

# Writing Basic Security Tools using Python

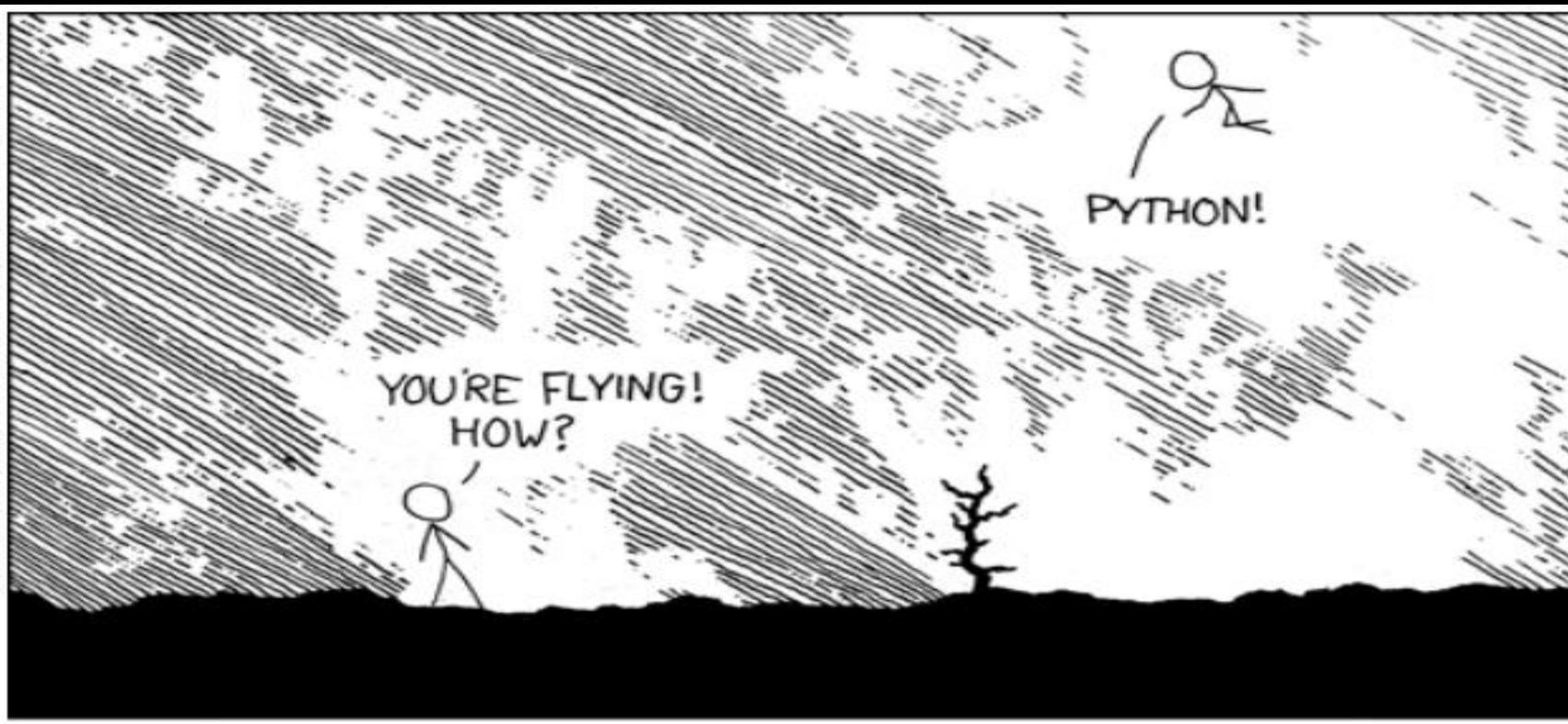
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*Special thanks to Keith Dixon @Tazdrumm3r  
for sharing his work...*

```
>>> import antigravity
```

---



I LEARNED IT LAST NIGHT! EVERYTHING IS SO SIMPLE!  
I  
HELLO WORLD IS JUST  
print "Hello, world!"

