Last updated 9/24/2016

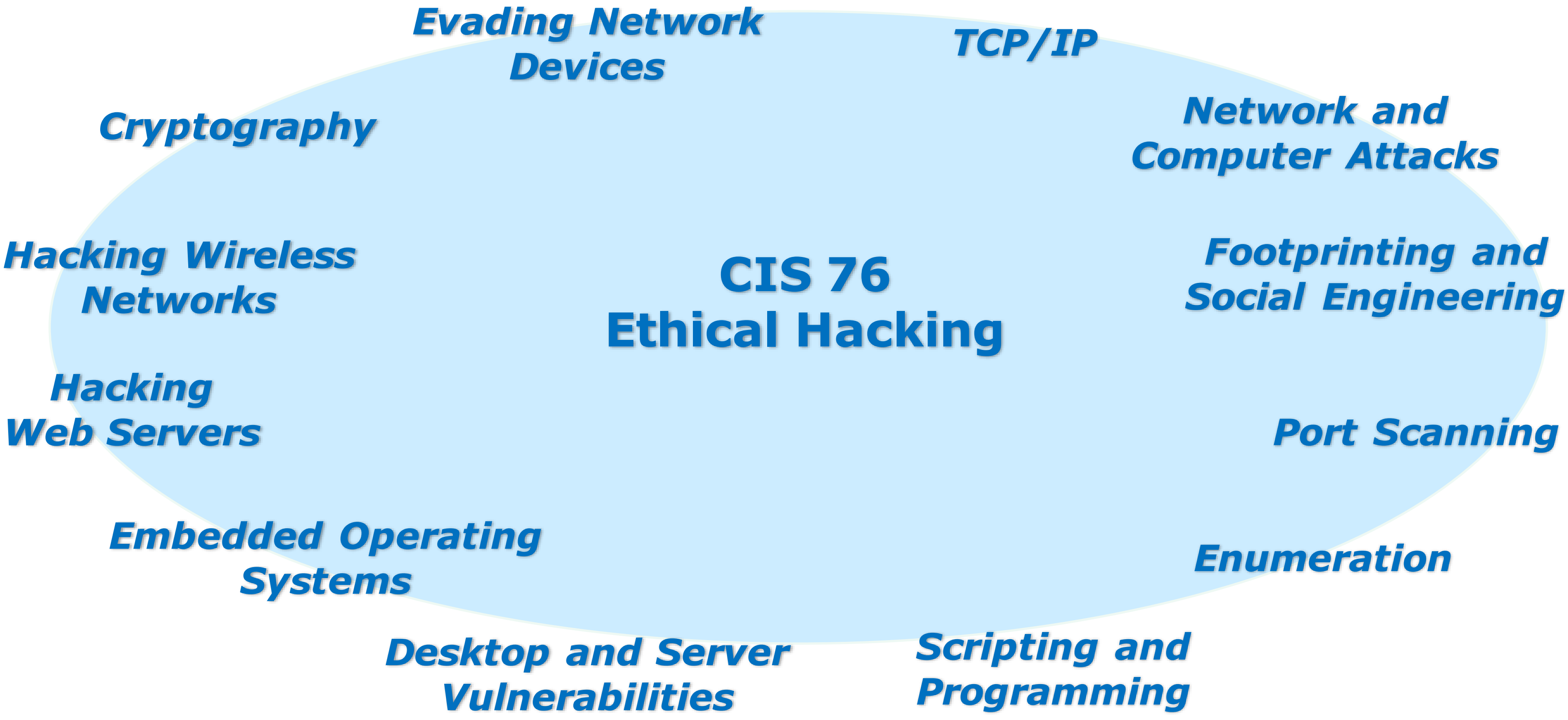
Rich's lesson module checklist

- □ Slides and lab posted
- □ WB converted from PowerPoint
- □ Print out agenda slide and annotate page numbers

- □ Flash cards
- □ Properties
- □ Page numbers
- □ 1st minute quiz
- □ Web Calendar summary
- □ Web book pages
- □ Commands

- □ Practice test on Canvase

- □ Backup slides, whiteboard slides, CCC info, handouts on flash drive
- □ Spare 9v battery for mic
- □ Key card for classroom door



CIS 76 Ethical Hacking

Evading Network Devices

TCP/IP

Network and Computer Attacks

Footprinting and Social Engineering

Port Scanning

Enumeration

Scripting and Programming

Desktop and Server Vulnerabilities

Embedded Operating Systems

Hacking Web Servers

Hacking Wireless Networks

Cryptography

Student Learner Outcomes

1. Defend a computer and a LAN against a variety of different types of security attacks using a number of hands-on techniques.

2. Defend a computer and a LAN against a variety of different types of security attacks using a number of hands-on techniques.

Introductions and Credits

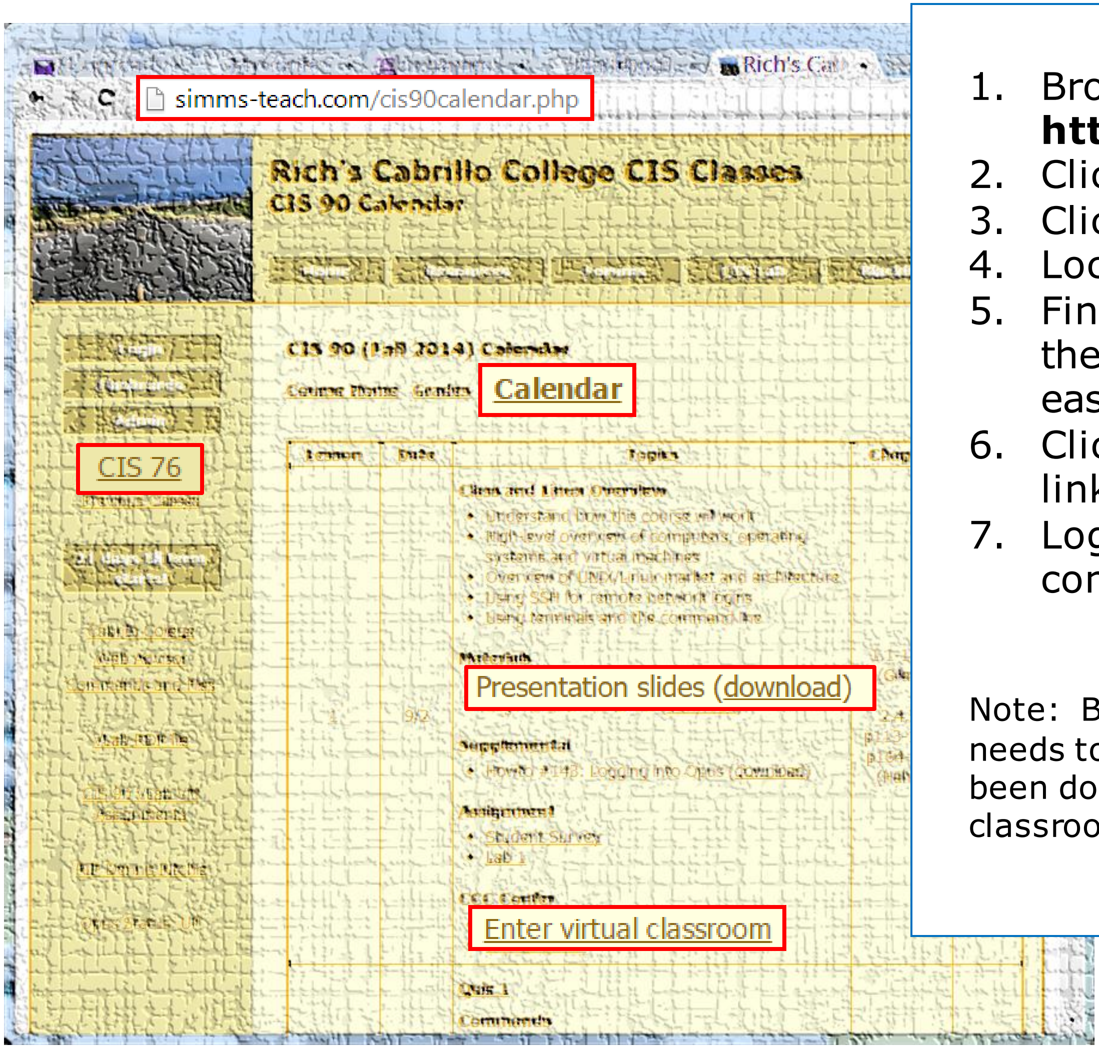
Rich Simms

- HP Alumnus.
- Started teaching in 2008 when Jim Griffin went on sabbatical.
- Rich’s site: http://simms-teach.com

And thanks to:

- Steven Bolt at for his WASTC EH training.
- Kevin Vaccaro for his CSSIA EH training and Netlab+ pods.
- EC-Council for their online self-paced CEH v9 course.
- Sam Bowne for his WASTC seminars, textbook recommendation and fantastic EH website (https://samsclass.info/).
- Lisa Bock for her great lynda.com EH course.
- John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system (http://teacherjohn.com/).
- Google for everything else!

Student checklist for attending class

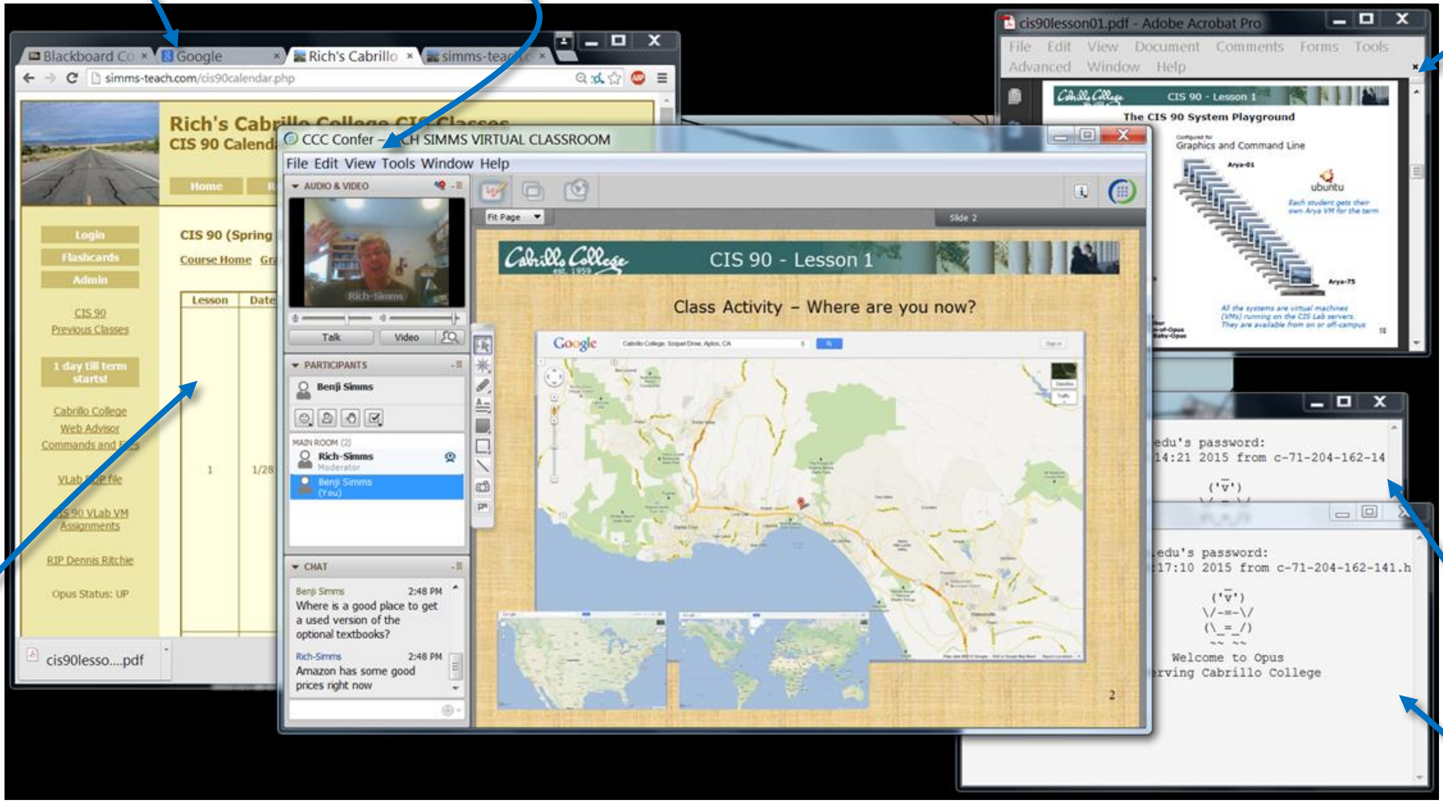

simms-teach.com/cis90calendar.php
Rich's Cabrillo College CIS Classes
CIS 90 Calendar
Calendar
CIS 76
Presentation slides (download)
Enter virtual classroom

1. Browse to: **http://simms-teach.com**
2. Click the **CIS 76** link.
3. Click the **Calendar** link.
4. Locate today's lesson.
5. Find the **Presentation slides** for the lesson and **download** for easier viewing.
6. Click the **Enter virtual classroom** link to join CCC Confer.
7. Log into Opus with Putty or ssh command.

Note: Blackboard Collaborate Launcher only needs to be installed once. It has already been downloaded and installed on the classroom PC's.

Student checklist for suggested screen layout

- ❑ Google
- ❑ CCC Confer
- ❑ Downloaded PDF of Lesson Slides


Blackboard Co
Google
Rich's Cabrillo
simms-teach
simms-teach.com/cis90calendar.php
Rich's Cabrillo College CIS Classes
CIS 90 Calendar
Home
Login
Flashcards
Admin
CIS 90
Previous Classes
1 day till term starts!
Cabrillo College
Web Advisor
Commands and Files
VLab RDP file
CIS 90 VLab VM Assignments
RIP Dennis Ritchie
Opus Status: UP
CIS 90 (Spring
Course Home
Lesson
Date
1
1/28
cis90lesso....pdf
CCC Confer – RICH SIMMS VIRTUAL CLASSROOM
File Edit View Tools Window Help
AUDIO & VIDEO
Rich-Simms
Talk
Video
PARTICIPANTS
Benji Simms
MAIN ROOM (2)
Rich-Simms
Moderator
Benji Simms
(You)
CHAT
Fit Page
Slide 2
Cabrillo College
CIS 90 - Lesson 1
Class Activity – Where are you now?
Google
2
cis90lesson01.pdf - Adobe Acrobat Pro
File Edit View Document Comments Forms Tools Advanced Window Help
CIS 90 - Lesson 1
The CIS 90 System Playground
Graphics and Command Line
Arya-01
ubuntu
Each student gets their own Arya VM for the term
Arya-75
All the systems are virtual machines (VMs) running on the CIS Lab servers. They are available from on or off-campus

Benji Simms 2:48 PM
Where is a good place to get a used version of the optional textbooks?

Rich-Simms 2:48 PM
Amazon has some good prices right now

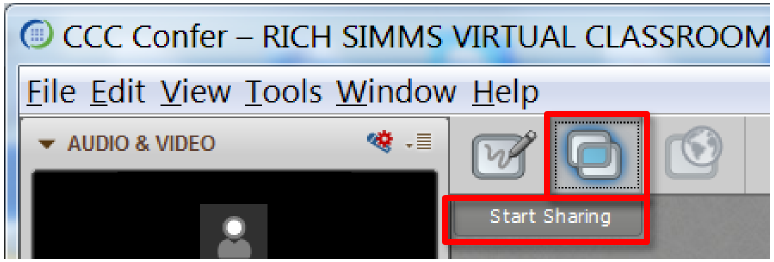
```
edu's password:
14:21 2015 from c-71-204-162-14

          ('v')
```

```
edu's password:
17:10 2015 from c-71-204-162-141.h

          ('v')
         \/-=-\/
         (\_=_/)
          ~~ ~~
     Welcome to Opus
 rving Cabrillo College
```

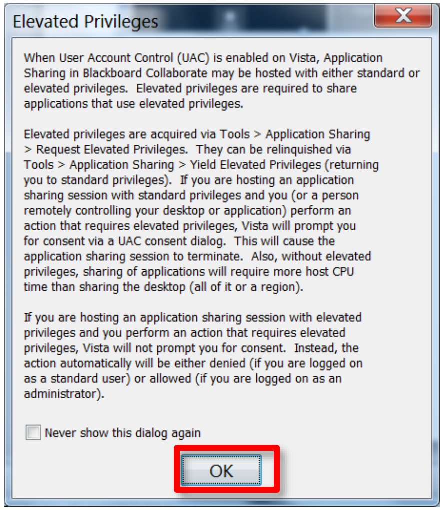
- ❑ CIS 76 website Calendar page
- ❑ One or more login sessions to Opus

Student checklist for sharing desktop with classmates

1) Instructor gives you sharing privileges.


CCC Confer – RICH SIMMS VIRTUAL CLASSROOM
File Edit View Tools Window Help
AUDIO & VIDEO
Start Sharing

2) Click overlapping rectangles icon. If white "Start Sharing" text is present then click it as well.



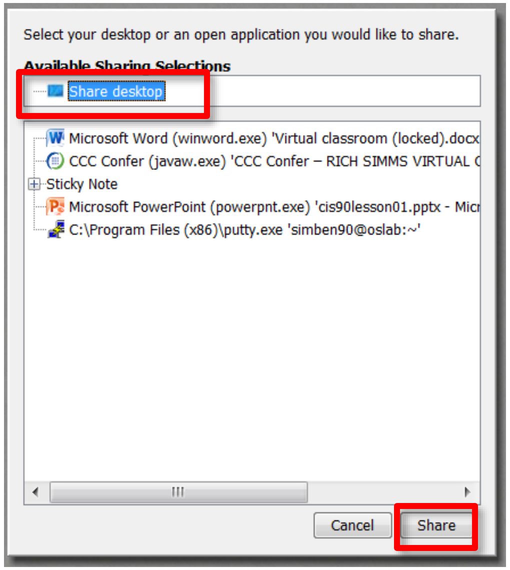
When User Account Control (UAC) is enabled on Vista, Application Sharing in Blackboard Collaborate may be hosted with either standard or elevated privileges. Elevated privileges are required to share applications that use elevated privileges.

Elevated privileges are acquired via Tools > Application Sharing > Request Elevated Privileges. They can be relinquished via Tools > Application Sharing > Yield Elevated Privileges (returning you to standard privileges). If you are hosting an application sharing session with standard privileges and you (or a person remotely controlling your desktop or application) perform an action that requires elevated privileges, Vista will prompt you for consent via a UAC consent dialog. This will cause the application sharing session to terminate. Also, without elevated privileges, sharing of applications will require more host CPU time than sharing the desktop (all of it or a region).

If you are hosting an application sharing session with elevated privileges and you perform an action that requires elevated privileges, Vista will not prompt you for consent. Instead, the action automatically will be either denied (if you are logged on as a standard user) or allowed (if you are logged on as an administrator).

☐ Never show this dialog again

3) Click OK button.



Select your desktop or an open application you would like to share.

Available Sharing Selections

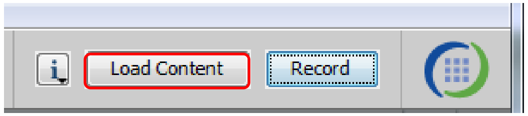
Share desktop

Microsoft Word (winword.exe) 'Virtual classroom (locked).docx
CCC Confer (javaw.exe) 'CCC Confer – RICH SIMMS VIRTUAL C
Sticky Note
Microsoft PowerPoint (powerpnt.exe) 'cis90lesson01.pptx - Micr
C:\Program Files (x86)\putty.exe 'simben90@oslab:~'

4) Select "Share desktop" and click Share button.

