality than a normal shell. It offers powerful tools provided by Metasploit modules. Built-in commands allow us to:

01

Upload and download files to and from a target.

02

Set up port forwarding through the target.

03

Support encrypted communication.

04

Switch between Meterpreter shells.

05

Run Metasploit modules on remote hosts.



# Meterpreter

In addition to these capabilities, Meterpreter is engineered to be difficult to detect, leaving minimal traces on victim machines or the network.



Runs entirely in memory, meaning it does not create files on the target.



Does not start any new processes on the victim, instead "injecting" itself into a program that's already running. (An SSH session launches a new shell process.)



Encrypts all communication to and from the victim machine.



# Meterpreter Sessions



Opening a Meterpreter session on a target host consists of four main steps:

01

Exploiting the target.

02

Uploading a Meterpreter payload on the target.

03

Starting a TCP listener.

04

Executing the Meterpreter payload.

# Meterpreter Sessions



Opening a Meterpreter session on a target host consists of four main steps:

01

Exploiting the target.

02

Uploading a Meterpreter payload on the target.

03

Starting a TCP listener.

04

Executing the Meterpreter payload.

In practice,  
this is equal  
to setting up and  
running the exploit.



# Meterpreter Commands

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We can list all open Meterpreter sessions by running:

The easiest way to open a Meterpreter shell is to select an exploit and set its payload to a Meterpreter binary.

We `sessions` with:

```
sessions -i <session ID>
```

Once we connect to a session, any command we type is run on the Meterpreter shell on the victim, instead of in MSFconsole on our attacking machine.

# Meterpreter Commands

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| Command              | Action  |
|----------------------|---|
| <b>?</b>             | Prints Meterpreter help page.   |
| <b>getuid</b>        | Prints user ID.   |
| <b>getwd</b>         | Prints current working directory.   |
| <b>ifconfig</b>      | Prints victim's network information.  |
| <b>sysinfo</b>       | Gathers system information (OS, architecture, kernel version).                        |
| <b>upload</b>        | Uploads a file to the target.   |
| <b>download</b>      | Downloads a file from the target.   |
| <b>search</b>        | Finds a resource.   |
| <b>run win_privs</b> | Provides detailed Windows privileged information.                                     |
| <b>run win_enum</b>  | Runs a suite of Windows enumerations and stores the results on the attacking machine. |



## **Activity:** Meterpreter Basics

In this activity, you will solidify your understanding of basic Meterpreter functions and commands.

**Suggested Time:**  
15 Minutes





**Time's Up!** Let's Review.





Countdown timer

**15:00**

(with alarm)

# Meterpreter Exploitation Demonstration





In this demonstration, we will use our Kali machine to create a custom payload that we will use to exploit a vulnerable Windows host (DVW10).

We will then create a Meterpreter shell on our Kali machine.

# Payload and Meterpreter Demo

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In real world attacks, it is common for payloads to be delivered through phishing emails and other social engineering tactics.

When an unsuspecting user clicks a link, a malicious file is downloaded onto their machine.





# Payload and Meterpreter

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For the demo, we will switch over to the Windows 10 machine after creating the custom payload on our Kali machine.

01

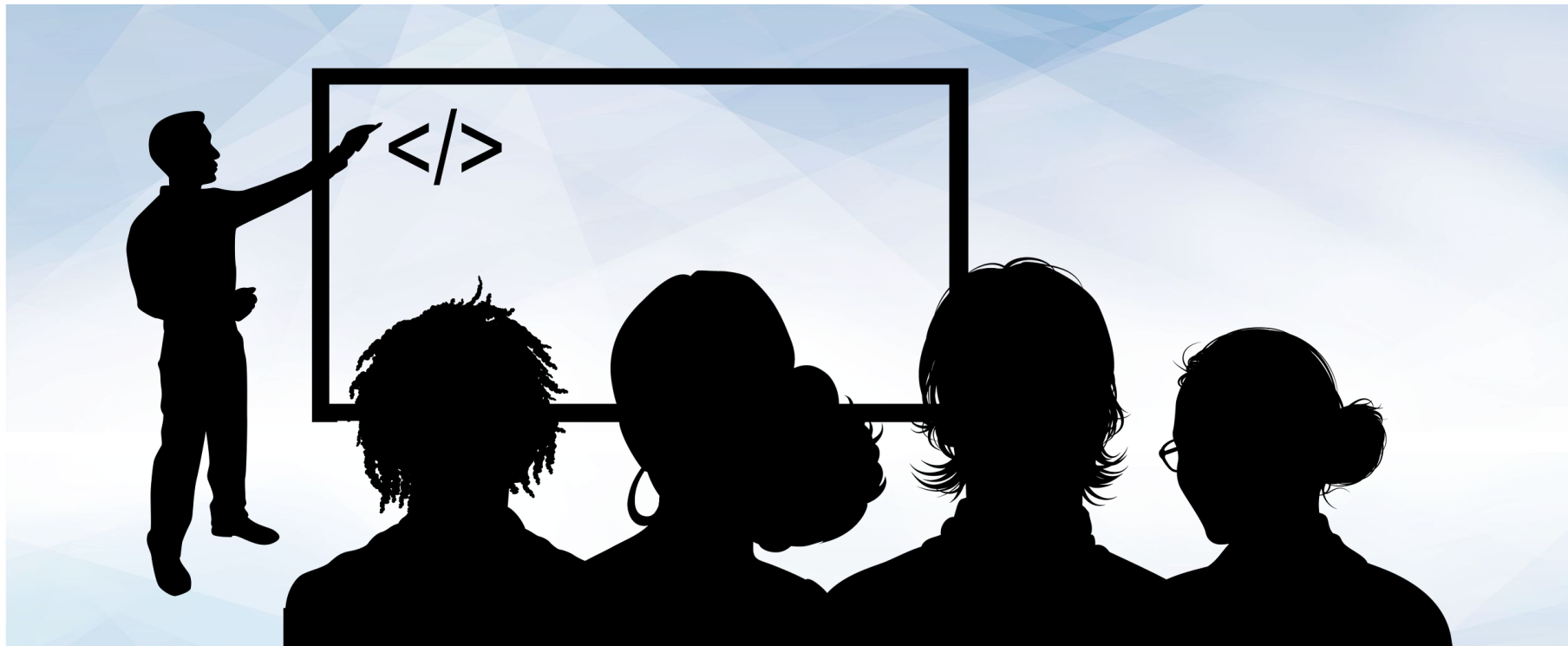
We will assume that the executable was downloaded onto the Windows machine, which we will find in the Downloads folder.