I DUNNO...  
DYNAMIC TYPING?  
WHITESPACE?  
COME JOIN US!  
PROGRAMMING IS FUN AGAIN!  
IT'S A WHOLE NEW WORLD UP HERE!  
BUT HOW ARE YOU FLYING?

I JUST TYPED  
import antigravity  
THAT'S IT?  
I  
... I ALSO SAMPLED  
EVERYTHING IN THE  
MEDICINE CABINET  
FOR COMPARISON.  
I  
BUT I THINK THIS  
IS THE PYTHON.

# Outline

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- About Python
- Python Basics
  - Types
  - Controls
- Python Functions and Modules
- Python Tips and Tricks
- Coding for Penetration Testers

# About Python

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- Python is an open source programming language.
- Development started by Guido van Rossum in December 1989.
  - Conceived in the late 1980's
  - Python 2.0 was release on October 16th, 2000
  - Python 3.0 was released on December 2008
- Name came from TV series “**Monty Python's Flying Circus**”.

# About Python – Cont.

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- Python is cross platform
  - Linux (shipped out of the box)
  - Windows (easy to install)
  - Mac
  - Even work on your Droid!
  - etc

# Why Learn Python?

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- Lot of people always ask me “**Why learn Python**”?
- The answer is simple:
  - Simple and easy to learn
  - Free and Open Source
  - Powerful high-level programming language
  - Widely used (Google, NASA, Yahoo, etc)
  - Portable
  - **HUGE** number of Extensive Libraries!

# What is Python Good for?

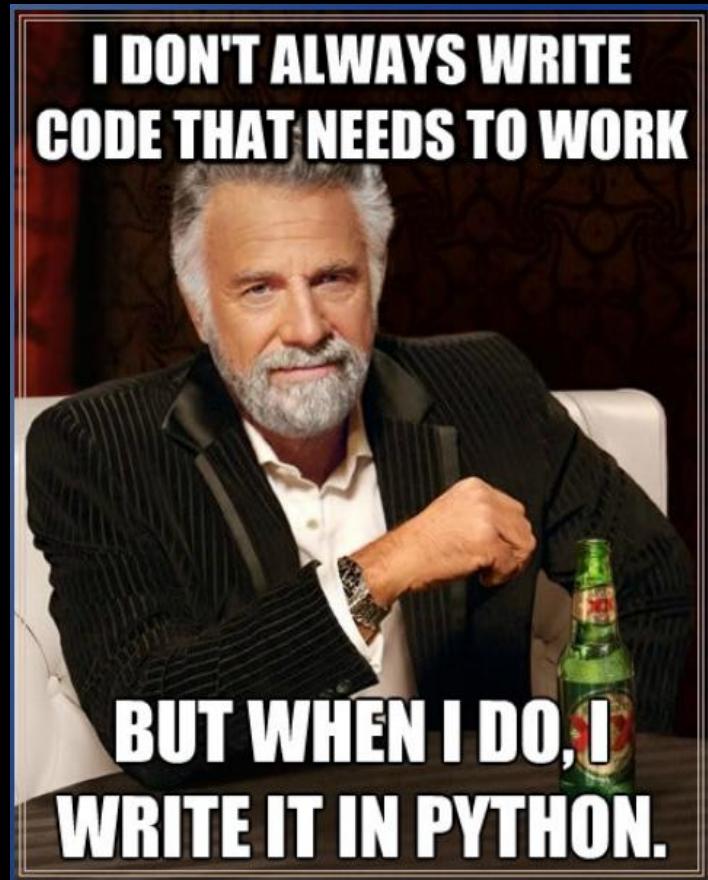
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- Ideal language for scripting and rapid application development in many areas on most platforms.
- All computer related subjects (IMO except system programming)
- Performing System Administration Tasks
- Encouraging and Helping Children start programming

# What About Security?

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- Extensive use in the information security industry
  - Exploit Development
  - Networking
  - Debugging
  - Encryption/Decryption
  - Reverse Engineering
  - Fuzzing
  - Web
  - Forensics
  - Malware analysis