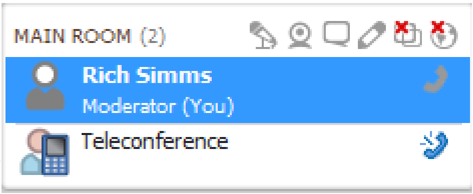
Rich's CCC Confer checklist - setup

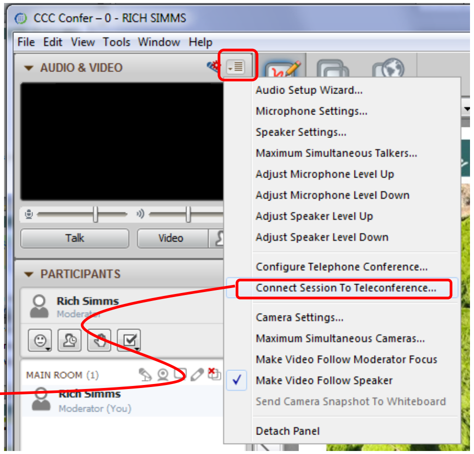
[ ] Preload White Board



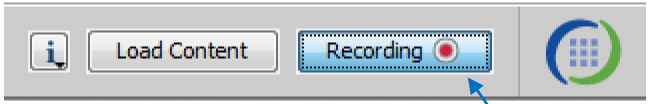
[ ] Connect session to Teleconference

Session now connected to teleconference




CCC Confer – 0 - RICH SIMMS
File Edit View Tools Window Help
AUDIO & VIDEO
Talk
Video
PARTICIPANTS
Rich Simms
Moderator
MAIN ROOM (1)
Rich Simms
Moderator (You)
Audio Setup Wizard...
Microphone Settings...
Speaker Settings...
Maximum Simultaneous Talkers...
Adjust Microphone Level Up
Adjust Microphone Level Down
Adjust Speaker Level Up
Adjust Speaker Level Down
Configure Telephone Conference...
Connect Session To Teleconference...
Camera Settings...
Maximum Simultaneous Cameras...
Make Video Follow Moderator Focus
✓ Make Video Follow Speaker
Send Camera Snapshot To Whiteboard
Detach Panel

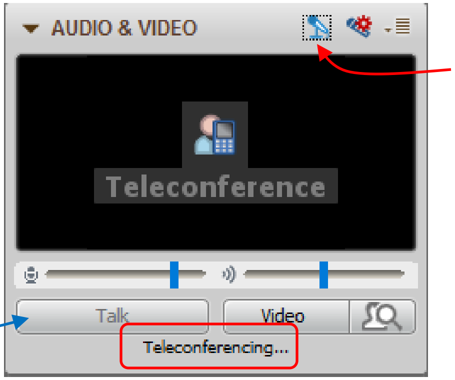
[ ] Is recording on?



Red dot means recording

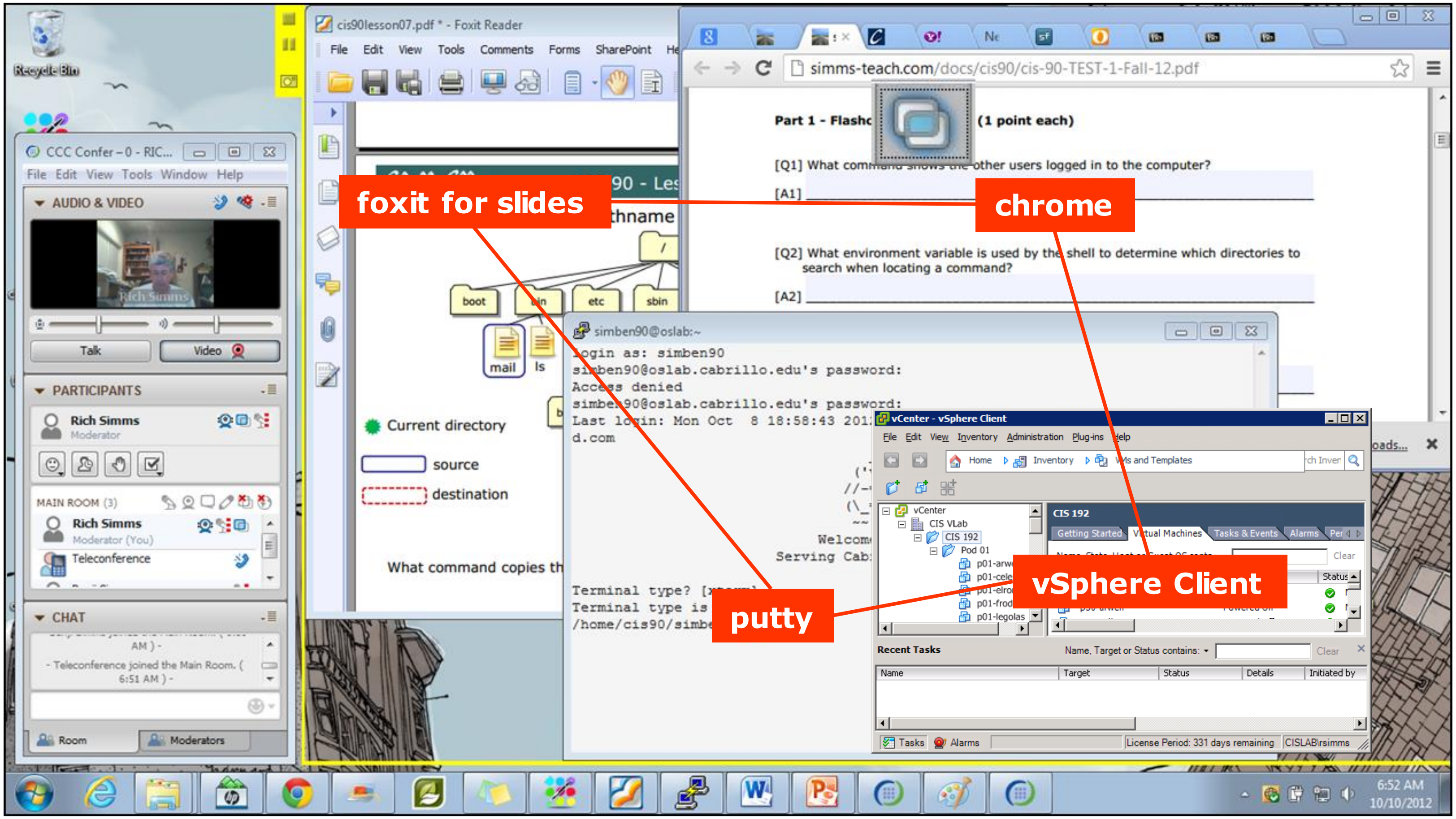
[ ] Use teleconferencing, not mic

Should be grayed out



Should change from phone handset icon to little Microphone icon and the Teleconferencing ... message displayed

Rich's CCC Confer checklist - screen layout



simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf

Part 1 - Flashc **(1 point each)**

[Q1] What command shows the other users logged in to the computer?

[A1] ______________________________

[Q2] What environment variable is used by the shell to determine which directories to search when locating a command?

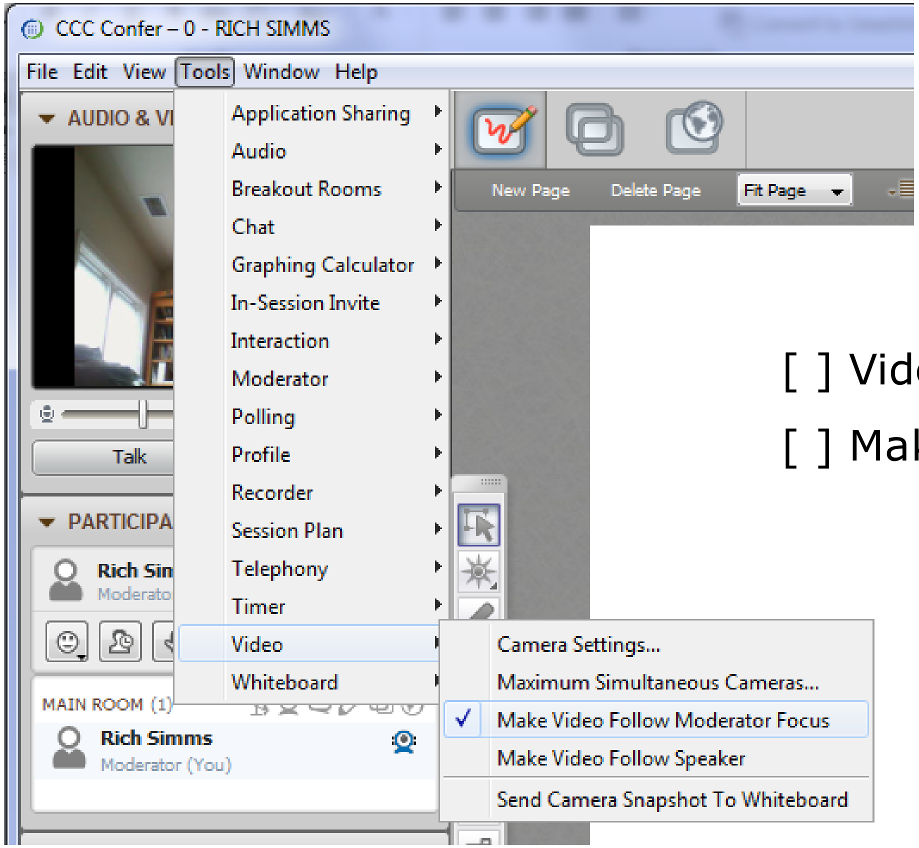
[A2] ______________________________

simben90@oslab:~

```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Access denied
simben90@oslab.cabrillo.edu's password:
Last login: Mon Oct  8 18:58:43 201
d.com

                                   Welcom
                             Serving Cab

Terminal type? [x
Terminal type is
/home/cis90/simbe
```

[ ] layout and share apps

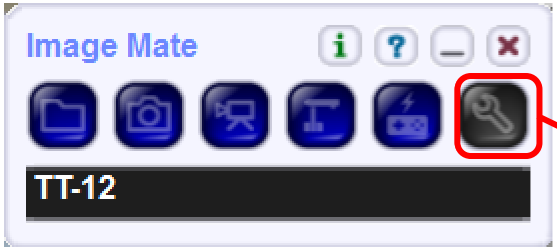
Rich's CCC Confer checklist - webcam setup

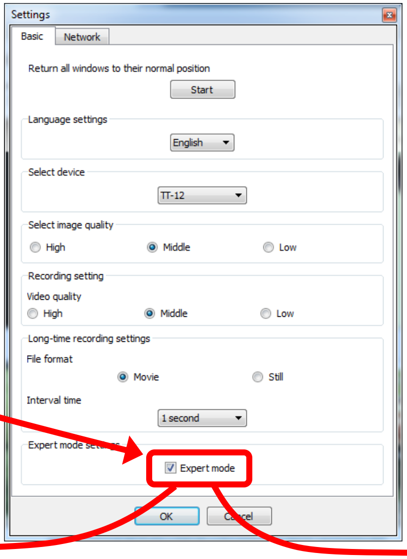


[ ] Video (webcam)

[ ] Make Video Follow Moderator Focus

Rich's CCC Confer checklist - Elmo




Settings

Basic | Network

Return all windows to their normal position

Start

Language settings: English

Select device: TT-12

Select image quality: ○ High ● Middle ○ Low

Recording setting

Video quality: ○ High ● Middle ○ Low

Long-time recording settings

File format: ● Movie ○ Still

Interval time: 1 second

Expert mode settings

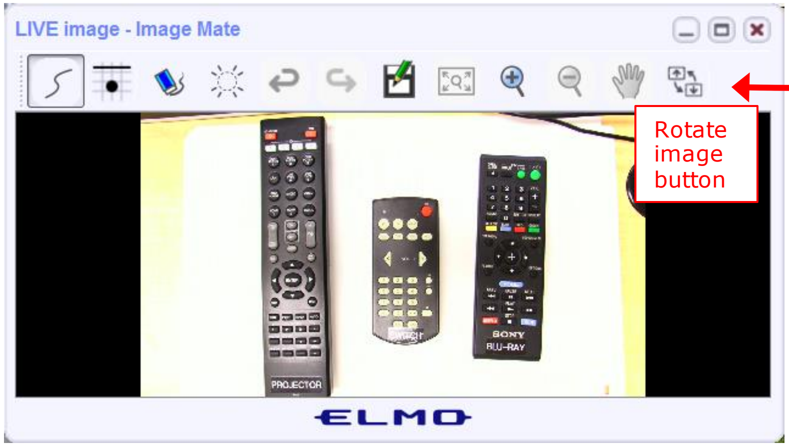
☑ Expert mode

OK | Cancel

The "rotate image" button is necessary if you use both the side table and the white board.

Quite interesting that they consider you to be an "expert" in order to use this button!

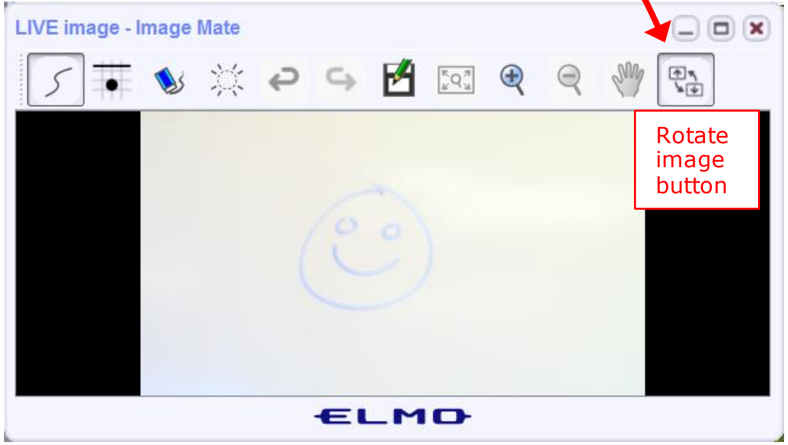
Elmo rotated down to view side table



Rotate image button

Run and share the Image Mate program just as you would any other app with CCC Confer

Elmo rotated up to view white board



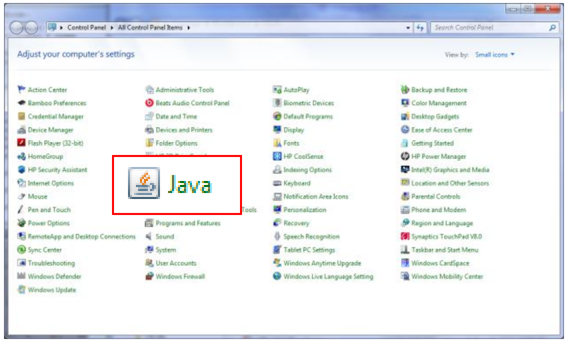
Rotate image button

Rich's CCC Confer checklist - universal fixes

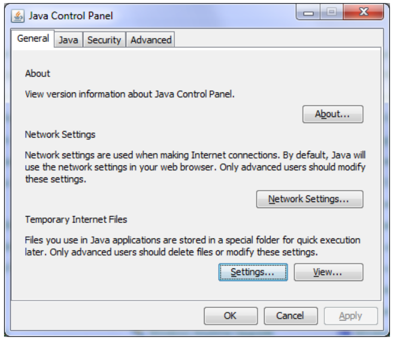
Universal Fix for CCC Confer:

1) Shrink (500 MB) and delete Java cache
2) Uninstall and reinstall latest Java runtime
3) http://www.cccconfer.org/support/technicalSupport.aspx

Control Panel (small icons)



General Tab > Settings...



About

View version information about Java Control Panel.

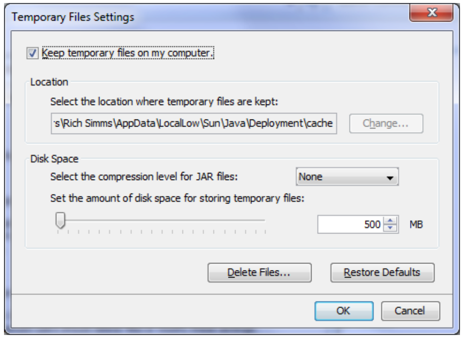
Network Settings

Network settings are used when making Internet connections. By default, Java will use the network settings in your web browser. Only advanced users should modify these settings.

Temporary Internet Files

Files you use in Java applications are stored in a special folder for quick execution later. Only advanced users should delete files or modify these settings.

500MB cache size



☑ Keep temporary files on my computer.

Location

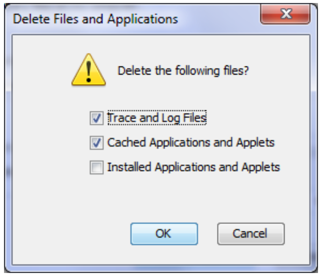
Select the location where temporary files are kept: 's\Rich Simms\AppData\LocalLow\Sun\Java\Deployment\cache

Disk Space

Select the compression level for JAR files: None

Set the amount of disk space for storing temporary files: 500 MB

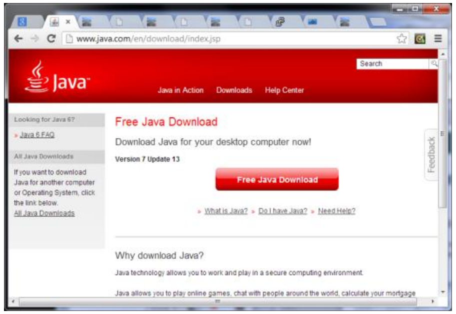
Delete these



Delete the following files?

☑ Trace and Log Files
☑ Cached Applications and Applets
□ Installed Applications and Applets

Google Java download



Free Java Download

Download Java for your desktop computer now!

Version 7 Update 13

If you want to download Java for another computer or Operating System, click the link below.

Why download Java?

Java technology allows you to work and play in a secure computing environment.

Java allows you to play online games, chat with people around the world, calculate your mortgage

Start

Sound Check

*Students that dial-in should mute their line using *6 to prevent unintended noises distracting the web conference.*

*Instructor can use *96 to mute all student lines.*

CIS 76 - Lesson 5

Instructor: **Rich Simms**
Dial-in: **888-886-3951**
Passcode: **136690**

Ryan

Jordan

Takashi

Karl-Heinz

Sean

Benji

Joshua

Brian

Tess

Jeremy

David H.

Roberto

Nelli

Mike C.

Deryck

Alex

Michael W.

Carter

Thomas

Wes

Jennifer

Marcos

Tim

Luis

Dave R.

Email me (risimms@cabrillo.edu) a relatively current photo of your face for 3 points extra credit

First Minute Quiz

Please answer these questions **in the order** shown:

Use CCC Confer White Board

email answers to: `risimms@cabrillo.edu`

(answers must be emailed within the first few minutes of class for credit)

Review and Gaps

Objectives

- Learn how to monitor TCP connections
- Get baseline on EC-Council mini assessment
- Hide a secret file using steganography
- Review material from the NISGTC EH course

Agenda

- Quiz #4
- Questions
- netstat and ss (ncat example)
- In the news
- Best practices
- EC-Council mini assessment 1-10
- Housekeeping
- EC-Council mini assessment 11-20
- Red/blue pods
- EC-Council mini assessment 21-30
- NISGTC - Domain 1
- Steganography
- EC-Council mini assessment 31-40
- NISGTC - Domain 2
- More recon websites
- EC-Council mini assessment 41-50
- NISGTC - Domain 7
- NISGTC - Domain 8
- Assignment
- Wrap up

Admonition

Unauthorized hacking is a crime.

The hacking methods and activities learned in this course can result in prison terms, large fines and lawsuits if used in an unethical manner. They may only be used in a lawful manner on equipment you own or where you have explicit permission from the owner.

Students that engage in any unethical, unauthorized or illegal hacking may be dropped from the course and will receive no legal protection or help from the instructor or the college.

Questions

Questions

How this course works?

Past lesson material?

Previous labs?