02

When this payload is executed (when the user clicks on the malicious EXE file), a Meterpreter shell is created on the Kali machine.

03

We can use this shell to command and control the Windows machine, gathering files and user, system, and application information.



# Instructor Demonstration

## Meterpreter



## **Activity:** Meterpreter Shells

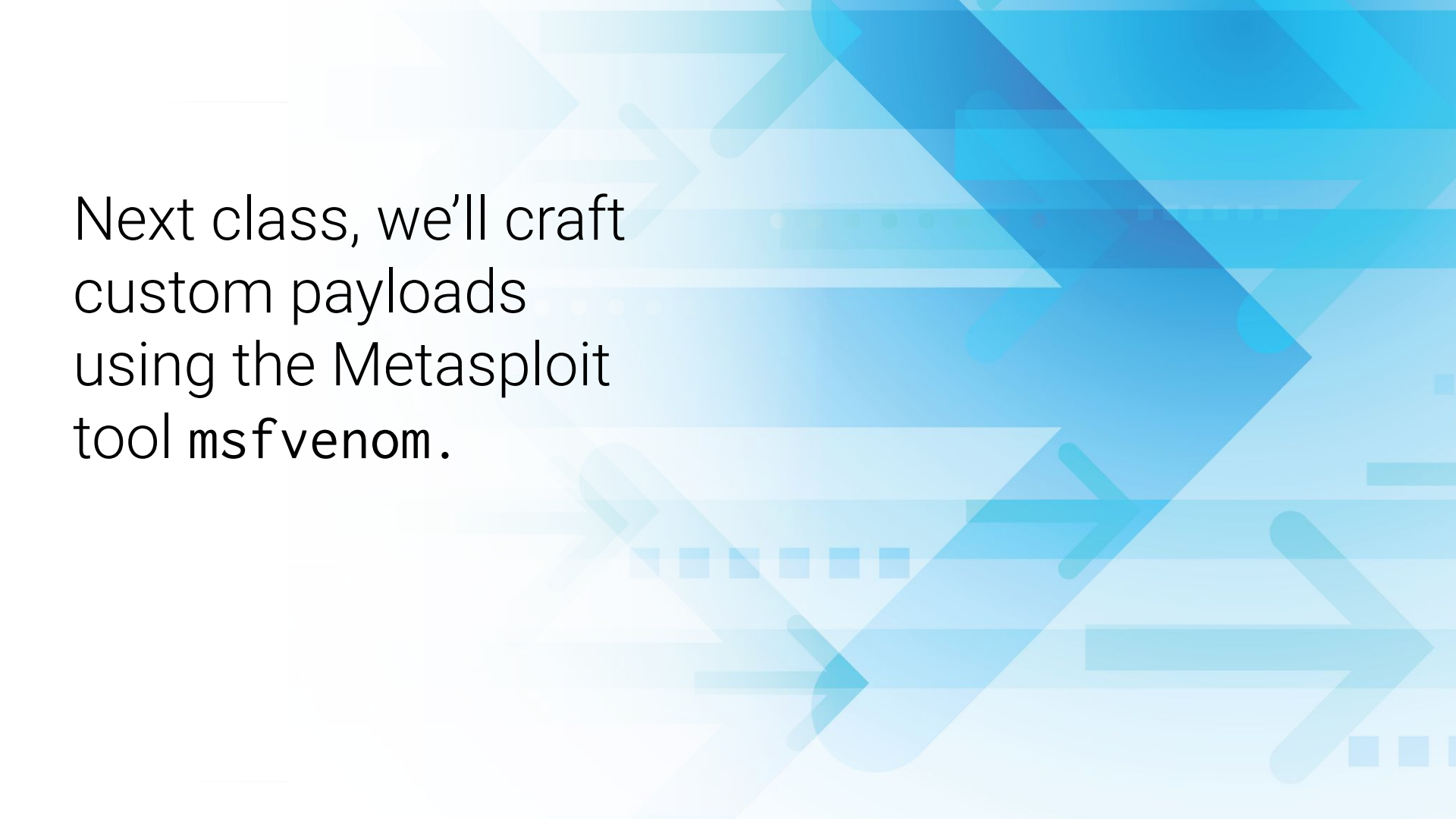
In this activity, you will craft malware, establish a Meterpreter session on a target machine, and extract sensitive information.

**Suggested Time:**  
20 Minutes





**Time's Up!** Let's Review.



Next class, we'll craft  
custom payloads  
using the Metasploit  
tool `msfvenom`.



Questions?

*The  
End*