# Let's Start Working

---

- Interactive Interpreter

```
root@kali:~# python
Python 2.7.3 (default, Jan  2 2013, 13:56:14)
[GCC 4.7.2] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

- Text Editors
  - Vim, Nano,  
Geany (my favorite)  
Gedit, Kate,  
Notepad++, etc

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3
4 # Code goes below
5
6
7
8
9
```

# Python Basics

---

- Integers (int)

```
>>> httpPort=80
```

```
>>> Subnet=24
```

- Floating Point (float)

```
>>> 5.2/2
```

```
2.6
```

- Strings (str)

```
>>> url="http://www.linuxac.org/"
```

# Playing with Strings

---

One of the most powerful capabilities of Python

- String Slicing

```
>>> logFile="/var/log/messages"
```

```
>>> logFile[0]
```

```
'/'
```

```
>>> logFile[1:4]
```

```
'var'
```

```
>>> logFile[-8:]
```

```
'messages'
```

```
>>> logFile.split("/")
```

```
['', 'var', 'log', 'messages']
```

# Playing with Strings – Cont.

---

- String Concatenation

```
>>> userName = "binary"  
>>> domainName = "linuxac.org"  
>>> userEmail = userName + "@" + domainName  
>>> userEmail  
'binary@linuxac.org'
```

```
>>> website="http://www.linuxac.org/"  
>>> param="?p=123"  
>>> url = "".join([website,param])  
>>> url  
'http://www.linuxac.org/?p=123'
```

# Python Lists

---

- Python lists are very useful when you have a collection of elements

```
>>> portList = [21,22,25,80]
```

```
>>> portList[0]
```

```
21
```

```
>>> portList.append(443)
```

```
>>> portList
```

```
[21, 22, 25, 80, 443]
```

```
>>> portList.remove(22)
```

```
>>> portList
```

```
[21, 25, 80, 443]
```

```
>>> portList.insert(1,22)
```

```
>>> portList
```

```
[21, 22, 25, 80, 443]
```

```
>>> portList = []
```

```
>>> portList
```

```
[]
```

Lists in Python can be of any mixed type, even list of variables!!!

# Python Controls - Decisions

---

- IF, ELSE, and ELIF Statements

```
>>> pList = [21,22,25,80]
>>> if pList[0] == 21:
...     print("FTP Service")
... elif pList[0] == 22:
...     print("SSH Service")
... else:
...     print("Unknown Service")
...
FTP
```

## Important NOTE:

- Python doesn't use line terminators (ex: semicolons), but Python forces you to use indents
  - Ensures writing elegant code!

# Python Controls - Loops

---

- For and While Statements

```
>>> for port in pList:  
...     print "This is port : ", port
```

...

This is port : 21

This is port : 22

This is port : 25

This is port : 80

# Python Tips and Tricks

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- Changing and checking data types

```
>>> httpPort=80
>>> httpPort
80
>>> type(httpPort)
<type 'int'>
>>> httpPort = str(httpPort)
>>> type(httpPort)
<type 'str'>
>>> httpPort
'80'
```

# Python Tips and Tricks – Cont.

---

- Getting the length of an object

```
>>> len(pList)
```

4

- String formatting

```
>>> pList = [21,22,25,80]
```

```
>>> for member in pList:
```

```
...     print "This is port number %d" % member
```

...

This is port number 21

This is port number 22

This is port number 25

This is port number 80

# Python Tips and Tricks – Cont.

---

- Another String formatting example

```
>>> ip = "192.168.1.1"  
>>> mac = "AA:BB:CC:DD:EE:FF"  
>>> print "The gateway has the following IP: %s and MAC: %s  
addresses" % (ip, mac)
```

The gateway has the following IP: 192.168.1.1 and MAC:  
AA:BB:CC:DD:EE:FF addresses

# Python Tips and Tricks – Cont.

---

- Working with ASCII codes

```
>>> x = '\x41'
```

```
>>> print x
```

A

- Converting to Hexadecimals

```
>>> hex(255)
```

'0xff'

```
>>> hex(0)
```

'0x0'

```
>>> hex(10)
```

'0xa'

```
>>> hex(15)
```

'0xf'