Chinese Proverb	他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。 *He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.*

Monitoring connections

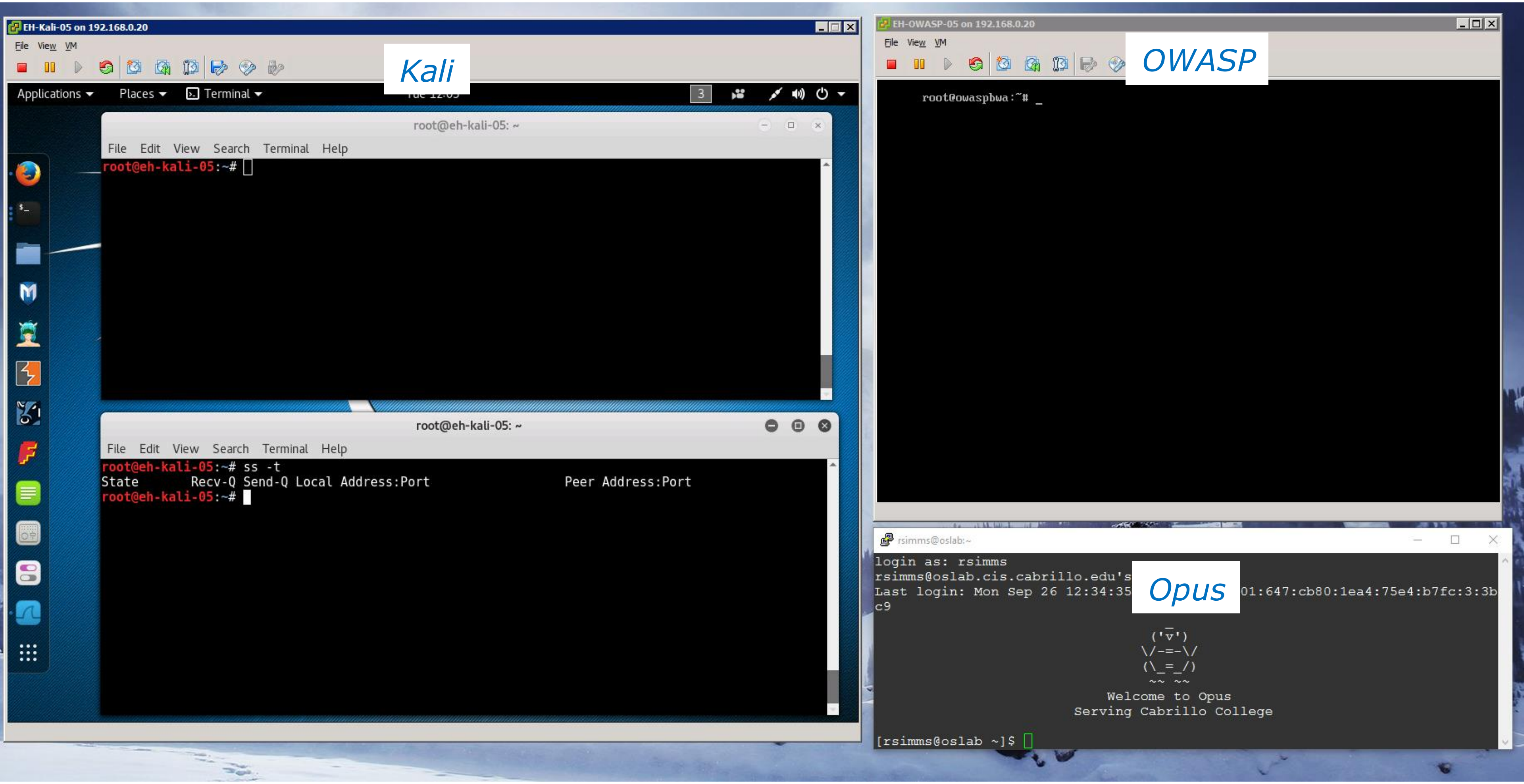
netstat and ss

Monitoring TCP Connections

```
netstat -tnlp

ss -tnlp
```

t = tcp
n = numeric values
l = listening
p = process (must be root)

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Kali
Applications Places Terminal
root@eh-kali-05: ~
File Edit View Search Terminal Help
EH-OWASP-05 on 192.168.0.20
OWASP
rsimms@oslab:~
Opus

```
root@eh-kali-05:~#
```

```
root@eh-kali-05:~# ss -t
State       Recv-Q Send-Q Local Address:Port                    Peer Address:Port
root@eh-kali-05:~#
```

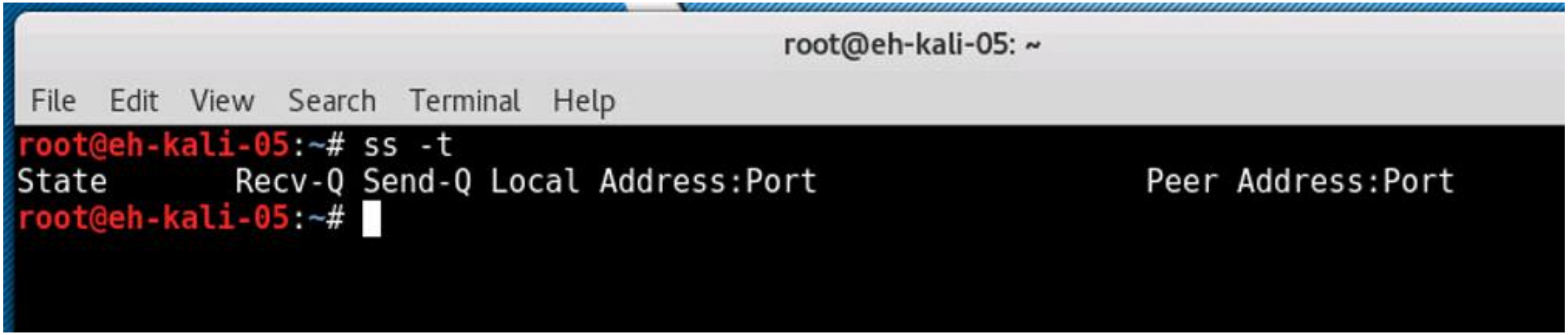
```
root@owaspbwa:~# _
```

```
login as: rsimms
rsimms@oslab.cis.cabrillo.edu's
Last login: Mon Sep 26 12:34:35          01:647:cb80:1ea4:75e4:b7fc:3:3b
c9

                              ('v')
                             \/-=-\/
                             (\_=_/)
                              ~~ ~~
                         Welcome to Opus
                     Serving Cabrillo College

[rsimms@oslab ~]$
```

ss -t

No tcp connections right now

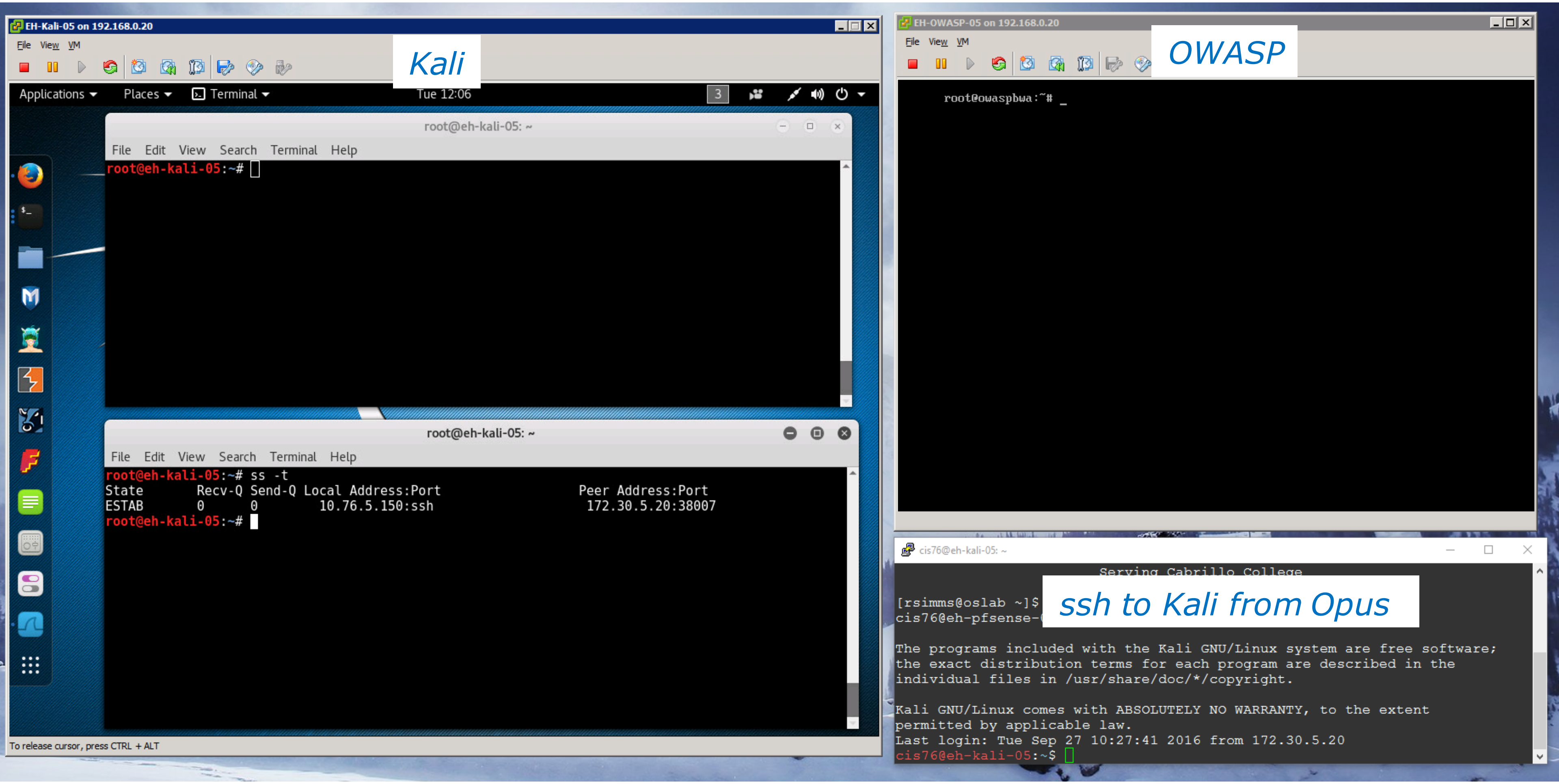
Monitoring TCP Connections



```
root@eh-kali-05:~# ss -t
State       Recv-Q Send-Q Local Address:Port                  Peer Address:Port
root@eh-kali-05:~# 
```

No tcp connections right now

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Terminal
Tue 12:06
root@eh-kali-05: ~
File Edit View Search Terminal Help
To release cursor, press CTRL + ALT
EH-OWASP-05 on 192.168.0.20
cis76@eh-kali-05: ~

Kali

```
root@eh-kali-05:~#
```

```
root@eh-kali-05:~# ss -t
State       Recv-Q Send-Q Local Address:Port                 Peer Address:Port
ESTAB       0      0         10.76.5.150:ssh                  172.30.5.20:38007
root@eh-kali-05:~#
```

OWASP

```
root@owaspbwa:~# _
```

ssh to Kali from Opus

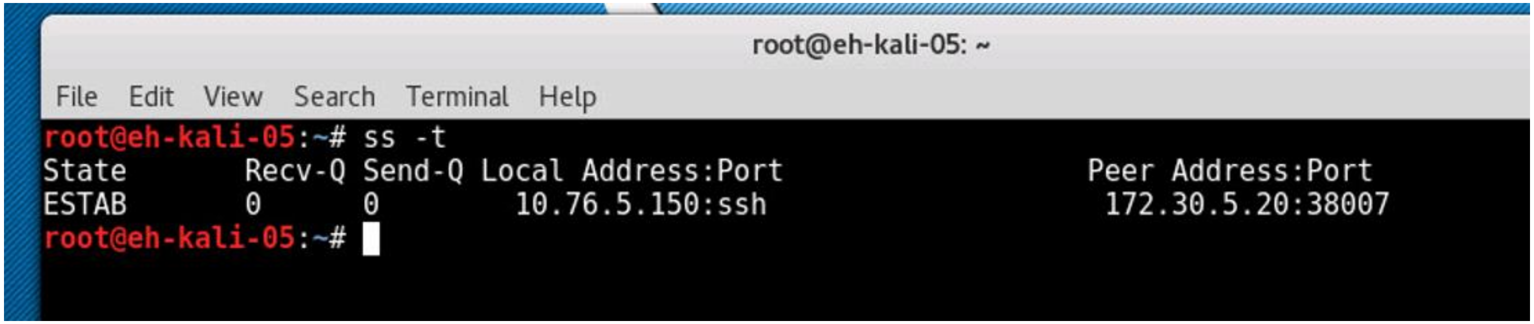
```
                         Serving Cabrillo College

[rsimms@oslab ~]$
cis76@eh-pfsense-(

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```

ss -t

On Kali we can see the connection to Opus

Monitoring TCP Connections

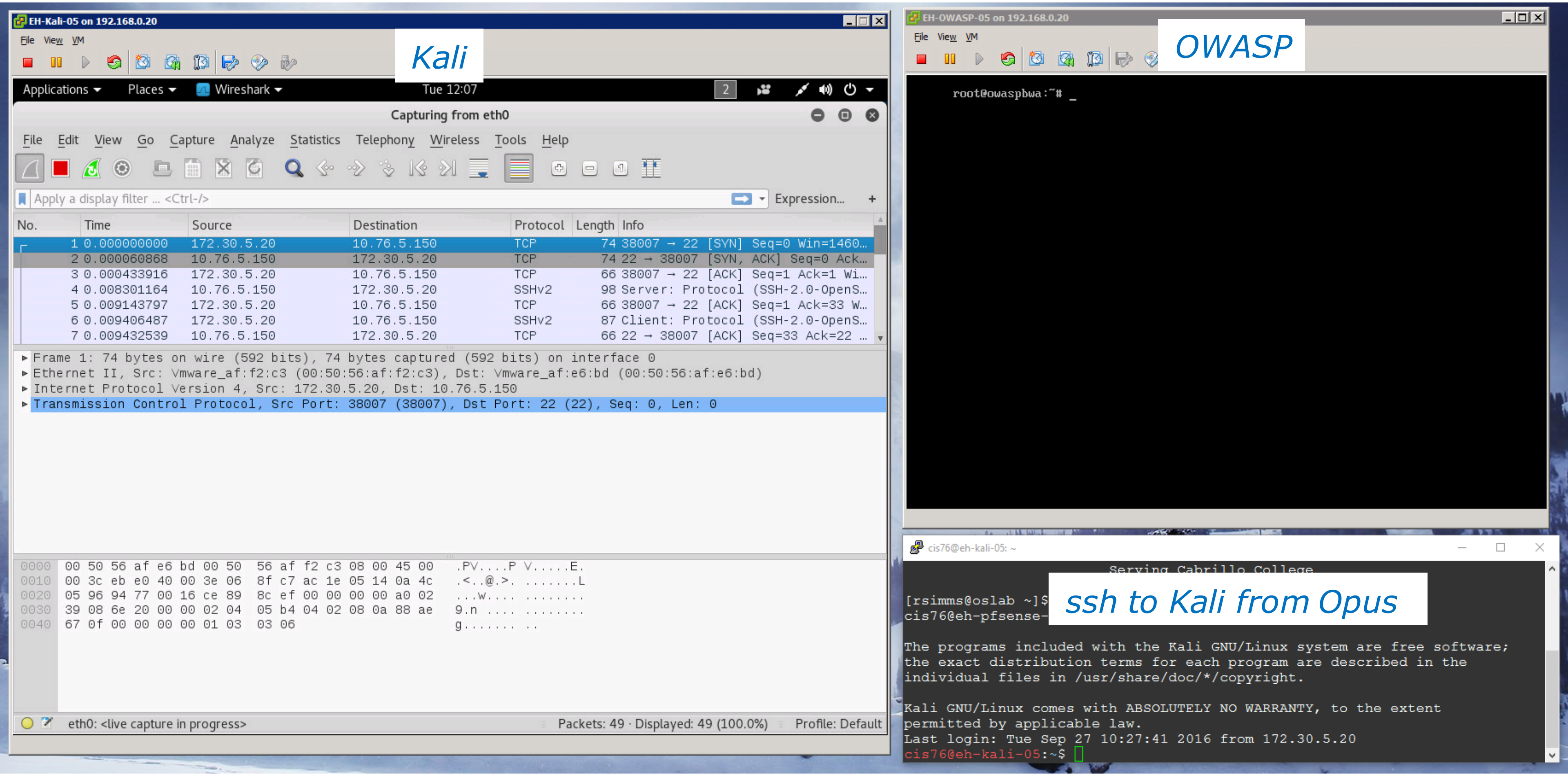
ss -t



```
root@eh-kali-05:~# ss -t
State       Recv-Q Send-Q Local Address:Port                 Peer Address:Port
ESTAB       0      0        10.76.5.150:ssh                   172.30.5.20:38007
root@eh-kali-05:~# 
```

Use the ss or netstat command with the -t option to monitor current tcp connections

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Applications
Places
Wireshark
Tue 12:07
Capturing from eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
Expression...
EH-OWASP-05 on 192.168.0.20
File View VM
cis76@eh-kali-05: ~

Kali

```
No. Time        Source        Destination  Protocol Length Info
  1 0.000000000 172.30.5.20   10.76.5.150  TCP      74 38007 → 22 [SYN] Seq=0 Win=1460…
  2 0.000060868 10.76.5.150   172.30.5.20  TCP      74 22 → 38007 [SYN, ACK] Seq=0 Ack…
  3 0.000433916 172.30.5.20   10.76.5.150  TCP      66 38007 → 22 [ACK] Seq=1 Ack=1 Wi…
  4 0.008301164 10.76.5.150   172.30.5.20  SSHv2    98 Server: Protocol (SSH-2.0-OpenS…
  5 0.009143797 172.30.5.20   10.76.5.150  TCP      66 38007 → 22 [ACK] Seq=1 Ack=33 W…
  6 0.009406487 172.30.5.20   10.76.5.150  SSHv2    87 Client: Protocol (SSH-2.0-OpenS…
  7 0.009432539 10.76.5.150   172.30.5.20  TCP      66 22 → 38007 [ACK] Seq=33 Ack=22 …
```

```
▸ Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0
▸ Ethernet II, Src: Vmware_af:f2:c3 (00:50:56:af:f2:c3), Dst: Vmware_af:e6:bd (00:50:56:af:e6:bd)
▸ Internet Protocol Version 4, Src: 172.30.5.20, Dst: 10.76.5.150
▸ Transmission Control Protocol, Src Port: 38007 (38007), Dst Port: 22 (22), Seq: 0, Len: 0
```

```
0000  00 50 56 af e6 bd 00 50  56 af f2 c3 08 00 45 00   .PV....P V.....E.
0010  00 3c eb e0 40 00 3e 06  8f c7 ac 1e 05 14 0a 4c   .<..@.>. .......L
0020  05 96 94 77 00 16 ce 89  8c ef 00 00 00 00 a0 02   ...w.... ........
0030  39 08 6e 20 00 00 02 04  05 b4 04 02 08 0a 88 ae   9.n .... ........
0040  67 0f 00 00 00 00 01 03  03 06                     g....... ..
```

```
eth0: <live capture in progress>    Packets: 49 · Displayed: 49 (100.0%)    Profile: Default
```

OWASP

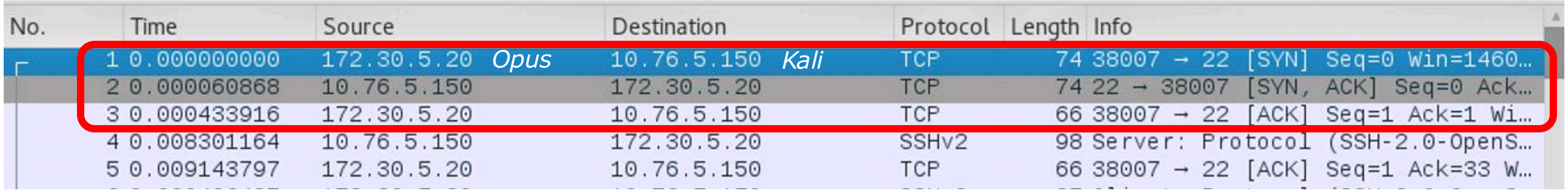
```
root@owaspbwa:~# _
```

ssh to Kali from Opus

```
                    Serving Cabrillo College

[rsimms@oslab ~]$
cis76@eh-pfsense-

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```

On Wireshark we can see the three-way handshake used to open the TCP connection

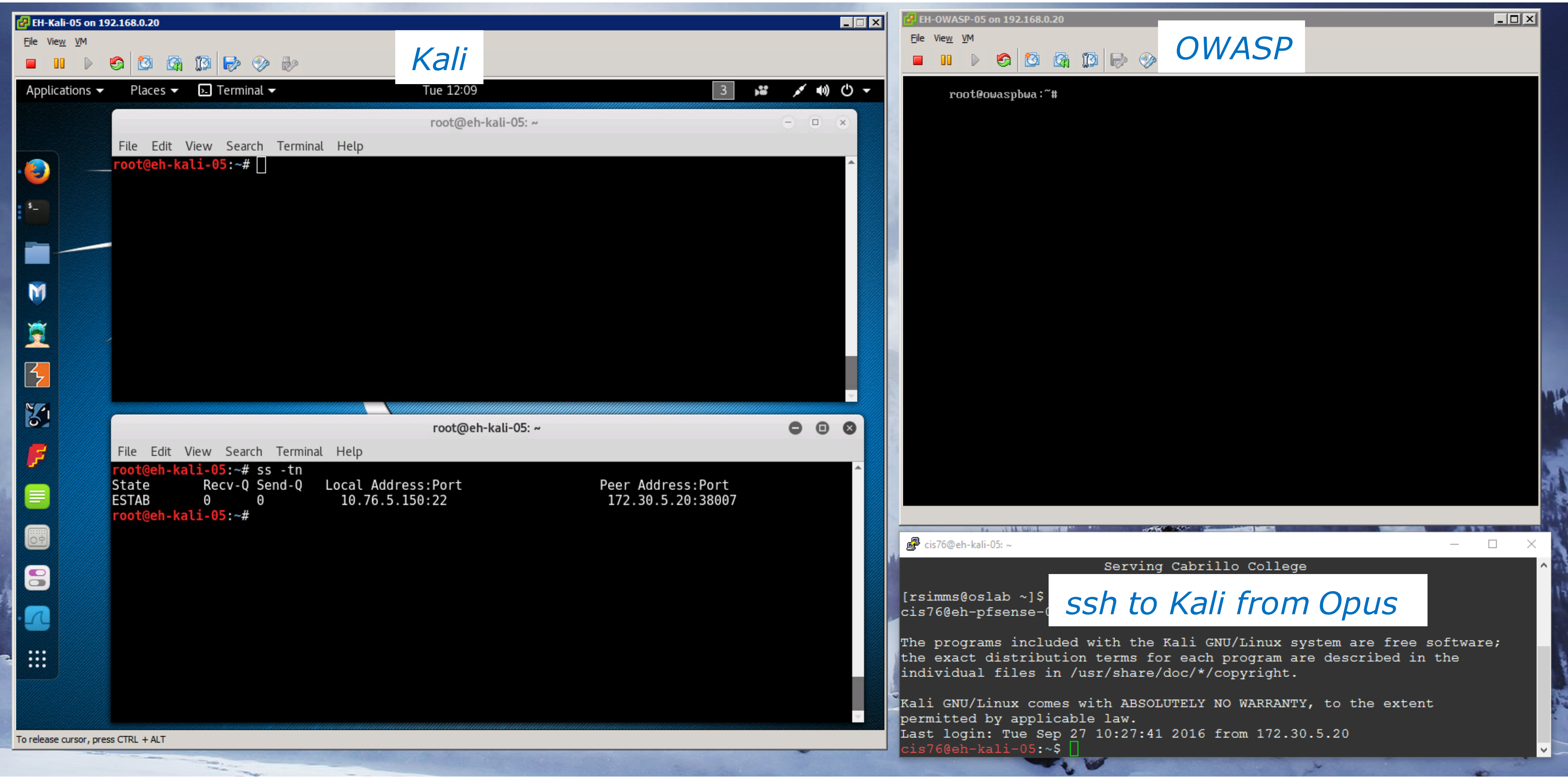
Monitoring TCP Connections



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	172.30.5.20 *Opus*	10.76.5.150 *Kali*	TCP	74	38007 → 22 [SYN] Seq=0 Win=1460…
2	0.000060868	10.76.5.150	172.30.5.20	TCP	74	22 → 38007 [SYN, ACK] Seq=0 Ack…
3	0.000433916	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [ACK] Seq=1 Ack=1 Wi…
4	0.008301164	10.76.5.150	172.30.5.20	SSHv2	98	Server: Protocol (SSH-2.0-OpenS…
5	0.009143797	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [ACK] Seq=1 Ack=33 W…

On Wireshark closeup showing the three-way handshake used to open the SSH connection from Opus to Kali

Monitoring TCP Connections



EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Terminal Tue 12:09
root@eh-kali-05: ~
File Edit View Search Terminal Help
EH-OWASP-05 on 192.168.0.20
cis76@eh-kali-05: ~
To release cursor, press CTRL + ALT

Kali

```
root@eh-kali-05:~# 
```

```
root@eh-kali-05:~# ss -tn
State       Recv-Q Send-Q    Local Address:Port                    Peer Address:Port
ESTAB       0      0           10.76.5.150:22                       172.30.5.20:38007
root@eh-kali-05:~#
```

OWASP

```
root@owaspbwa:~#
```

ssh to Kali from Opus

```
                          Serving Cabrillo College

[rsimms@oslab ~]$
cis76@eh-pfsense-(

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Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$ 
```
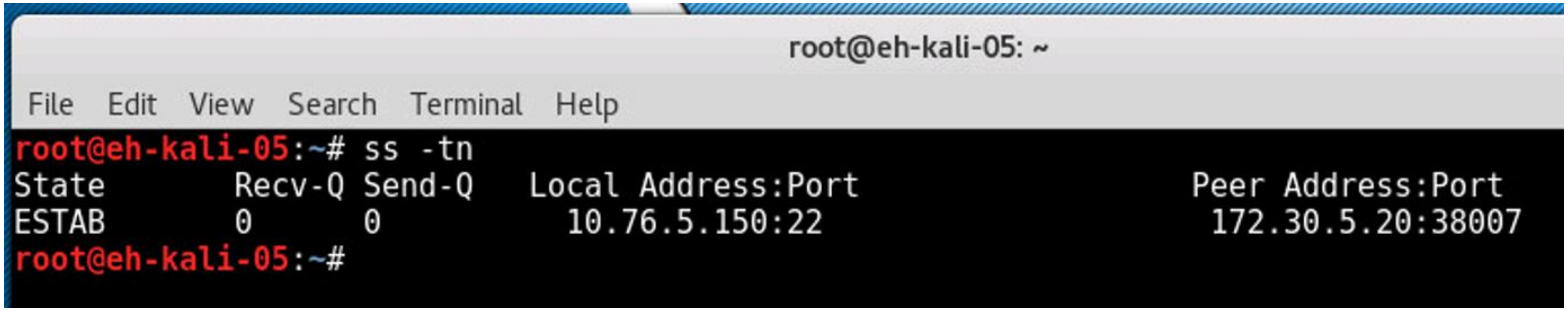

ss -tn

The -n option shows all values in numeric form. E.g. "22" instead of "ssh"

Monitoring TCP Connections

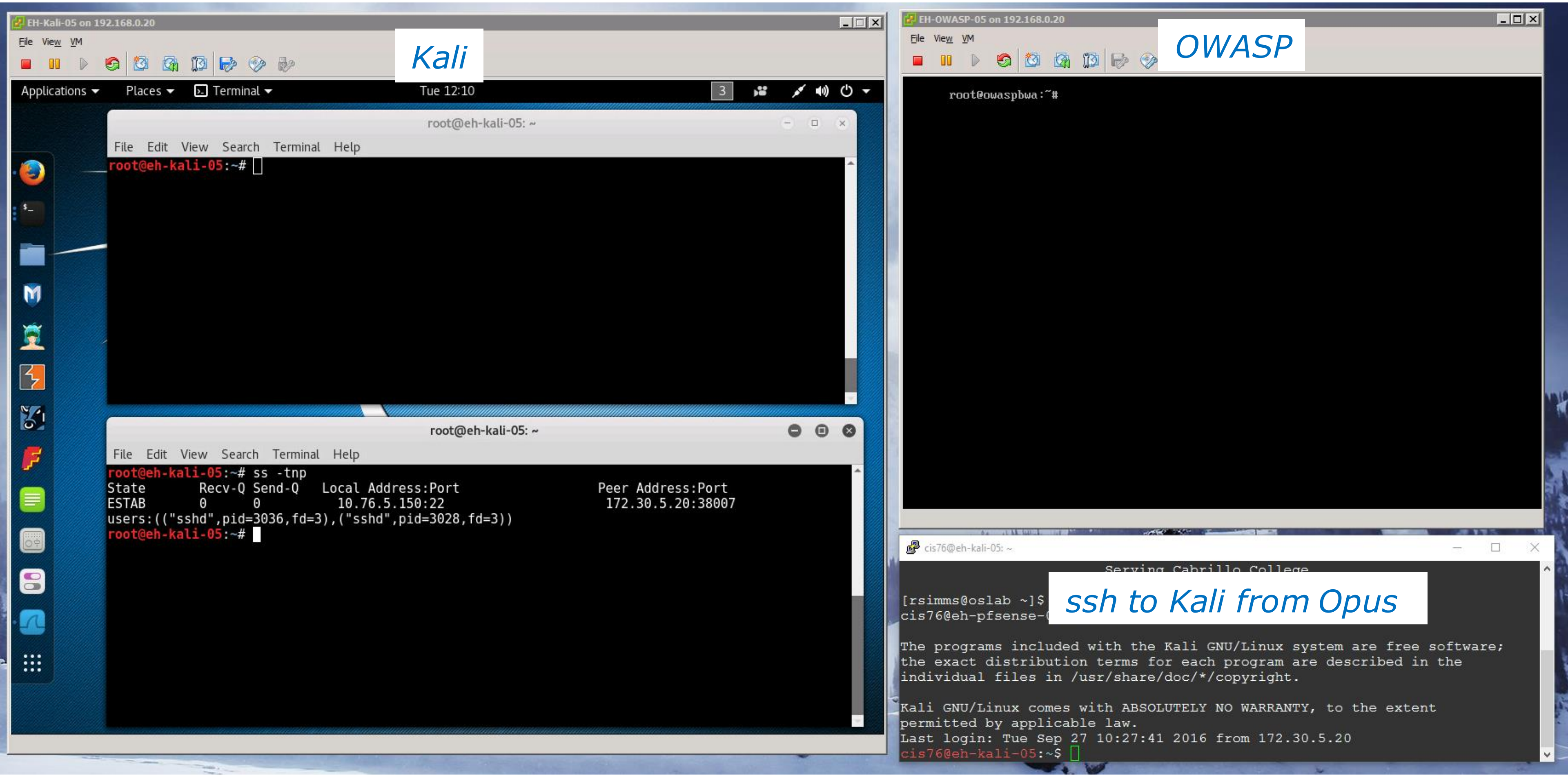


```
root@eh-kali-05:~# ss -tn
State       Recv-Q Send-Q   Local Address:Port                    Peer Address:Port
ESTAB       0      0          10.76.5.150:22                       172.30.5.20:38007
root@eh-kali-05:~#
```

ss -tn

The -n option shows all values in numeric form. E.g. "22" instead of "ssh"

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Terminal Tue 12:10
root@eh-kali-05: ~
File Edit View Search Terminal Help
EH-OWASP-05 on 192.168.0.20
cis76@eh-kali-05: ~

Kali

```
root@eh-kali-05:~#
```

```
root@eh-kali-05:~# ss -tnp
State       Recv-Q Send-Q   Local Address:Port                   Peer Address:Port
ESTAB       0      0          10.76.5.150:22                      172.30.5.20:38007
users:(("sshd",pid=3036,fd=3),("sshd",pid=3028,fd=3))
root@eh-kali-05:~#
```

OWASP

```
root@owaspbwa:~#
```

ssh to Kali from Opus

```
                 Serving Cabrillo College

[rsimms@oslab ~]$
cis76@eh-pfsense-(

The programs included with the Kali GNU/Linux system are free software;
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permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```
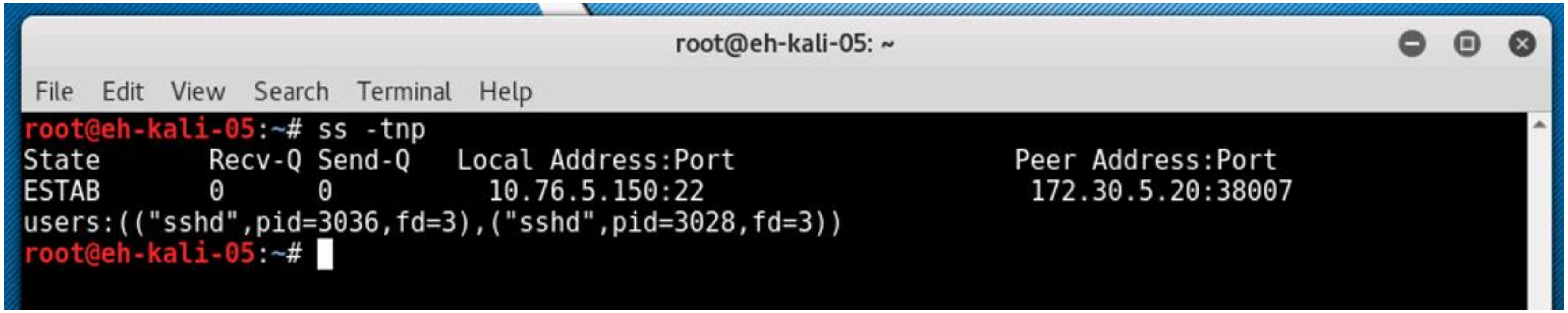

ss -tnp

The -p option shows the process using the connection. You must be the root user to use the -p option.

Monitoring TCP Connections



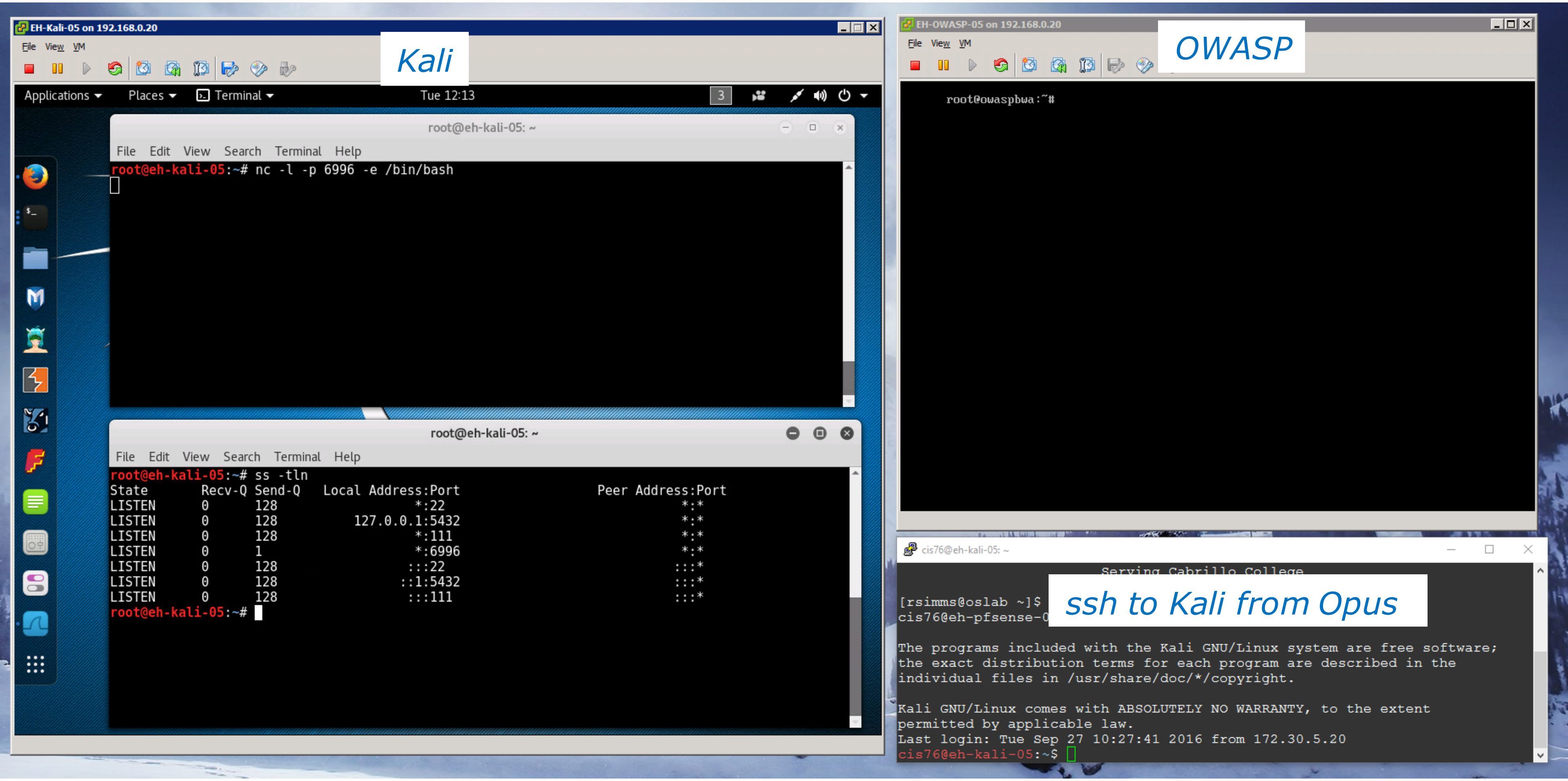
```
root@eh-kali-05:~# ss -tnp
State       Recv-Q Send-Q   Local Address:Port                 Peer Address:Port
ESTAB       0      0          10.76.5.150:22                    172.30.5.20:38007
users:(("sshd",pid=3036,fd=3),("sshd",pid=3028,fd=3))
root@eh-kali-05:~# 
```

ss -tnp

The -p option shows the process using the connection. You must be the root user to use the -p option.

Monitoring TCP Connections

nc -l -p 6996 -e /bin/bash


EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Terminal Tue 12:13
root@eh-kali-05: ~
File Edit View Search Terminal Help
EH-OWASP-05 on 192.168.0.20
cis76@eh-kali-05: ~

Kali

```
root@eh-kali-05:~# nc -l -p 6996 -e /bin/bash
```

```
root@eh-kali-05:~# ss -tln
State      Recv-Q Send-Q   Local Address:Port                 Peer Address:Port
LISTEN     0      128                  *:22                              *:*
LISTEN     0      128          127.0.0.1:5432                            *:*
LISTEN     0      128                  *:111                             *:*
LISTEN     0      1                    *:6996                            *:*
LISTEN     0      128                 :::22                             :::*
LISTEN     0      128                ::1:5432                           :::*
LISTEN     0      128                 :::111                            :::*
root@eh-kali-05:~#
```

OWASP

```
root@owaspbwa:~#
```

ssh to Kali from Opus

```
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[rsimms@oslab ~]$
cis76@eh-pfsense-0

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Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```
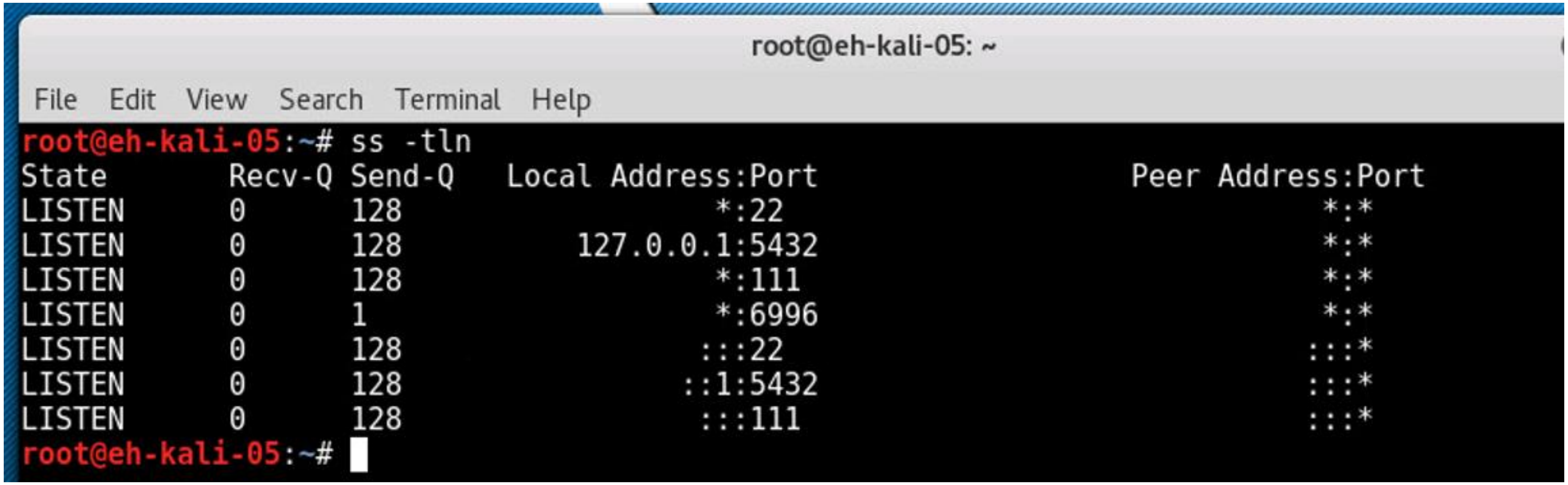

ss -tln

The -l option on ss or netstat shows the ports that are listening for a connection. The nc command was used to listen to port 6996.