# Python User Input

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- Python can handle user input from different sources:
  - Directly from the user
  - From Text Files
  - From GUI (not covered in this training)

# Python User Input – Cont.

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- Directly from the user using raw\_input

```
>>> userEmail = raw_input("Please enter your email address: ")
```

Please enter your email address: binary@linuxac.org

```
>>> userEmail  
'binary@linuxac.org'
```

```
>>> type(userEmail)  
<type 'str'>
```

# Python User Input – Cont.

---

- From Text Files

```
>>> f = open("./services.txt", "r")
```

```
>>> for line in f:
```

```
...     print line
```

```
...
```

HTTP 80

SSH 22

FTP 21

HTTPS 443

SMTP 25

POP 110

```
>>> f.close()
```

Other common file functions:

- write
- read
- readline

# Creating Functions

---

- Whenever you need to repeat a block of code, functions comes helpful
- Creating a Python Function (syntax)

```
def fName( listOfArguments ):  
    Line1  
    Line2  
    ....  
    Line n  
    return something
```

# Creating Functions – Cont.

---

- Basic function to check for valid port numbers

```
def checkPortNumber(port):  
    if port > 65535 or port < 0:  
        return False  
    else:  
        return True
```

- Howto use the **checkPortNumber** function:

```
print checkPortNumber(80) → True
```

```
print checkPortNumber(66000) → False
```

```
print checkPortNumber(-1) → False
```

# Working with Modules

---

- Modules in Python are simply any file containing Python statements!
- Python is distributed with many modules
- To use a module:
  - import module
  - import module1, module2, moduleN
  - import module as newname
  - from module import \*
  - from module import <specific>

# Common Used Modules

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- The most commonly used modules with security coding are:
  - string, re
  - os, sys, socket
  - hashlib
  - httplib, urllib2
  - Others? Please add ...

# Modules and Examples

---

# Module “sys”

---

- Check Python path, and count them

```
import sys  
print "path has", len(sys.path), "members"  
print "The members are:"  
for member in sys.path:  
    print member
```

- Print all imported modules:

```
>>> print sys.modules.keys()
```

- Print the platform type (linux, win32, mac, etc)

```
>>> print sys.platform
```

# Module “sys” – Cont.

---

- Check application name, and list number of passed arguments

```
import sys  
print "The application name is:", sys.argv[0]  
  
if len(sys.argv) > 1:  
    print "You passed", len(sys.argv)-1, "arguments. They are:"  
    for arg in sys.argv[1:]:  
        print arg  
else:  
    print "No arguments passed!"
```

# Module “sys” – Cont.

---

- Check the Python working version

```
>>> sys.version
```

# Module “os”

---

```
import os
```

- Check platform name (UNIX/Linux = posix, Windows = nt):

```
>>> os.name
```

- Print the current working directory

```
>>> os.getcwd()
```

- List files in specific directory

```
fList = os.listdir("/home")
```

```
for f in fList:
```

```
    print f
```

# Module “os” – Cont.

---

- Remove a file (delete)

```
>>> os.remove("file.txt")
```

- Check the platform line terminator (Windows = ‘\r\n’ , Linux = ‘\n’ , Mac = ‘\r’ )

```
>>> os.linesep
```

- Get the effective UID for current user

```
>>> os.geteuid()
```

- Check if file and check if directory

```
>>> os.path.isfile("/tmp")
```

```
>>> os.path.isdir("/tmp")
```

# Module “os” – Cont.

---

- Run a shell command

```
>>> os.system("ping -c 2 127.0.0.1")
```

- Execute a command & return a file object

```
files = os.popen("ls -l /tmp")
```

```
for i in files:
```

```
    print i
```

# Module “os” – Cont.

---

```
os.system()      # Executing a shell command  
os.stat()        # Get the status of a file  
os.environ()     # Get the users environment  
os.chdir()       # Move focus to a different directory  
os.getcwd()      # Returns the current working directory  
os.getgid()       # Return the real group id of the current process  
os.getuid()       # Return the current process's user id  
os.getpid()      # Returns the real process ID of the current process  
os.getlogin()     # Return the name of the user logged  
os.access()       # Check read permissions  
os.chmod()        # Change the mode of path to the numeric mode  
os.chown()        # Change the owner and group id  
os.umask(mask)    # Set the current numeric umask  
os.getsize()      # Get the size of a file
```