Monitoring TCP Connections



```
root@eh-kali-05:~# ss -tln
State       Recv-Q Send-Q   Local Address:Port                  Peer Address:Port
LISTEN      0      128                  *:22                               *:*
LISTEN      0      128          127.0.0.1:5432                             *:*
LISTEN      0      128                  *:111                              *:*
LISTEN      0      1                    *:6996                             *:*
LISTEN      0      128                 :::22                              :::*
LISTEN      0      128                ::1:5432                            :::*
LISTEN      0      128                 :::111                             :::*
root@eh-kali-05:~#
```

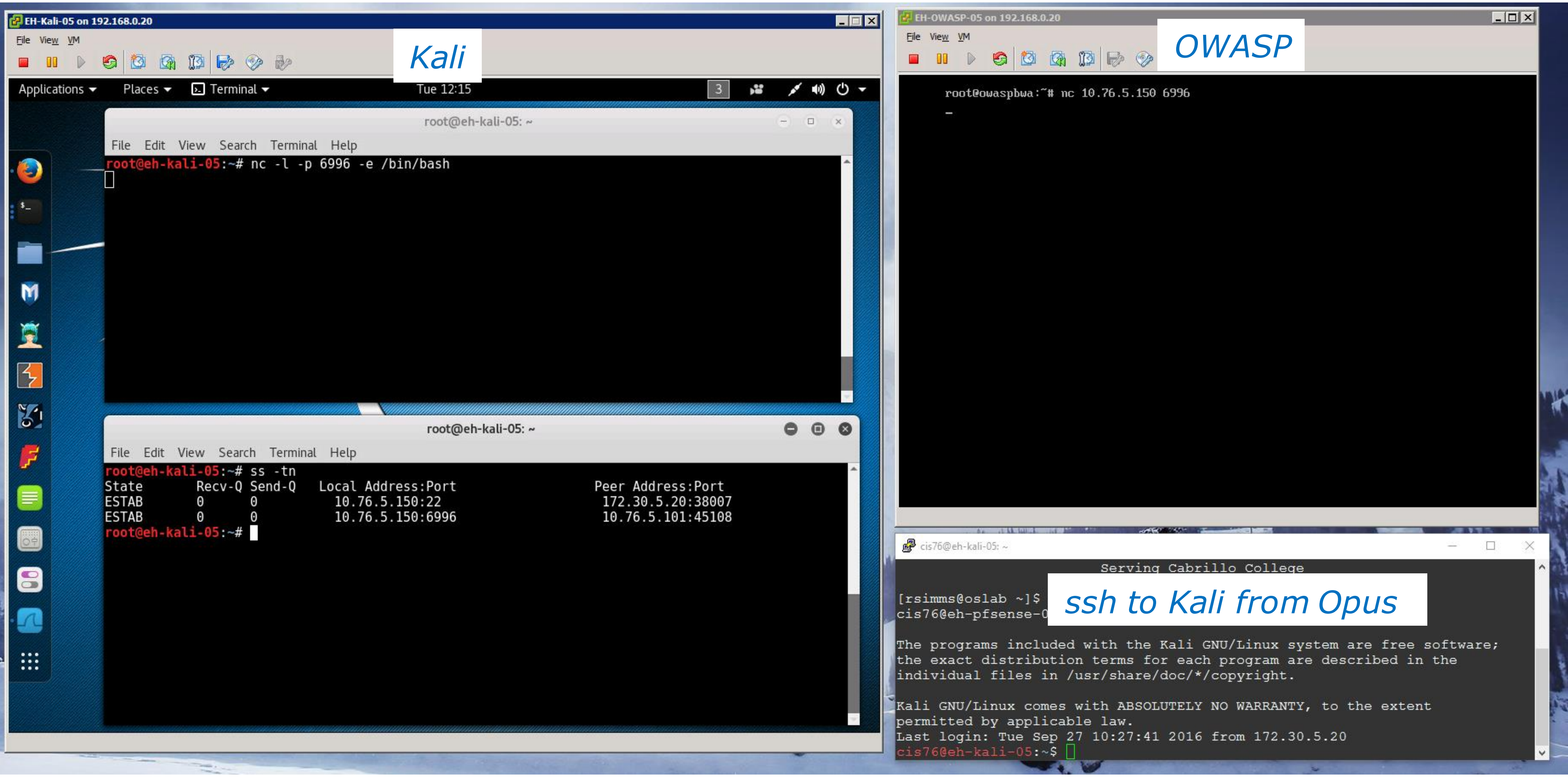
ss -tln

The -l option on ss or netstat shows the ports that are listening for a connection. The nc command was used to listen to port 6996.

Monitoring TCP Connections

nc -l -p 6996 -e /bin/bash

nc 10.76.5.150 6996



```
root@eh-kali-05:~# nc -l -p 6996 -e /bin/bash
```

```
root@eh-kali-05:~# ss -tn
State      Recv-Q Send-Q    Local Address:Port                Peer Address:Port
ESTAB      0      0           10.76.5.150:22                    172.30.5.20:38007
ESTAB      0      0           10.76.5.150:6996                  10.76.5.101:45108
root@eh-kali-05:~#
```

```
root@owaspbwa:~# nc 10.76.5.150 6996
_
```

```
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[rsimms@oslab ~]$
cis76@eh-pfsense-0

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permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```
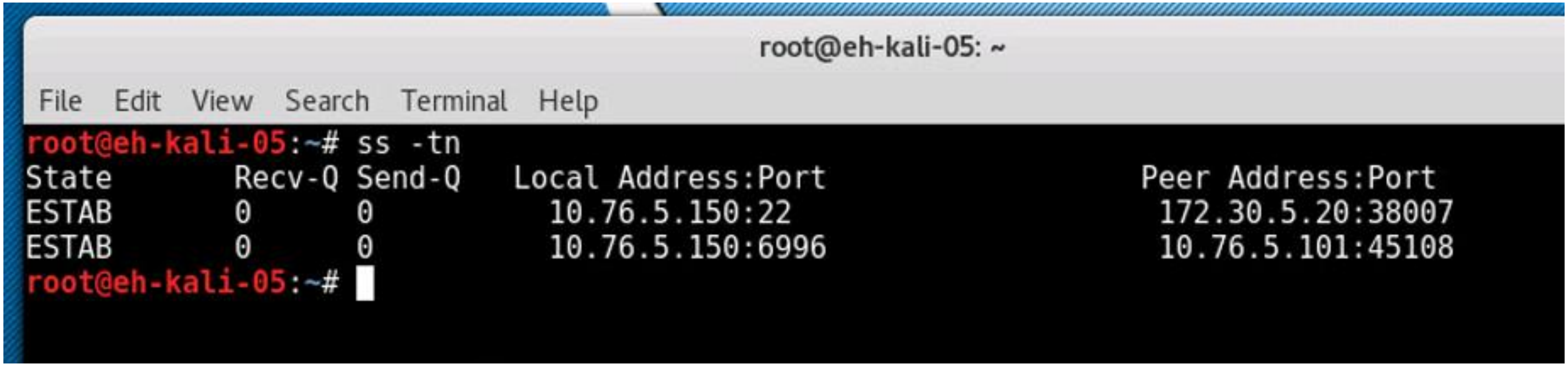

ss -tn

OWASP used nc to connect to Kali at port 6996. Now there are two established connections. One to Opus and One to OWASP.

Monitoring TCP Connections

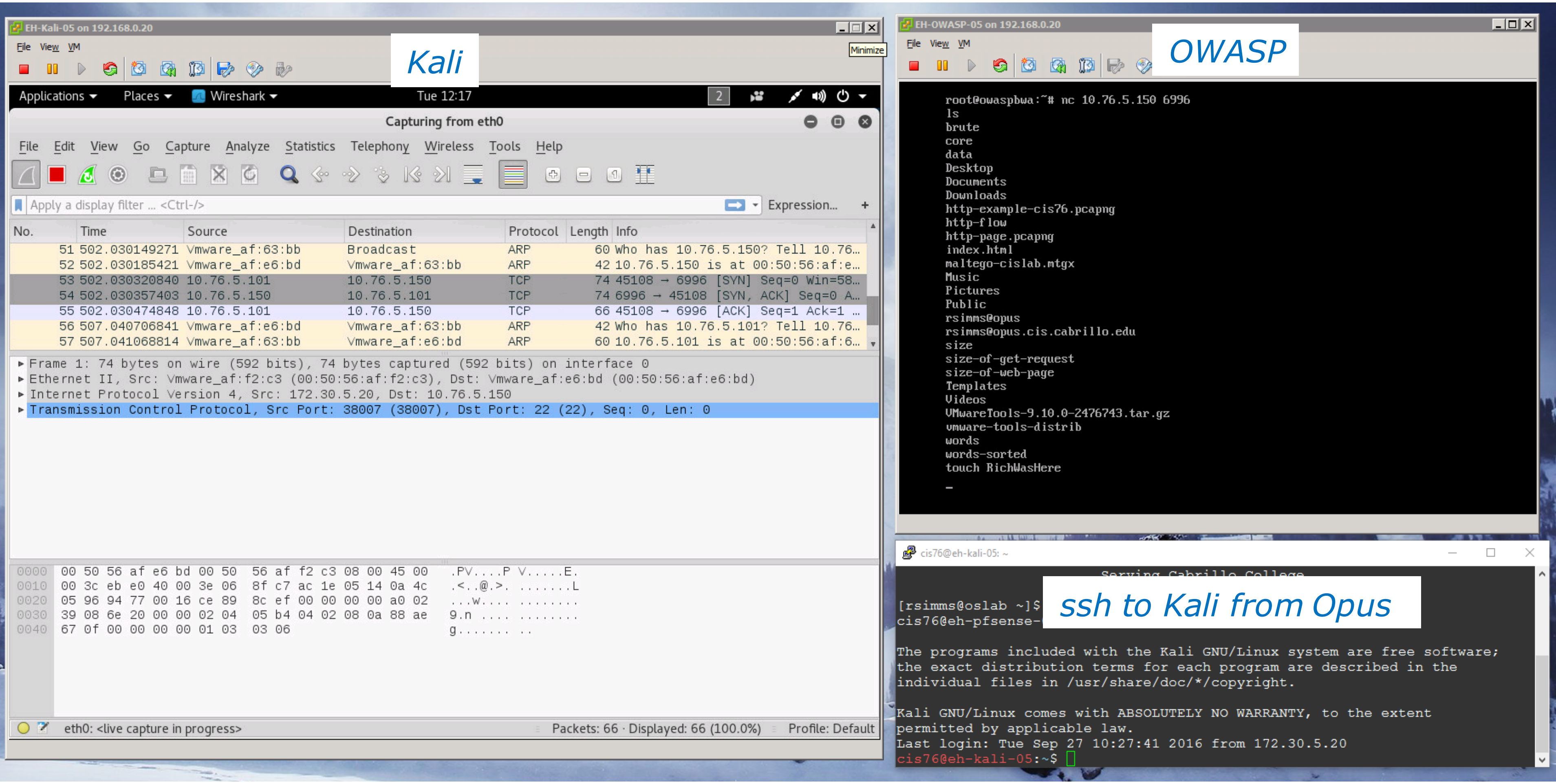


```
root@eh-kali-05:~# ss -tn
State       Recv-Q Send-Q   Local Address:Port                  Peer Address:Port
ESTAB       0      0          10.76.5.150:22                     172.30.5.20:38007
ESTAB       0      0          10.76.5.150:6996                   10.76.5.101:45108
root@eh-kali-05:~# 
```

ss -tnp

Close up of the two established connections. One to Opus and One to OWASP.

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Minimize
Applications ▾ Places ▾ Wireshark ▾ Tue 12:17
Capturing from eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
Expression... +
EH-OWASP-05 on 192.168.0.20
File View VM
cis76@eh-kali-05: ~

Kali

```
No.  Time            Source             Destination        Protocol Length Info
  51 502.030149271 Vmware_af:63:bb    Broadcast          ARP      60 Who has 10.76.5.150? Tell 10.76…
  52 502.030185421 Vmware_af:e6:bd    Vmware_af:63:bb    ARP      42 10.76.5.150 is at 00:50:56:af:e…
  53 502.030320840 10.76.5.101        10.76.5.150        TCP      74 45108 → 6996 [SYN] Seq=0 Win=58…
  54 502.030357403 10.76.5.150        10.76.5.101        TCP      74 6996 → 45108 [SYN, ACK] Seq=0 A…
  55 502.030474848 10.76.5.101        10.76.5.150        TCP      66 45108 → 6996 [ACK] Seq=1 Ack=1 …
  56 507.040706841 Vmware_af:e6:bd    Vmware_af:63:bb    ARP      42 Who has 10.76.5.101? Tell 10.76…
  57 507.041068814 Vmware_af:63:bb    Vmware_af:e6:bd    ARP      60 10.76.5.101 is at 00:50:56:af:6…
```

```
▸ Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0
▸ Ethernet II, Src: Vmware_af:f2:c3 (00:50:56:af:f2:c3), Dst: Vmware_af:e6:bd (00:50:56:af:e6:bd)
▸ Internet Protocol Version 4, Src: 172.30.5.20, Dst: 10.76.5.150
▸ Transmission Control Protocol, Src Port: 38007 (38007), Dst Port: 22 (22), Seq: 0, Len: 0
```

```
0000  00 50 56 af e6 bd 00 50  56 af f2 c3 08 00 45 00   .PV....P V.....E.
0010  00 3c eb e0 40 00 3e 06  8f c7 ac 1e 05 14 0a 4c   .<..@.>. .......L
0020  05 96 94 77 00 16 ce 89  8c ef 00 00 00 00 a0 02   ...w.... ........
0030  39 08 6e 20 00 00 02 04  05 b4 04 02 08 0a 88 ae   9.n .... ........
0040  67 0f 00 00 00 00 01 03  03 06                     g....... ..
```

eth0: <live capture in progress> Packets: 66 · Displayed: 66 (100.0%) Profile: Default

OWASP

```
root@owaspbwa:~# nc 10.76.5.150 6996
ls
brute
core
data
Desktop
Documents
Downloads
http-example-cis76.pcapng
http-flow
http-page.pcapng
index.html
maltego-cislab.mtgx
Music
Pictures
Public
rsimms@opus
rsimms@opus.cis.cabrillo.edu
size
size-of-get-request
size-of-web-page
Templates
Videos
VMwareTools-9.10.0-2476743.tar.gz
vmware-tools-distrib
words
words-sorted
touch RichWasHere
_
```

ssh to Kali from Opus

```
                    Serving Cabrillo College

[rsimms@oslab ~]$
cis76@eh-pfsense-

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individual files in /usr/share/doc/*/copyright.

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permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$
```
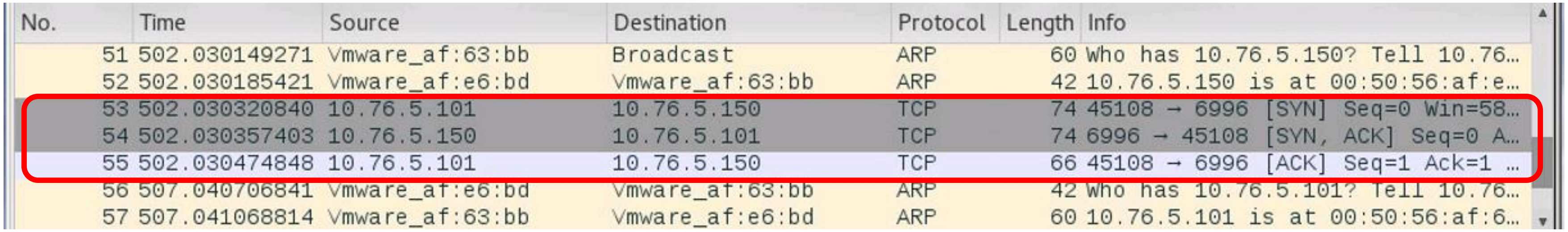

Wireshark showing the second netcat connection being created.

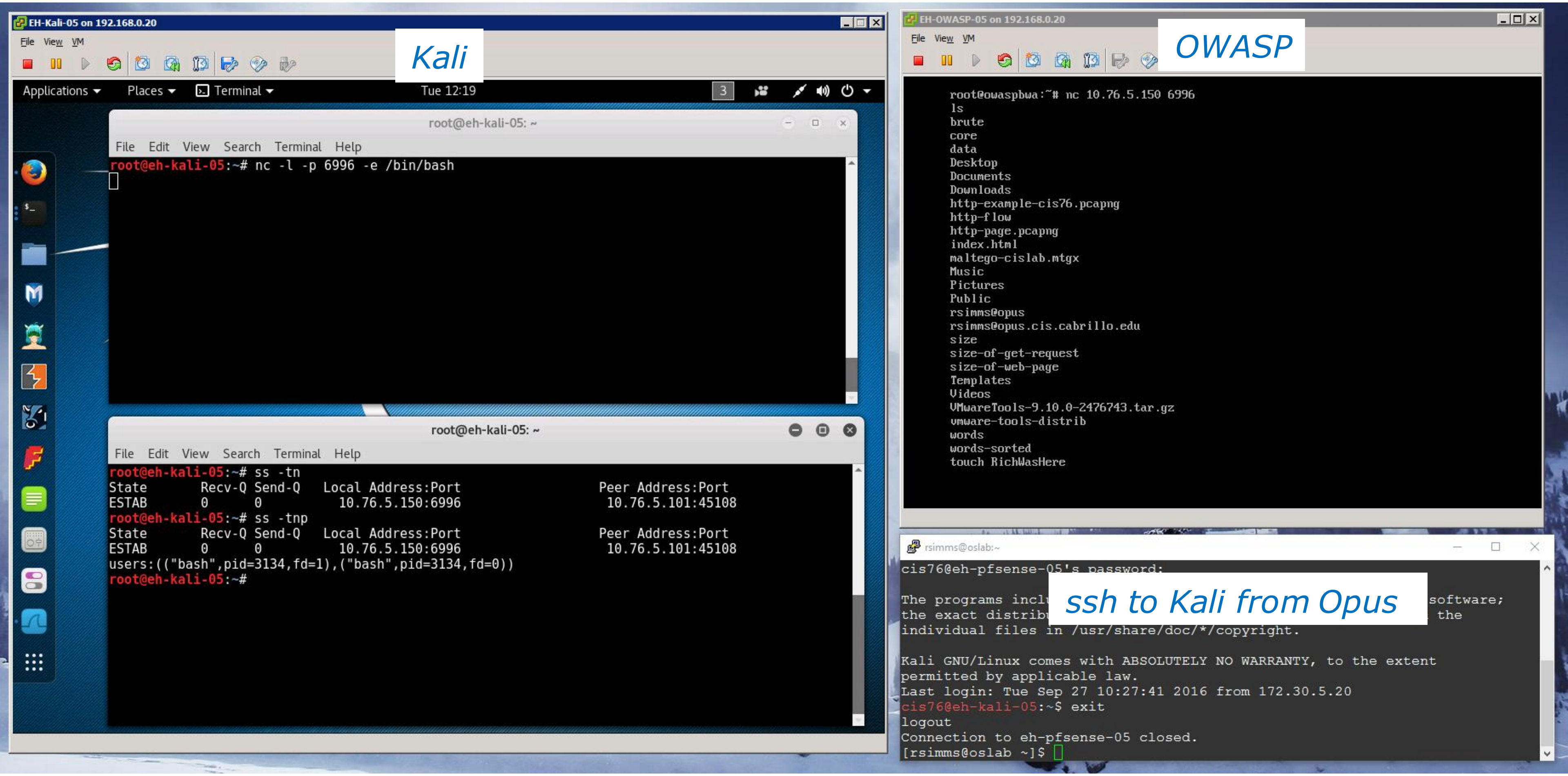
Monitoring TCP Connections



No.	Time	Source	Destination	Protocol	Length	Info
51	502.030149271	Vmware_af:63:bb	Broadcast	ARP	60	Who has 10.76.5.150? Tell 10.76…
52	502.030185421	Vmware_af:e6:bd	Vmware_af:63:bb	ARP	42	10.76.5.150 is at 00:50:56:af:e…
53	502.030320840	10.76.5.101	10.76.5.150	TCP	74	45108 → 6996 [SYN] Seq=0 Win=58…
54	502.030357403	10.76.5.150	10.76.5.101	TCP	74	6996 → 45108 [SYN, ACK] Seq=0 A…
55	502.030474848	10.76.5.101	10.76.5.150	TCP	66	45108 → 6996 [ACK] Seq=1 Ack=1 …
56	507.040706841	Vmware_af:e6:bd	Vmware_af:63:bb	ARP	42	Who has 10.76.5.101? Tell 10.76…
57	507.041068814	Vmware_af:63:bb	Vmware_af:e6:bd	ARP	60	10.76.5.101 is at 00:50:56:af:6…

Wireshark showing the second netcat connection being created with three-way handshake..

Monitoring TCP Connections



EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Terminal Tue 12:19
root@eh-kali-05: ~
File Edit View Search Terminal Help
EH-OWASP-05 on 192.168.0.20
rsimms@oslab:~

Kali

```
root@eh-kali-05:~# nc -l -p 6996 -e /bin/bash
```

```
root@eh-kali-05:~# ss -tn
State      Recv-Q Send-Q    Local Address:Port                 Peer Address:Port
ESTAB      0      0           10.76.5.150:6996                  10.76.5.101:45108
root@eh-kali-05:~# ss -tnp
State      Recv-Q Send-Q    Local Address:Port                 Peer Address:Port
ESTAB      0      0           10.76.5.150:6996                  10.76.5.101:45108
users:(("bash",pid=3134,fd=1),("bash",pid=3134,fd=0))
root@eh-kali-05:~#
```

OWASP

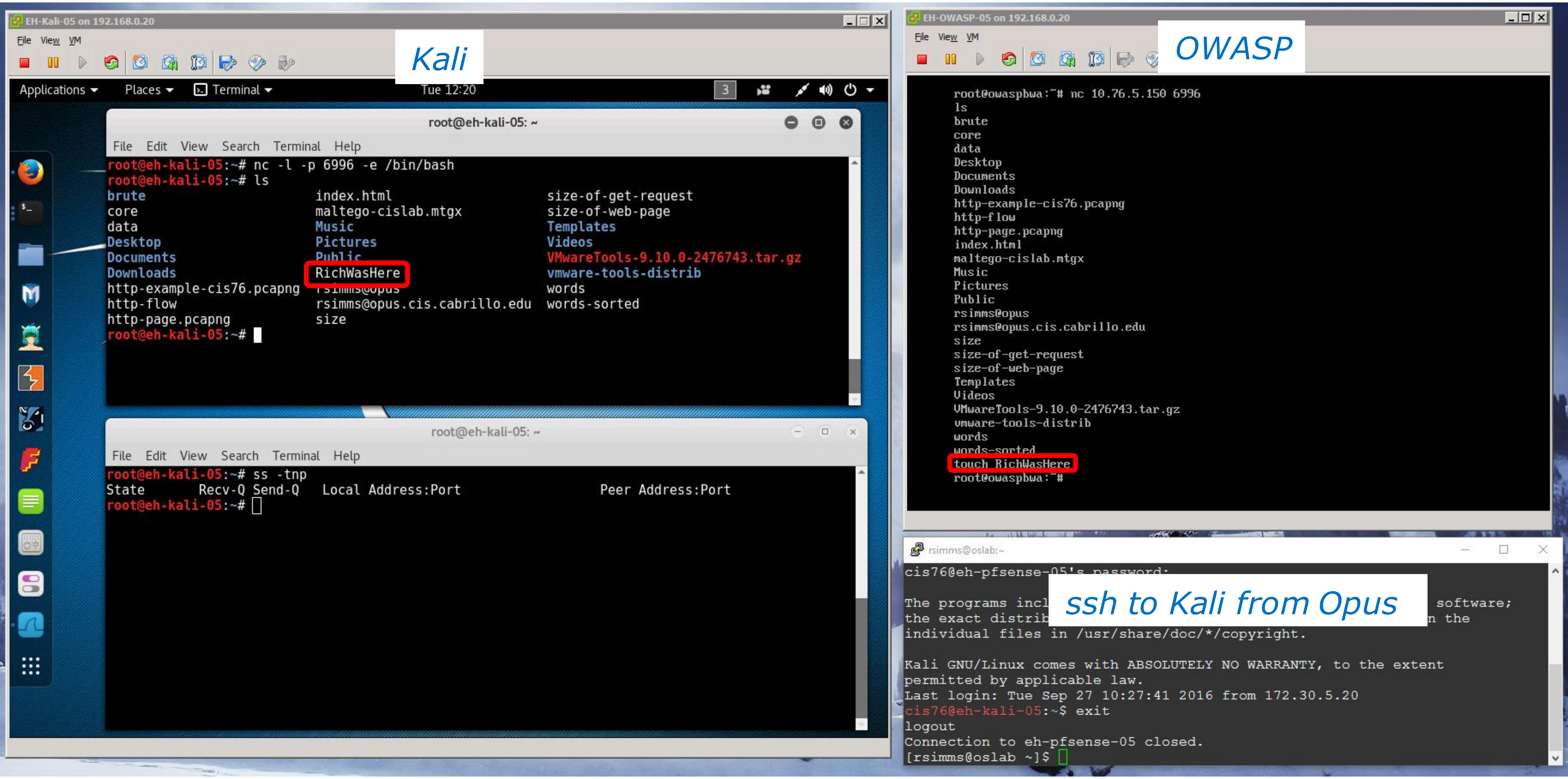
```
root@owaspbwa:~# nc 10.76.5.150 6996
ls
brute
core
data
Desktop
Documents
Downloads
http-example-cis76.pcapng
http-flow
http-page.pcapng
index.html
maltego-cislab.mtgx
Music
Pictures
Public
rsimms@opus
rsimms@opus.cis.cabrillo.edu
size
size-of-get-request
size-of-web-page
Templates
Videos
VMwareTools-9.10.0-2476743.tar.gz
vmware-tools-distrib
words
words-sorted
touch RichWasHere
```

ssh to Kali from Opus

```
cis76@eh-pfsense-05's password:

The programs inclu                              software;
the exact distribu                              the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$ exit
logout
Connection to eh-pfsense-05 closed.
[rsimms@oslab ~]$
```

Exit the login from Opus and we are down to just one connection

Monitoring TCP Connections



Kali

```
root@eh-kali-05:~# nc -l -p 6996 -e /bin/bash
root@eh-kali-05:~# ls
brute                         index.html                  size-of-get-request
core                          maltego-cislab.mtgx         size-of-web-page
data                          Music                       Templates
Desktop                       Pictures                    Videos
Documents                     Public                      VMwareTools-9.10.0-2476743.tar.gz
Downloads                     RichWasHere                 vmware-tools-distrib
http-example-cis76.pcapng     rsimms@opus                 words
http-flow                     rsimms@opus.cis.cabrillo.edu  words-sorted
http-page.pcapng              size
root@eh-kali-05:~# 
```

```
root@eh-kali-05:~# ss -tnp
State       Recv-Q Send-Q    Local Address:Port              Peer Address:Port
root@eh-kali-05:~# 
```

OWASP

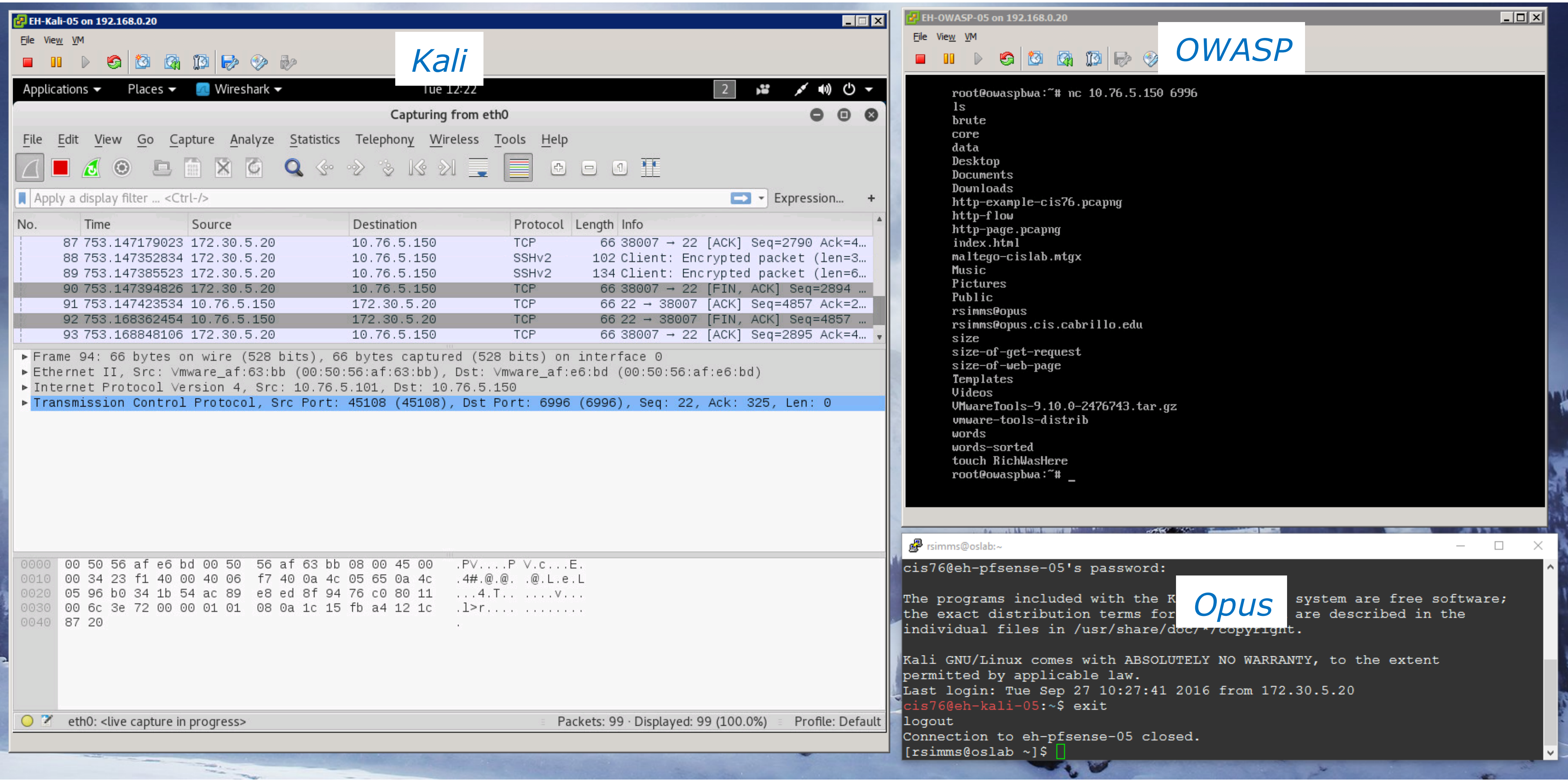
```
root@owaspbwa:~# nc 10.76.5.150 6996
ls
brute
core
data
Desktop
Documents
Downloads
http-example-cis76.pcapng
http-flow
http-page.pcapng
index.html
maltego-cislab.mtgx
Music
Pictures
Public
rsimms@opus
rsimms@opus.cis.cabrillo.edu
size
size-of-get-request
size-of-web-page
Templates
Videos
VMwareTools-9.10.0-2476743.tar.gz
vmware-tools-distrib
words
words-sorted
touch RichWasHere
root@owaspbwa:~#
```

ssh to Kali from Opus

```
cis76@eh-pfsense-05's password:

The programs incl                                      software;
the exact distrib                                     n the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$ exit
logout
Connection to eh-pfsense-05 closed.
[rsimms@oslab ~]$ 
```

Send EOF to nc and the second connection is closed too. Notice how the OWASP user was able to use netcat to list the files on Kali and leave a mark!

Monitoring TCP Connections


EH-Kali-05 on 192.168.0.20
File View VM
Kali
Applications ▾ Places ▾ Wireshark ▾ Tue 12:22
Capturing from eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
Expression...
EH-OWASP-05 on 192.168.0.20
File View VM
OWASP
rsimms@oslab:~
Opus

```
No.   Time          Source        Destination   Protocol  Length Info
   87 753.147179023 172.30.5.20   10.76.5.150   TCP           66 38007 → 22 [ACK] Seq=2790 Ack=4…
   88 753.147352834 172.30.5.20   10.76.5.150   SSHv2        102 Client: Encrypted packet (len=3…
   89 753.147385523 172.30.5.20   10.76.5.150   SSHv2        134 Client: Encrypted packet (len=6…
   90 753.147394826 172.30.5.20   10.76.5.150   TCP           66 38007 → 22 [FIN, ACK] Seq=2894 …
   91 753.147423534 10.76.5.150   172.30.5.20   TCP           66 22 → 38007 [ACK] Seq=4857 Ack=2…
   92 753.168362454 10.76.5.150   172.30.5.20   TCP           66 22 → 38007 [FIN, ACK] Seq=4857 …
   93 753.168848106 172.30.5.20   10.76.5.150   TCP           66 38007 → 22 [ACK] Seq=2895 Ack=4…
```

```
▸ Frame 94: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
▸ Ethernet II, Src: Vmware_af:63:bb (00:50:56:af:63:bb), Dst: Vmware_af:e6:bd (00:50:56:af:e6:bd)
▸ Internet Protocol Version 4, Src: 10.76.5.101, Dst: 10.76.5.150
▸ Transmission Control Protocol, Src Port: 45108 (45108), Dst Port: 6996 (6996), Seq: 22, Ack: 325, Len: 0
```

```
0000  00 50 56 af e6 bd 00 50  56 af 63 bb 08 00 45 00   .PV....P V.c...E.
0010  00 34 23 f1 40 00 40 06  f7 40 0a 4c 05 65 0a 4c   .4#.@.@. .@.L.e.L
0020  05 96 b0 34 1b 54 ac 89  e8 ed 8f 94 76 c0 80 11   ...4.T.. ....v...
0030  00 6c 3e 72 00 00 01 01  08 0a 1c 15 fb a4 12 1c   .l>r.... ........
0040  87 20                                              .
```

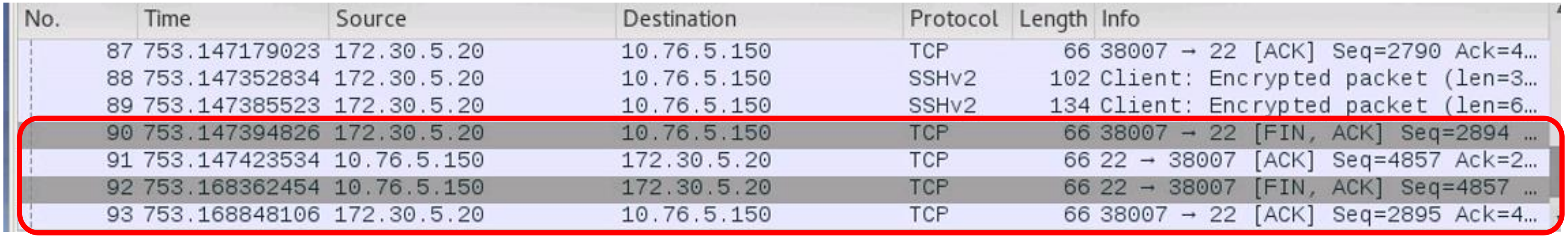
eth0: <live capture in progress> Packets: 99 · Displayed: 99 (100.0%) Profile: Default

```
root@owaspbwa:~# nc 10.76.5.150 6996
ls
brute
core
data
Desktop
Documents
Downloads
http-example-cis76.pcapng
http-flow
http-page.pcapng
index.html
maltego-cislab.mtgx
Music
Pictures
Public
rsimms@opus
rsimms@opus.cis.cabrillo.edu
size
size-of-get-request
size-of-web-page
Templates
Videos
VMwareTools-9.10.0-2476743.tar.gz
vmware-tools-distrib
words
words-sorted
touch RichWasHere
root@owaspbwa:~# _
```

```
cis76@eh-pfsense-05's password:

The programs included with the K         system are free software;
the exact distribution terms for         are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$ exit
logout
Connection to eh-pfsense-05 closed.
[rsimms@oslab ~]$
```

Wireshark showing the connection used for the SSH session closing

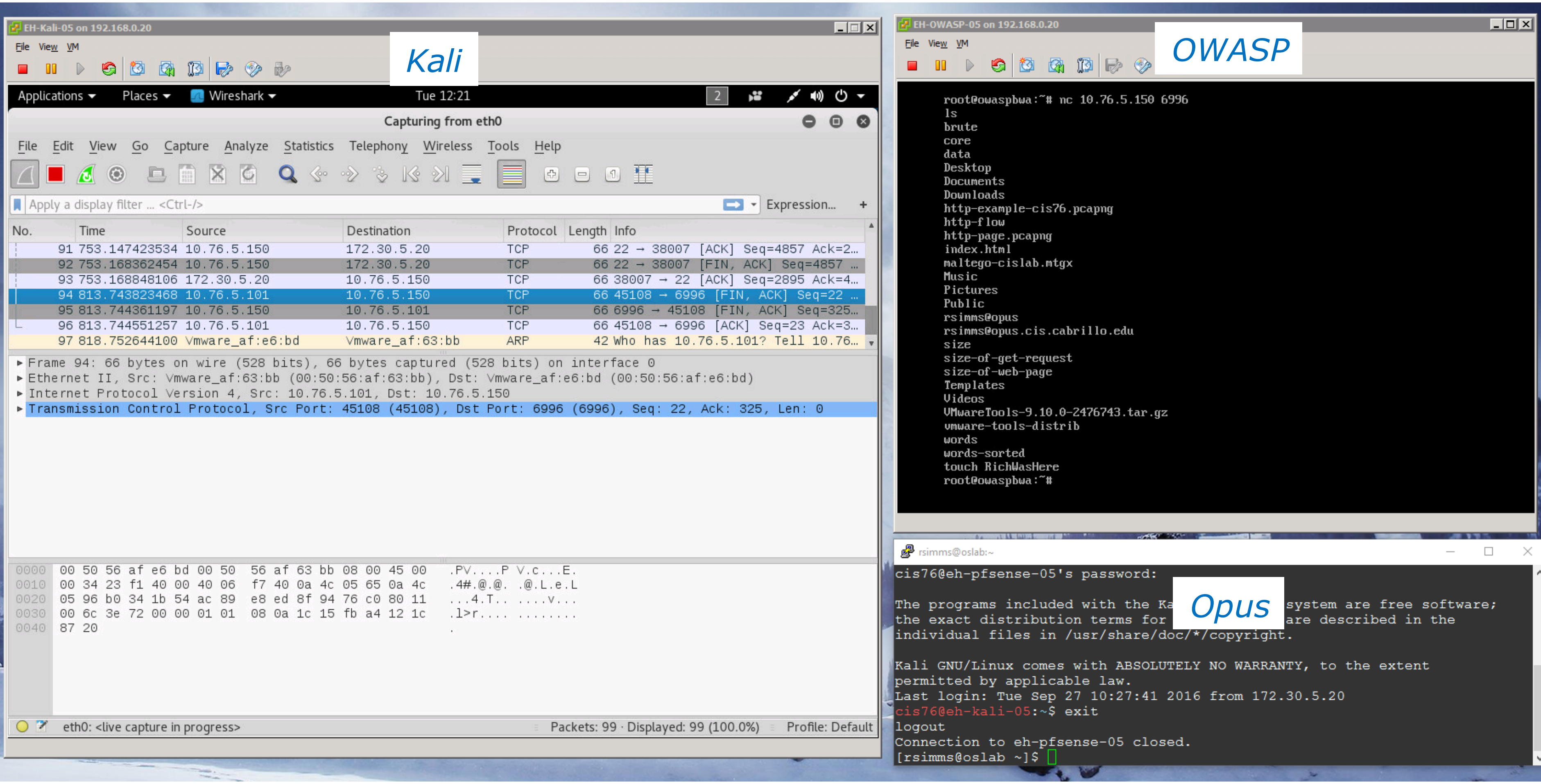
Monitoring TCP Connections



No.	Time	Source	Destination	Protocol	Length	Info
87	753.147179023	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [ACK] Seq=2790 Ack=4…
88	753.147352834	172.30.5.20	10.76.5.150	SSHv2	102	Client: Encrypted packet (len=3…
89	753.147385523	172.30.5.20	10.76.5.150	SSHv2	134	Client: Encrypted packet (len=6…
90	753.147394826	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [FIN, ACK] Seq=2894 …
91	753.147423534	10.76.5.150	172.30.5.20	TCP	66	22 → 38007 [ACK] Seq=4857 Ack=2…
92	753.168362454	10.76.5.150	172.30.5.20	TCP	66	22 → 38007 [FIN, ACK] Seq=4857 …
93	753.168848106	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [ACK] Seq=2895 Ack=4…

Wireshark showing the connection used for the SSH session closing

Monitoring TCP Connections


Kali
EH-Kali-05 on 192.168.0.20
File View VM
Applications Places Wireshark Tue 12:21
Capturing from eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
Expression...
OWASP
EH-OWASP-05 on 192.168.0.20
File View VM
Opus
rsimms@oslab:~

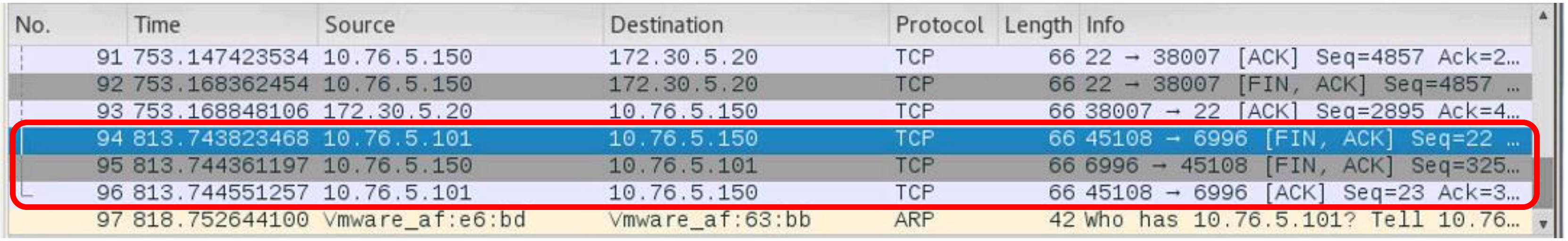
```
No.  Time           Source             Destination        Protocol  Length  Info
  91 753.147423534  10.76.5.150        172.30.5.20        TCP           66  22 → 38007 [ACK] Seq=4857 Ack=2…
  92 753.168362454  10.76.5.150        172.30.5.20        TCP           66  22 → 38007 [FIN, ACK] Seq=4857 …
  93 753.168848106  172.30.5.20        10.76.5.150        TCP           66  38007 → 22 [ACK] Seq=2895 Ack=4…
  94 813.743823468  10.76.5.101        10.76.5.150        TCP           66  45108 → 6996 [FIN, ACK] Seq=22 …
  95 813.744361197  10.76.5.150        10.76.5.101        TCP           66  6996 → 45108 [FIN, ACK] Seq=325…
  96 813.744551257  10.76.5.101        10.76.5.150        TCP           66  45108 → 6996 [ACK] Seq=23 Ack=3…
  97 818.752644100  Vmware_af:e6:bd    Vmware_af:63:bb    ARP           42  Who has 10.76.5.101? Tell 10.76…