# Module “os” – Cont.

---

```
os.path.getmtime()    # Last time a given directory was modified  
os.path.getatime()   # Last time a given directory was accessed  
os.environ()          # Get the users environment  
os.uname()            # Return information about the current OS  
os.chroot(path)      # Change the root directory of the current process  
                      to path  
  
os.listdir(path)      # List of the entries in the directory given by path  
os.getloadavg()       # Show queue averaged over the last 1, 5, and 15  
                      minutes  
  
os.path.exists()       # Check if a path exists  
os.walk()              # Print out all directories, sub-directories and files
```

# Module “os” – Cont.

---

os.mkdir(path)	# Create a directory named path with numeric mode mode
os.makedirs(path)	# Recursive directory creation function
os.remove(path)	# Remove (delete) the file path
os.removedirs(path)	# Remove directories recursively
os.rename(src, dst)	# Rename the file or directory src to dst
os.rmdir(path)	# Remove (delete) the directory path

# Module “socket”

---

```
import socket
```

- Creating a simple TCP client
  - Check simpleClient.py
- Creating a simple TCP server
  - Check simpleServer.py
- Create a malicious FTP Client
  - ftpClient.py

# Module “socket” – Cont.

---

- Create TCP Socket, then send and receive data from website using the socket

```
import socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.connect(("www.linuxac.org", 80))
s.send('GET / HTTP/1.1 \r\nHost: www.linuxac.org\r\n\r\n')
data = s.recv(2048)
s.close()
print data
```

**Note:** For UDP Sockets use SOCK\_DGRAM instead of SOCK\_STREAM

# Module “pcapy”

---

- Pcap is a Python extension module that interfaces with the libpcap packet capture library.
- Pcap enables python scripts to capture packets on the network.
- Pcap is highly effective when used in conjunction with a packet-handling package such as Impacket, which is a collection of Python classes for constructing and dissecting network packets.
- Packet Capturing using pcap example
  - pcapPktCapture1.py
  - pcapEx1.py
  - pcapDumper.py

# Module “urllib” & “urllib2”

---

- `urllib2` is a Python module for fetching URLs.
- Offers a very simple interface, in the form of the `urlopen` function.
- Capable of fetching URLs using a variety of different protocols (http, ftp, file, etc)
- Also offers a slightly more complex interface for handling common situations:
  - Basic authentication
  - Cookies
  - Proxies
  - etc

# urllib vs urllib2

---

- Both modules do URL request related stuff, but they have different functionality.
- urllib2 can accept a Request object to set the headers for a URL request, urllib accepts only a URL.
- urllib provides the urlencode method which is used for the generation of GET query strings, urllib2 doesn't have such a function.
- Because of that urllib and urllib2 are often used together.

# Example 1

---

```
import urllib2  
request = urllib2.Request('http://www.linuxac.org')  
response = urllib2.urlopen(request)  
payload = response.read()  
print(payload)
```

# Basic URL Request

---

```
import urllib2
response =
    urllib2.urlopen('http://pythonforbeginners.com/')
print response.info()
html = response.read()
response.close()
```

# Base64 & ROT13 Encoders

---

## Base64

```
#!/usr/bin/python
code = raw_input("Enter the data you wish to be encoded to
    Base64")
answer=code.encode('base64','strict')
print answer
```

## ROT13

```
#!/usr/bin/python
code = raw_input("Enter the data you wish to be encoded to
    Base64")
answer=code.encode('rot13','strict')
print answer
```

# Exploit Development

---

```
#!/usr/bin/python
import socket
host = "target"
port = <port#>
cmd = "initial command"
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
buffer = "buffer to send"
shellcode = "shellcode"
Payload = cmd + buffer + shellcode
print "\n Any status message \n"
s.connect((host,port))
data = s.recv(1024)
s.send(payload +"\n")
s.close
```

# Packet Crafting with Scapy

---

# Scapy Overview

---

- Scapy is a Python program that enables the user to send, sniff and dissect and forge network packets.
- This capability allows construction of tools that can probe, scan or attack networks.
- It can replace hping, arpspoof, arp-sk, arping, p0f and even some parts of Nmap, tcpdump, and tshark.

# Scapy Overview – Cont.

---

- Scapy was created by Philippe Biondi and runs in Python:
  - Can be used interactively at a Python prompt
  - Included within Python scripts for more complex interactions
- Must run with root privileges to craft packets,
- Don't need to be a Python Guru to use Scapy!

# Scapy Basics - 1

---

- Supported protocols:

```
>>> ls()
```

- Details about a specific protocol:

```
>>> ls(TCP)
```

- Available commands/functions:

```
>>> lsc()
```

# Scapy Basics - 2

---

- Crafting a SYN/ACK Packet

```
>>> pkt = IP(dst="192.168.122.101")
```

```
>>> pkt /= TCP(dport=80, flags="SA")
```

- Crafting ICMP Host Unreachable Packet

```
>>> pkt = IP(dst="192.168.122.101")
```

```
>>> pkt /= ICMP(type=3,code=1)
```

# Scapy Basics - 3

---

Single Line:

- ICMP echo request Packet

```
>>> mypkt = IP(dst="192.168.122.101")  
    /ICMP(code=0,type=8)
```

- TCP FIN, Port 22, Random Source Port, and Random Seq#

```
>>> mypkt = IP(dst="192.168.122.101")  
    /TCP(dport=22,sport=RandShort(),seq=RandShort()  
    ,flags="F")
```

# Sending and Receiving Packets

– *@L3*

---

- Send packet at layer 3

```
>>> send(packet)
```

- Send packet at L3 and receive one response

```
>>> resp = sr1(packet)
```

- Send packet at L3 and receive all responses

```
>>> ans,unans = sr(packet)
```

# Sending and Receiving Packets

## - @L2

---

- Send packet at layer 2

```
>>> sendp(Ether()/packet)
```

- Send packet at L2 and receive one response

```
>>> resp = srp1(packet)
```

- Send packet at L2 and receive all responses

```
>>> ans,unans = srp(packet)
```

# Displaying Packets

---

- Get a summary of each packet:

```
>>> pkts.summary()
```

- Get the whole packet list:

```
>>> pkts.show()
```

# Scapy Host Discovery

---

```
>>> ans,unans =  
srp(Ether(dst="ff:ff:ff:ff:ff:ff")/ARP(pdst="192.168.1  
22.0/24"),timeout=2)
```

```
>>> ans.summary(lambda(s,r): r.sprintf("Ether:  
%Ether.src% \t\t Host: %ARP.psrc%"))
```

# Scapy Port Scanning

---

- TCP SYN Scanner

```
>>> sr1(IP(dst="192.168.122.101")  
/TCP(dport=90,flags="S"))
```

```
>>> a,u = sr(IP(dst="192.168.122.101")  
/TCP(dport=(80,100),flags="S"))
```

```
>>> a.summary(lambda(s,r): r.sprintf("Port:  
%TCP.sport% \t\t Flags: %TCP.flags%"))
```

# Scapy Sniffing - 1

---

- Scapy has powerful capabilities to capture and analyze packets.
- Configure the network interface to sniff packets from:

```
>>> conf.iface="eth0"
```

Configure the scapy sniffer to sniff only 20 packets

```
>>> pkts=sniff(count=20)
```

# Scapy Sniffing - 2

---

- Sniff packets and stop after a defined time:

```
>>> pkts=sniff(count=100,timeout=60)
```

- Sniff only packets based on a filter:

```
>>> pkts = sniff(count=100,filter="tcp port 80")
```

# Scapy Sniffing - 3

---

```
>>> pkts = sniff(count=10,prn=lambda  
x:x.sprintf("SrcIP=%IP.src% ->  
DestIP=%IP.dst%} |  
Payload={Raw:%Raw.load%\n}))
```

- What is that doing ???