▸ Frame 94: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
▸ Ethernet II, Src: Vmware_af:63:bb (00:50:56:af:63:bb), Dst: Vmware_af:e6:bd (00:50:56:af:e6:bd)
▸ Internet Protocol Version 4, Src: 10.76.5.101, Dst: 10.76.5.150
▸ Transmission Control Protocol, Src Port: 45108 (45108), Dst Port: 6996 (6996), Seq: 22, Ack: 325, Len: 0

0000  00 50 56 af e6 bd 00 50  56 af 63 bb 08 00 45 00   .PV....P V.c...E.
0010  00 34 23 f1 40 00 40 06  f7 40 0a 4c 05 65 0a 4c   .4#.@.@. .@.L.e.L
0020  05 96 b0 34 1b 54 ac 89  e8 ed 8f 94 76 c0 80 11   ...4.T.. ....v...
0030  00 6c 3e 72 00 00 01 01  08 0a 1c 15 fb a4 12 1c   .l>r.... ........
0040  87 20                                              .

eth0: <live capture in progress>     Packets: 99 · Displayed: 99 (100.0%)     Profile: Default
```

```
root@owaspbwa:~# nc 10.76.5.150 6996
ls
brute
core
data
Desktop
Documents
Downloads
http-example-cis76.pcapng
http-flow
http-page.pcapng
index.html
maltego-cislab.mtgx
Music
Pictures
Public
rsimms@opus
rsimms@opus.cis.cabrillo.edu
size
size-of-get-request
size-of-web-page
Templates
Videos
VMwareTools-9.10.0-2476743.tar.gz
vmware-tools-distrib
words
words-sorted
touch RichWasHere
root@owaspbwa:~#
```

```
cis76@eh-pfsense-05's password:

The programs included with the Ka          system are free software;
the exact distribution terms for           are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Sep 27 10:27:41 2016 from 172.30.5.20
cis76@eh-kali-05:~$ exit
logout
Connection to eh-pfsense-05 closed.
[rsimms@oslab ~]$
```

Wireshark showing the connection used for the netcat session closing

Monitoring TCP Connections



No.	Time	Source	Destination	Protocol	Length	Info
91	753.147423534	10.76.5.150	172.30.5.20	TCP	66	22 → 38007 [ACK] Seq=4857 Ack=2…
92	753.168362454	10.76.5.150	172.30.5.20	TCP	66	22 → 38007 [FIN, ACK] Seq=4857 …
93	753.168848106	172.30.5.20	10.76.5.150	TCP	66	38007 → 22 [ACK] Seq=2895 Ack=4…
94	813.743823468	10.76.5.101	10.76.5.150	TCP	66	45108 → 6996 [FIN, ACK] Seq=22 …
95	813.744361197	10.76.5.150	10.76.5.101	TCP	66	6996 → 45108 [FIN, ACK] Seq=325…
96	813.744551257	10.76.5.101	10.76.5.150	TCP	66	45108 → 6996 [ACK] Seq=23 Ack=3…
97	818.752644100	Vmware_af:e6:bd	Vmware_af:63:bb	ARP	42	Who has 10.76.5.101? Tell 10.76…

Wireshark showing the connection used for the netcat session closing

Credits

1. Wonder HOW TO (Null Byte) - How to Use Netcat, the Swiss Army Knife of Hacking Tools

   http://null-byte.wonderhowto.com/how-to/hack-like-pro-use-netcat-swiss-army-knife-hacking-tools-0148657/

2. BinaryTides - 10 examples of Linux ss command to monitor network connections

   http://www.binarytides.com/linux-ss-command/

3. BinaryTides - 10 examples of Linux netstat command

   http://www.binarytides.com/linux-netstat-command-examples/

Activity

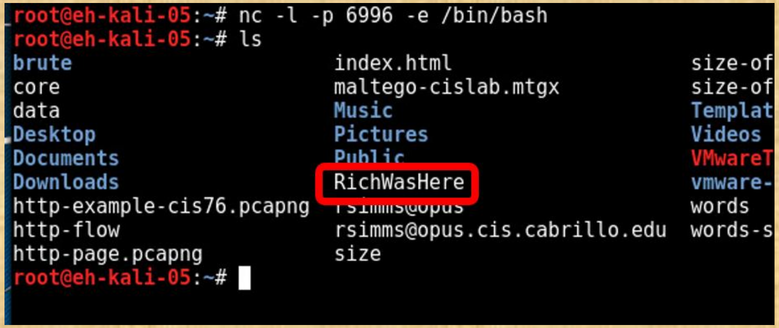
On Kali (victim)

Set up netcat (nc) as a listener on Kali

nc -l -p 6996 -e /bin/bash

In another terminal monitor connections

ss -tn



```
root@eh-kali-05:~# nc -l -p 6996 -e /bin/bash
root@eh-kali-05:~# ls
brute                      index.html                  size-of
core                       maltego-cislab.mtgx         size-of
data                       Music                       Templat
Desktop                    Pictures                    Videos
Documents                  Public                      VMwareT
Downloads                  RichWasHere                 vmware-
http-example-cis76.pcapng  rsimms@opus                 words
http-flow                  rsimms@opus.cis.cabrillo.edu  words-s
http-page.pcapng           size
root@eh-kali-05:~# 
```

Mark left by OWASP user on Kali

On OWASP (attacker)

Use netcat (nc) on OWASP to read files on Kali and leave a mark.

nc 10.76.*XX*.150 6996

In the news

Recent news

1. Reddit brings down North Korea Internet

   https://news.slashdot.org/story/16/09/21/2110242/reddit-brings-down-north-koreas-entire-internet

   Thanks Marcos

2. Half a billion Yahoo breach

   https://www.wired.com/2016/09/hack-brief-yahoo-looks-set-confirm-big-old-data-breach/

   Thanks Wes

Best Practices

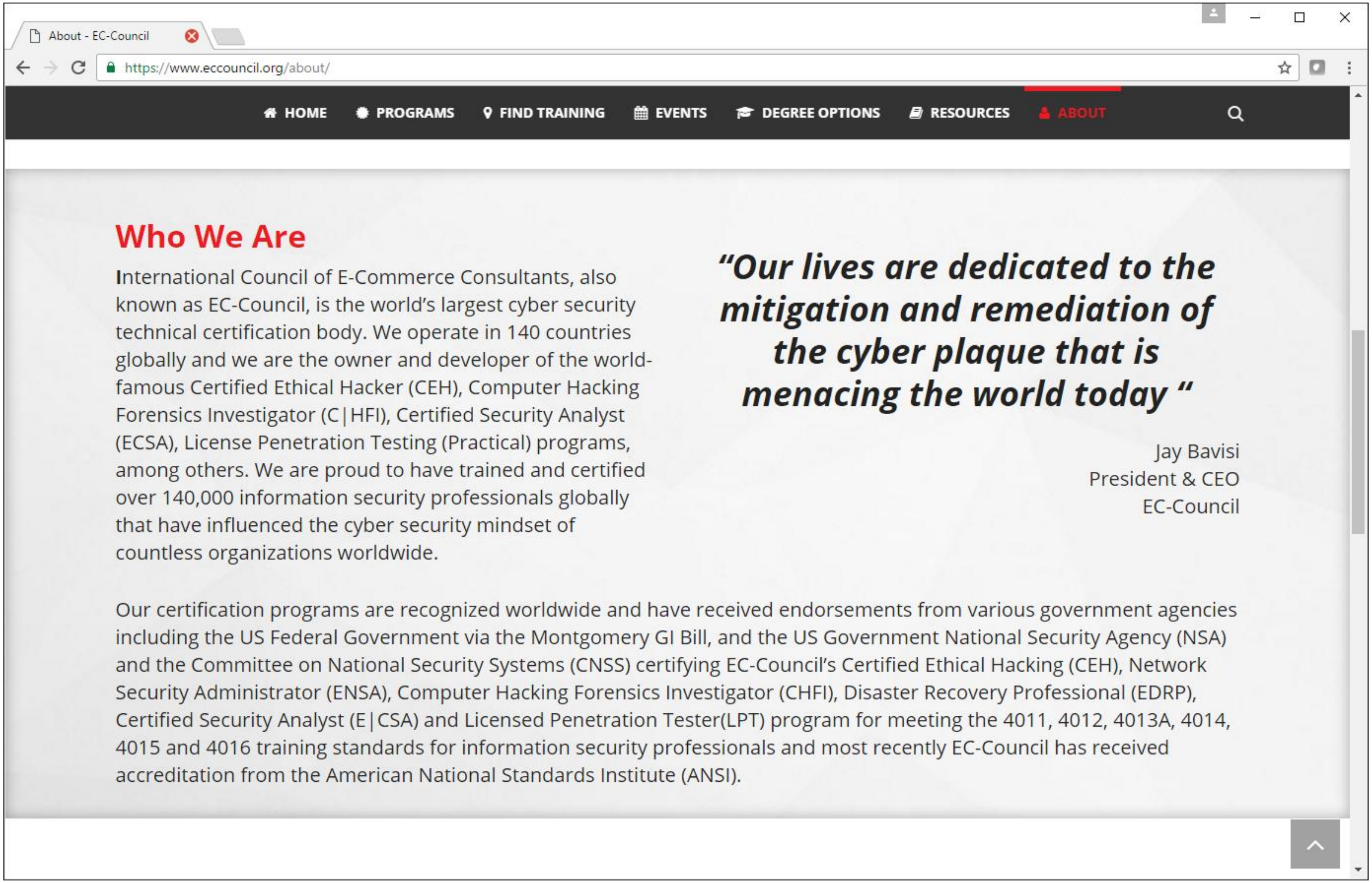
Defense Best Practices

5 simple ways you can protect yourself from phishing attacks

http://www.welivesecurity.com/2016/09/22/5-simple-ways-can-protect-phishing-attacks/?utm_source=newsletter&utm_medium=email&utm_campaign=wls-newsletter-230916

EC-Council CEH Mini Assessment

EC-Council



Who We Are

International Council of E-Commerce Consultants, also known as EC-Council, is the world's largest cyber security technical certification body. We operate in 140 countries globally and we are the owner and developer of the world-famous Certified Ethical Hacker (CEH), Computer Hacking Forensics Investigator (C|HFI), Certified Security Analyst (ECSA), License Penetration Testing (Practical) programs, among others. We are proud to have trained and certified over 140,000 information security professionals globally that have influenced the cyber security mindset of countless organizations worldwide.

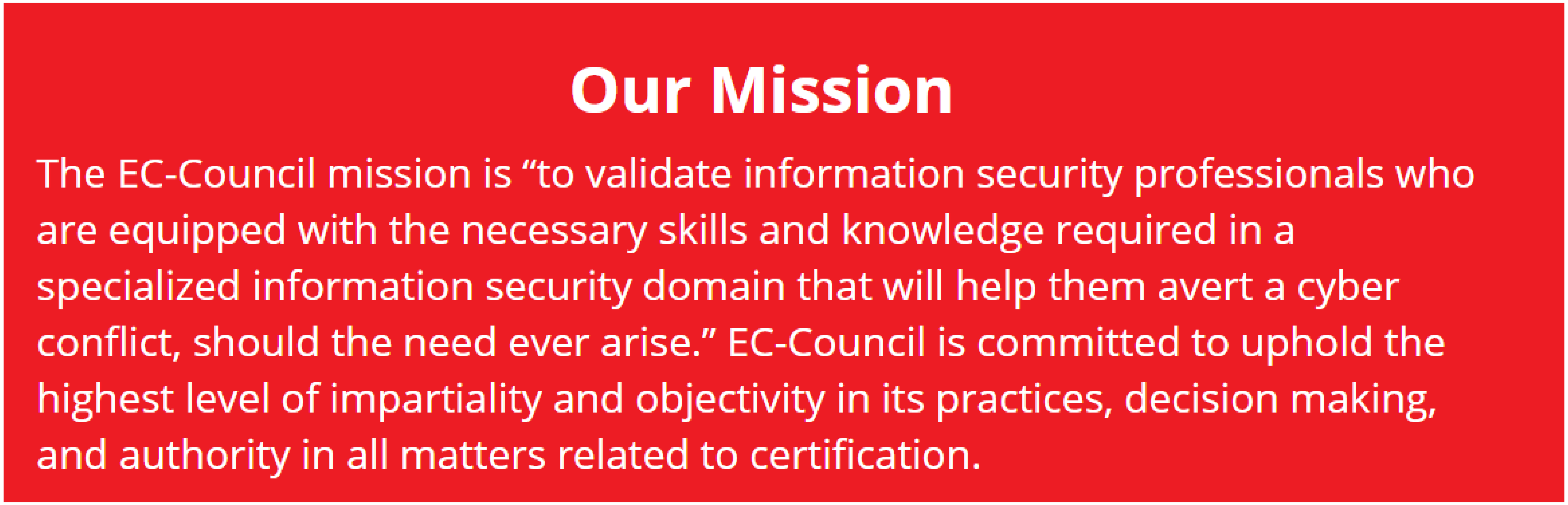
"Our lives are dedicated to the mitigation and remediation of the cyber plaque that is menacing the world today "

Jay Bavisi
President & CEO
EC-Council

Our certification programs are recognized worldwide and have received endorsements from various government agencies including the US Federal Government via the Montgomery GI Bill, and the US Government National Security Agency (NSA) and the Committee on National Security Systems (CNSS) certifying EC-Council's Certified Ethical Hacking (CEH), Network Security Administrator (ENSA), Computer Hacking Forensics Investigator (CHFI), Disaster Recovery Professional (EDRP), Certified Security Analyst (E|CSA) and Licensed Penetration Tester(LPT) program for meeting the 4011, 4012, 4013A, 4014, 4015 and 4016 training standards for information security professionals and most recently EC-Council has received accreditation from the American National Standards Institute (ANSI).

https://www.eccouncil.org/about/

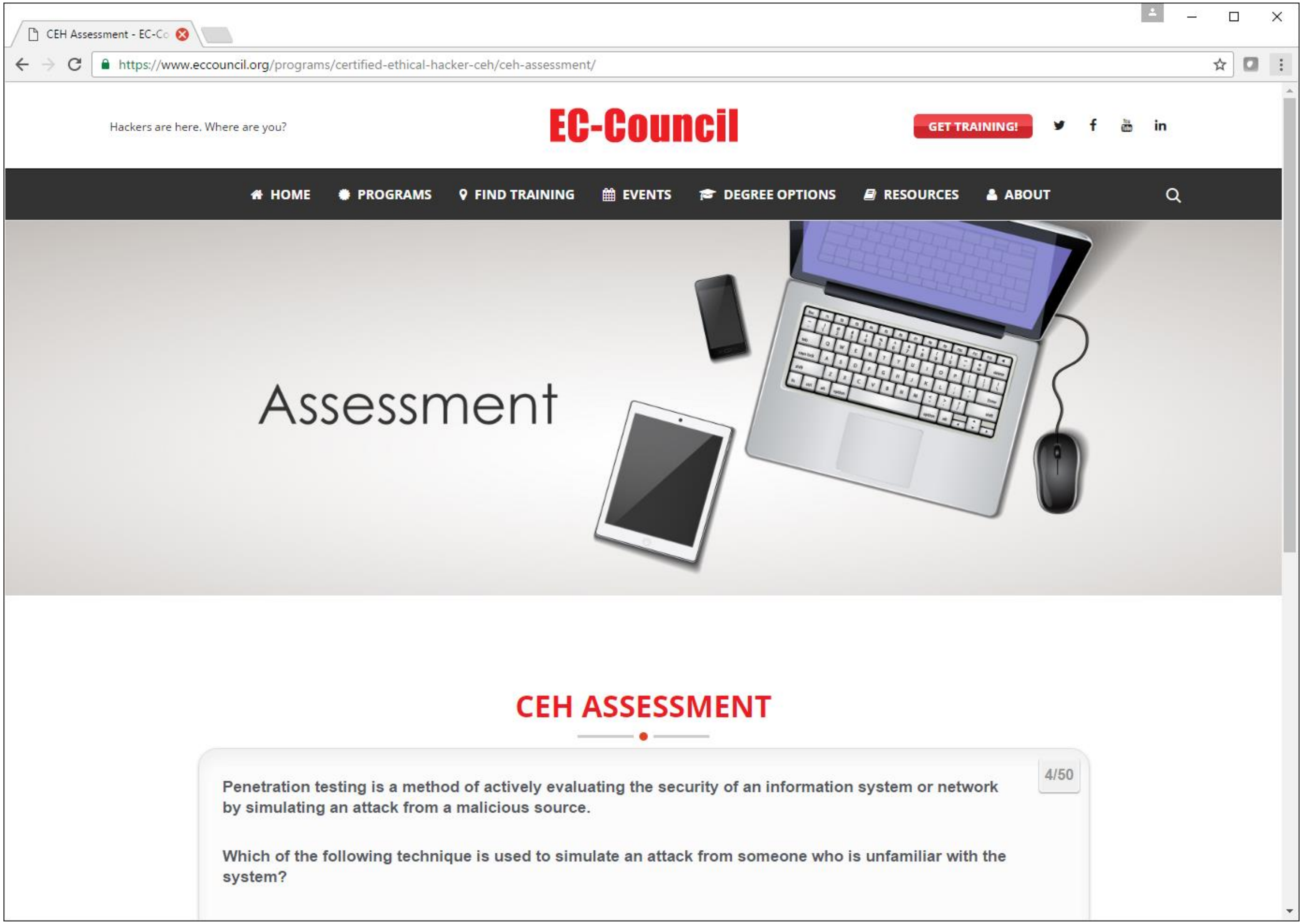
EC-Council



Our Mission

The EC-Council mission is “to validate information security professionals who are equipped with the necessary skills and knowledge required in a specialized information security domain that will help them avert a cyber conflict, should the need ever arise.” EC-Council is committed to uphold the highest level of impartiality and objectivity in its practices, decision making, and authority in all matters related to certification.

EC-Council



CEH ASSESSMENT

4/50

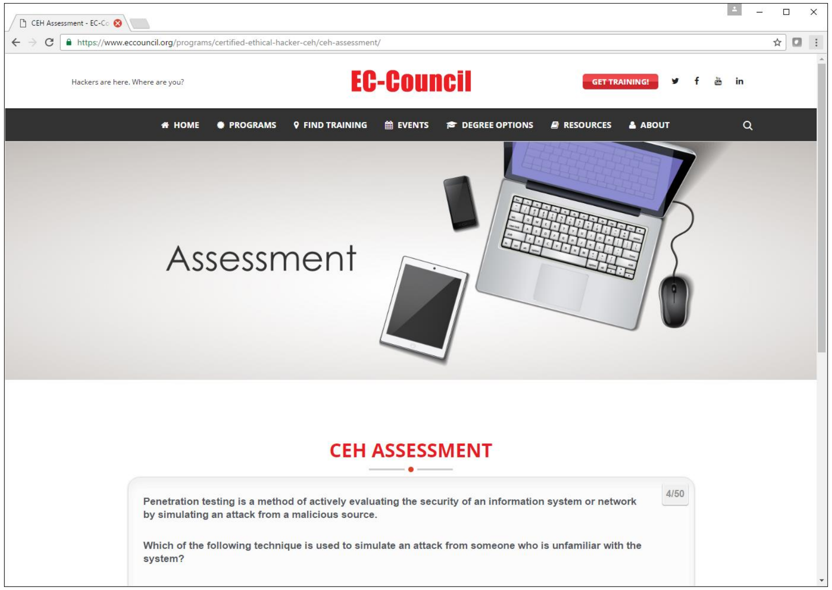
Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

Which of the following technique is used to simulate an attack from someone who is unfamiliar with the system?

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/

EC-Council Mini-Assessment Q1-10

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/

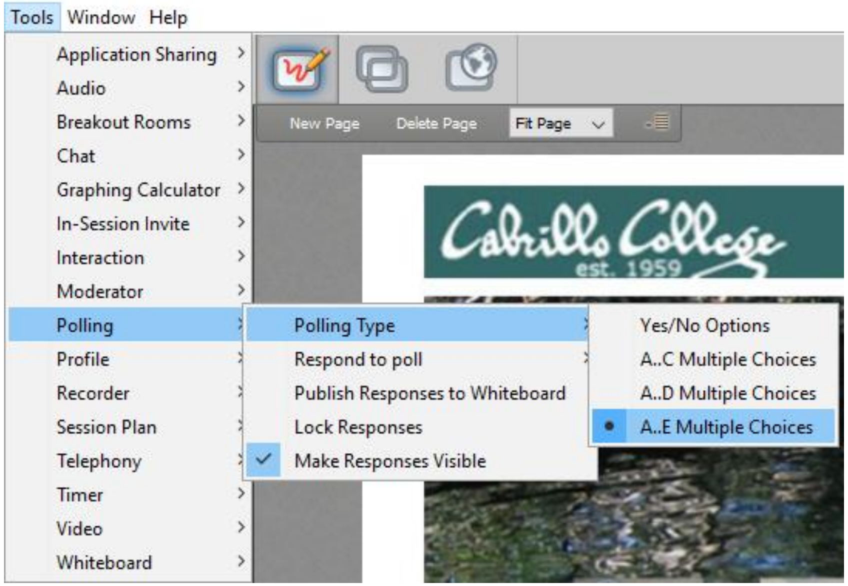


CEH ASSESSMENT

4/50

Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

Which of the following technique is used to simulate an attack from someone who is unfamiliar with the system?



Questions 1-10 (five minutes)

Housekeeping

war is not healthy for children and other living things
ICE COLD
Coffee!
You can sleep when you're dead!
LATTE
TOURIST MAP OF THE WORLD
New Z
Sports Blaster
We're Proud To Serve

Housekeeping

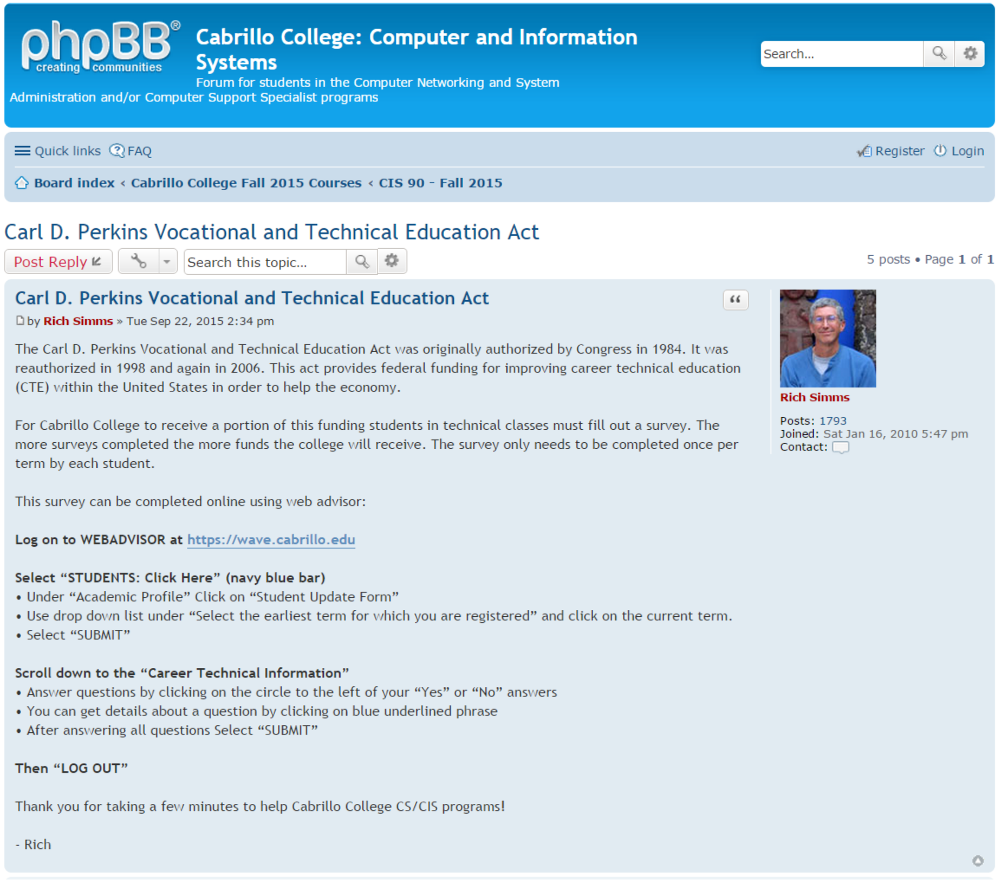
1. Still need you grading code name? Send me your student survey & agreement if you haven't already.

2. Lab 4 due by 11:59PM (Opus time) tonight. PDFs with full non-cropped screenshots are preferred.

3. First test next week!

4. Practice test available after class.

Perkins/VTEA Survey



Cabrillo College: Computer and Information Systems

Forum for students in the Computer Networking and System Administration and/or Computer Support Specialist programs

Board index ‹ Cabrillo College Fall 2015 Courses ‹ CIS 90 - Fall 2015

Carl D. Perkins Vocational and Technical Education Act

5 posts • Page **1** of **1**

Carl D. Perkins Vocational and Technical Education Act

by **Rich Simms** » Tue Sep 22, 2015 2:34 pm

The Carl D. Perkins Vocational and Technical Education Act was originally authorized by Congress in 1984. It was reauthorized in 1998 and again in 2006. This act provides federal funding for improving career technical education (CTE) within the United States in order to help the economy.

For Cabrillo College to receive a portion of this funding students in technical classes must fill out a survey. The more surveys completed the more funds the college will receive. The survey only needs to be completed once per term by each student.

This survey can be completed online using web advisor:

Log on to WEBADVISOR at https://wave.cabrillo.edu

Select "STUDENTS: Click Here" (navy blue bar)
- Under "Academic Profile" Click on "Student Update Form"
- Use drop down list under "Select the earliest term for which you are registered" and click on the current term.
- Select "SUBMIT"

Scroll down to the "Career Technical Information"
- Answer questions by clicking on the circle to the left of your "Yes" or "No" answers
- You can get details about a question by clicking on blue underlined phrase
- After answering all questions Select "SUBMIT"

Then "LOG OUT"

Thank you for taking a few minutes to help Cabrillo College CS/CIS programs!

- Rich

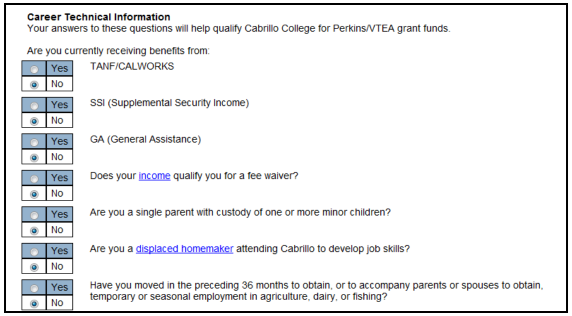
Rich Simms

Posts: 1793
Joined: Sat Jan 16, 2010 5:47 pm
Contact:

http://oslab.cis.cabrillo.edu/forum/viewtopic.php?f=121&t=4176

This is an important source of funding for Cabrillo College.

Send me an email stating you completed this Perkins/VTEA survey for ***three points extra credit!***



Career Technical Information
Your answers to these questions will help qualify Cabrillo College for Perkins/VTEA grant funds.

Are you currently receiving benefits from:

○ Yes ● No TANF/CALWORKS

○ Yes ● No SSI (Supplemental Security Income)

○ Yes ● No GA (General Assistance)

○ Yes ● No Does your income qualify you for a fee waiver?

○ Yes ● No Are you a single parent with custody of one or more minor children?

○ Yes ● No Are you a displaced homemaker attending Cabrillo to develop job skills?

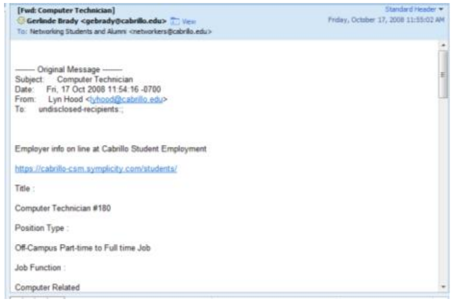
○ Yes ● No Have you moved in the preceding 36 months to obtain, or to accompany parents or spouses to obtain, temporary or seasonal employment in agriculture, dairy, or fishing?

Cabrillo Networking Program Mailing list

Subscribe by sending an email (no subject or body) to:

networkers-subscribe@cabrillo.edu

- Program information
- Certification information
- Career and job information
- Short-term classes, events, lectures, tours, etc.
- Surveys
- Networking info and links



[Fwd: Computer Technician]
Gerlinde Brady <gebrady@cabrillo.edu>
To: Networking Students and Alumni <networkers@cabrillo.edu>
Friday, October 17, 2008 11:55:02 AM