# Exporting Packets

---

- Sometimes it is very useful to save the captured packets in a PCAP file for future work:

```
>>> wrpcap("file1.cap", pkts)
```

- Dumping packets in HEX format:

```
>>> hexdump(pkts)
```

- Dump a single packet in HEX format:

```
>>> hexdump(pkts[2])
```

- Convert a packet to hex string:

```
>>> str(pkts[2])
```

- Exporting to Base64 encoded packets:

```
>>> export_object(pkts)
```

# Importing Packets

---

- To import from a PCAP file:

```
>>> pkts = rdpcap("file1.cap")
```

- Or use the scapy sniffer but with the offline argument:

```
>>> pkts2 = sniff(offline="file1.cap")
```

# Create your own tools

---

```
>>> def handler(packet):
        hexdump(packet.payload)
>>> sniff(count=20, prn=handler)

>>> def handler2(packet):
        sendp(packet)
>>> sniff(count=20, prn=handler2)
```

# **Python Tools for Penetration Testers**

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# Network Tools

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- [Scapy](#): send, sniff and dissect and forge network packets. Usable interactively or as a library
- [pypcap](#), [Pcap](#) and [pylibpcap](#): several different Python bindings for libpcap
- [libdnet](#): low-level networking routines, including interface lookup and Ethernet frame transmission
- [dpkt](#): fast, simple packet creation/parsing, with definitions for the basic TCP/IP protocols
- [Impacket](#): craft and decode network packets. Includes support for higher-level protocols such as NMB and SMB
- [pynids](#): libnids wrapper offering sniffing, IP defragmentation, TCP stream reassembly and port scan detection
- [Dirtbags py-pcap](#): read pcap files without libpcap
- [flowgrep](#): grep through packet payloads using regular expressions
- [Knock Subdomain Scan](#), enumerate subdomains on a target domain through a wordlist
- [Mallory](#), extensible TCP/UDP man-in-the-middle proxy, supports modifying non-standard protocols on the fly
- [Pytbull](#): flexible IDS/IPS testing framework (shipped with more than 300 tests)

# Debugging and Reverse Engineering Tools

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- [Paimei](#): reverse engineering framework, includes [PyDBG](#), PIDA, pGRAPH
- [Immunity Debugger](#): scriptable GUI and command line debugger
- [mona.py](#): PyCommand for Immunity Debugger that replaces and improves on pvefindaddr
- [IDAPython](#): IDA Pro plugin that integrates the Python programming language, allowing scripts to run in IDA Pro
- [PyEMU](#): fully scriptable IA-32 emulator, useful for malware analysis
- [pefile](#): read and work with Portable Executable (aka PE) files
- [pydasm](#): Python interface to the [libdasm](#) x86 disassembling library
- [PyDbgEng](#): Python wrapper for the Microsoft Windows Debugging Engine
- [uhooker](#): intercept calls to API calls inside DLLs, and also arbitrary addresses within the executable file in memory
- [diStorm](#): disassembler library for AMD64, licensed under the BSD license
- [python-ptrace](#): debugger using ptrace (Linux, BSD and Darwin system call to trace processes) written in Python
- [vdb / vtrace](#): vtrace is a cross-platform process debugging API implemented in python, and vdb is a debugger which uses it
- [Androguard](#): reverse engineering and analysis of Android applications

# Fuzzing Tools

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- [Sulley](#): fuzzer development and fuzz testing framework consisting of multiple extensible components
- [Peach Fuzzing Platform](#): extensible fuzzing framework for generation and mutation based fuzzing (v2 was written in Python)
- [antiparser](#): fuzz testing and fault injection API
- [TAOF](#), (The Art of Fuzzing) including ProxyFuzz, a man-in-the-middle non-deterministic network fuzzer
- [untidy](#): general purpose XML fuzzer
- [Powerfuzzer](#): highly automated and fully customizable web fuzzer (HTTP protocol based application fuzzer)
- [SMUDGE](#)
- [Mistress](#): probe file formats on the fly and protocols with malformed data, based on pre-defined patterns
- [Fuzzbox](#): multi-codec media fuzzer
- [Forensic Fuzzing Tools](#): generate fuzzed files, fuzzed file systems, and file systems containing fuzzed files in order to test the robustness of forensics tools and examination systems
- [Windows IPC Fuzzing Tools](#): tools used to fuzz applications that use Windows Interprocess Communication mechanisms
- [WSBang](#): perform automated security testing of SOAP based web services
- [Construct](#): library for parsing and building of data structures (binary or textual). Define your data structures in a declarative manner
- [fuzzer.py \(feliam\)](#): simple fuzzer by Felipe Andres Manzano
- [Fusil](#): Python library used to write fuzzing programs

# Web Tools

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- Requests: elegant and simple HTTP library, built for human beings
- HTTPie: human-friendly cURL-like command line HTTP client
- ProxMon: processes proxy logs and reports discovered issues
- WSMap: find web service endpoints and discovery files
- Twill: browse the Web from a command-line interface. Supports automated Web testing
- Ghost.py: webkit web client written in Python
- Windmill: web testing tool designed to let you painlessly automate and debug your web application
- FunkLoad: functional and load web tester
- spynner: Programmatic web browsing module for Python with Javascript/AJAX support
- python-spidermonkey: bridge to the Mozilla SpiderMonkey JavaScript engine; allows for the evaluation and calling of Javascript scripts and functions
- mitmproxy: SSL-capable, intercepting HTTP proxy. Console interface allows traffic flows to be inspected and edited on the fly
- pathod / pathoc: pathological daemon/client for tormenting HTTP clients and servers

# Forensic Tools

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- Volatility: extract digital artifacts from volatile memory (RAM) samples
- LibForensics: library for developing digital forensics applications
- TrIDLib, identify file types from their binary signatures. Now includes Python binding
- aft: Android forensic toolkit

# Malware Analysis Tools

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- pyew: command line hexadecimal editor and disassembler, mainly to analyze malware
- Exefilter: filter file formats in e-mails, web pages or files. Detects many common file formats and can remove active content
- pyClamAV: add virus detection capabilities to your Python software
- jsunpack-n, generic JavaScript unpacker: emulates browser functionality to detect exploits that target browser and browser plug-in vulnerabilities
- yara-python: identify and classify malware samples
- phoneyc: pure Python honeyclient implementation

# PDF Tools

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- [Didier Stevens' PDF tools](#): analyse, identify and create PDF files (includes [PDFiD](#), [pdf-parser](#) and [make-pdf](#) and mPDF)
- [Opdf](#): Open PDF Analysis Framework. Converts PDF to an XML tree that can be analyzed and modified.
- [Origapy](#): Python wrapper for the Origami Ruby module which sanitizes PDF files
- [pyPDF](#): pure Python PDF toolkit: extract info, split, merge, crop, encrypt, decrypt...
- [PDFMiner](#): extract text from PDF files
- [python-poppler-qt4](#): Python binding for the Poppler PDF library, including Qt4 support

# Lab Time!

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# DIY 😊

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This lab is a Do It Yourself (DIY) Lab that must be done at home:

- [1] Create a TCP ACK Port Scanner
- [2] Create a TCP Replay Tool
- [3] Create a UDP Ping Tool
- [4] Create a Sniffer that filters based on user input
- [5] Create a tool for HTTP Basic Authentication over
- [6] Create a basic Honeypot that logs all activity to a text file

# SUMMARY

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- Discussed Why Learn Python
- Discussed What is Python Good for?
- Explained Python Basics:
  - Integers, Floating point, etc
  - Strings,
  - Lists,
  - Controls,
  - etc
- Some Quick Python Tips and Tricks
- Python User Input
- Howto Create Functions using Python
- Working with Modules, and the Python Common Used Modules

# SUMMARY – Cont.

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- Howto use the Python SYS and OS Modules
- Using Python to work with Networks: Sockets, pcap, etc
- Using Python to work with the Web (urllib, urllib2)
- Using Python to create simple Encoders
- Howto use Python for Exploit Development
- Craft your own packets using Scapy
- Python tools for penetration testers
- DIY Labs

# Works Cited

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