```
-------- Original Message --------
Subject:    Computer Technician
Date:    Fri, 17 Oct 2008 11:54:16 -0700
From:    Lyn Hood <lyhood@cabrillo.edu>
To:    undisclosed-recipients:;
```

Employer info on line at Cabrillo Student Employment

https://cabrillo-csm.symplicity.com/students/

Title :

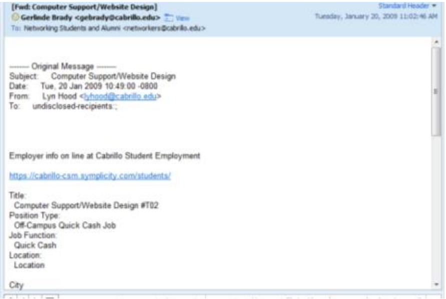
Computer Technician #180

Position Type :

Off-Campus Part-time to Full time Job

Job Function :

Computer Related



[Fwd: Computer Support/Website Design]
Gerlinde Brady <gebrady@cabrillo.edu>
To: Networking Students and Alumni <networkers@cabrillo.edu>
Tuesday, January 20, 2009 11:02:46 AM

```
-------- Original Message --------
Subject:    Computer Support/Website Design
Date:    Tue, 20 Jan 2009 10:49:00 -0800
From:    Lyn Hood <lyhood@cabrillo.edu>
To:    undisclosed-recipients:;
```

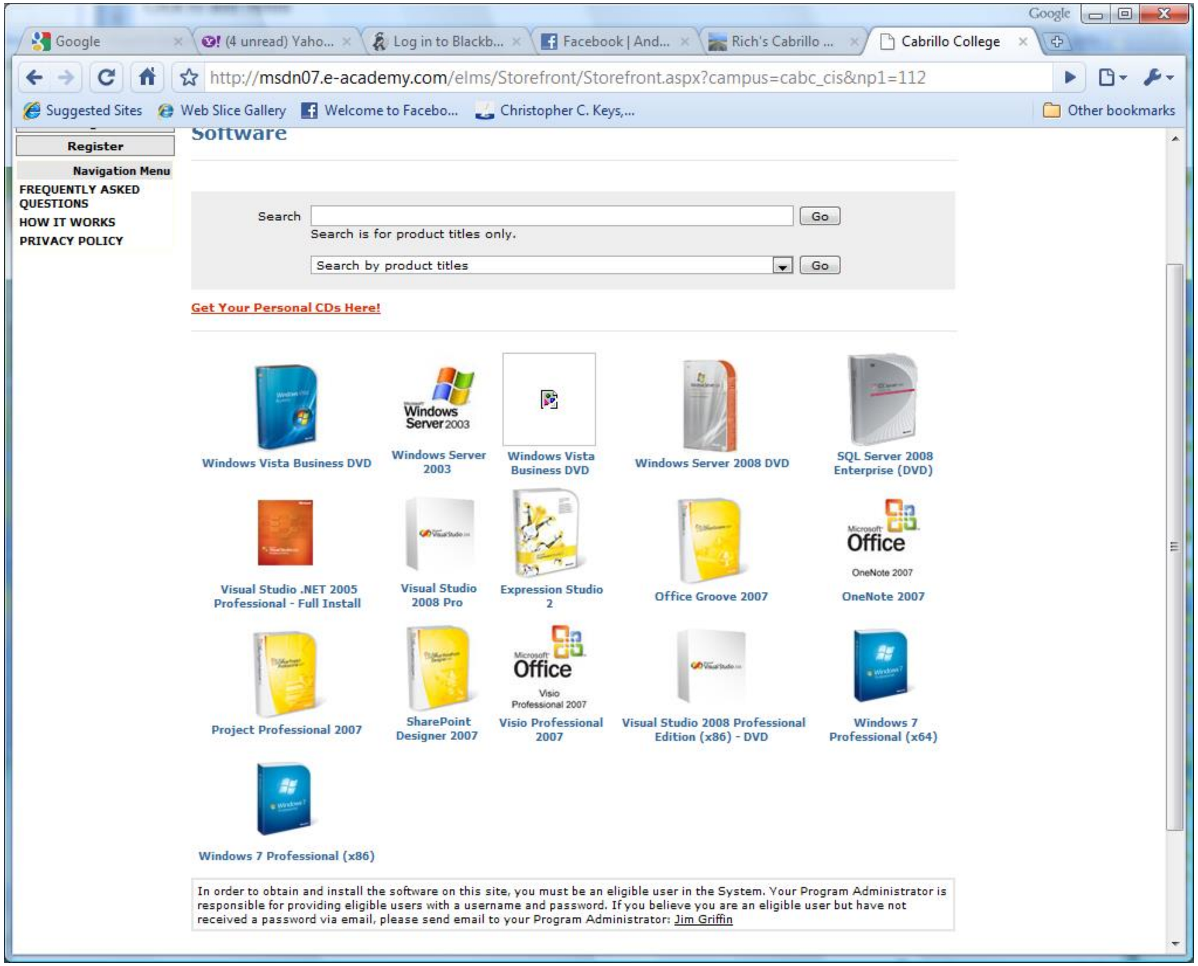
Employer info on line at Cabrillo Student Employment

https://cabrillo-csm.symplicity.com/students/

Title:
  Computer Support/Website Design #T02
Position Type:
  Off-Campus Quick Cash Job
Job Function:
  Quick Cash
Location:
  Location

City

Microsoft Academic Webstore



http://msdn07.e-academy.com/elms/Storefront/Storefront.aspx?campus=cabc_cis&np1=112

Search is for product titles only.

Get Your Personal CDs Here!

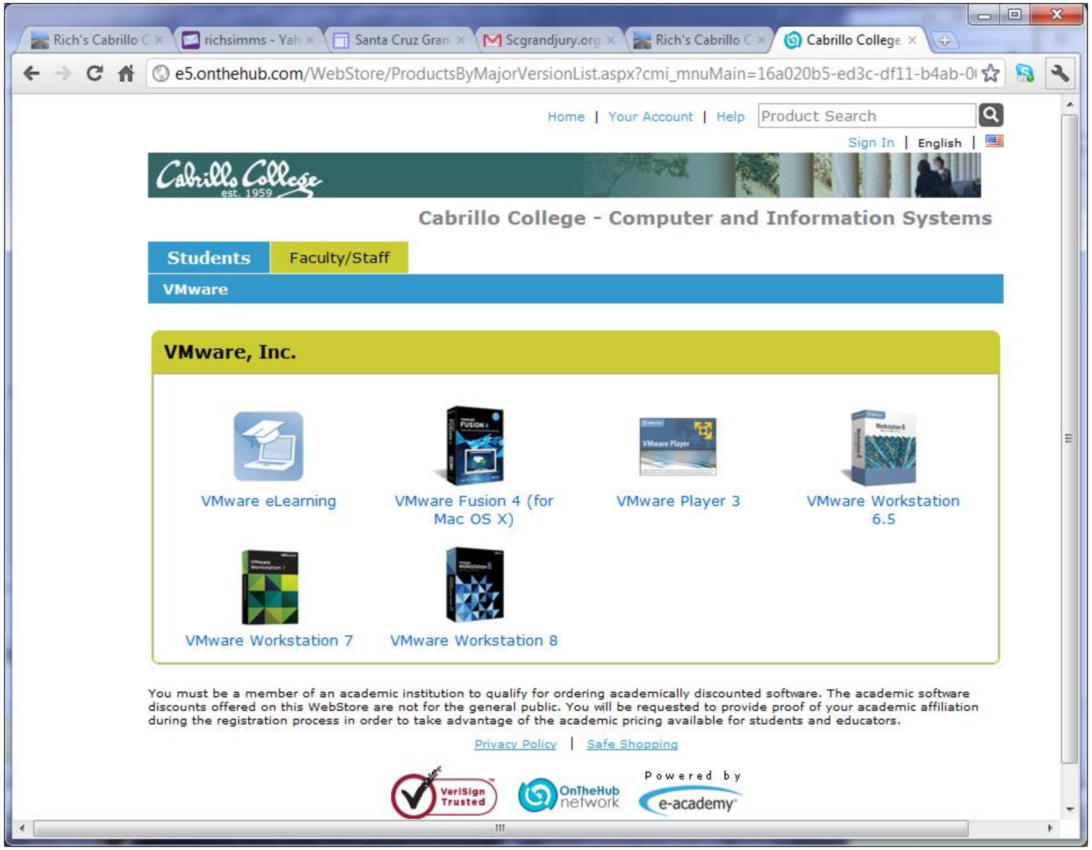
In order to obtain and install the software on this site, you must be an eligible user in the System. Your Program Administrator is responsible for providing eligible users with a username and password. If you believe you are an eligible user but have not received a password via email, please send email to your Program Administrator: Jim Griffin

- Microsoft software for students registered in a CIS or CS class at Cabrillo

- Available after registration is final (two weeks after first class)

To get to this page, go to **http://simms-teach.com/resources** and click on the appropriate link in the Tools and Software section

VMware Academic Webstore



You must be a member of an academic institution to qualify for ordering academically discounted software. The academic software discounts offered on this WebStore are not for the general public. You will be requested to provide proof of your academic affiliation during the registration process in order to take advantage of the academic pricing available for students and educators.

- VMware software for students registered in a CIS or CS class at Cabrillo

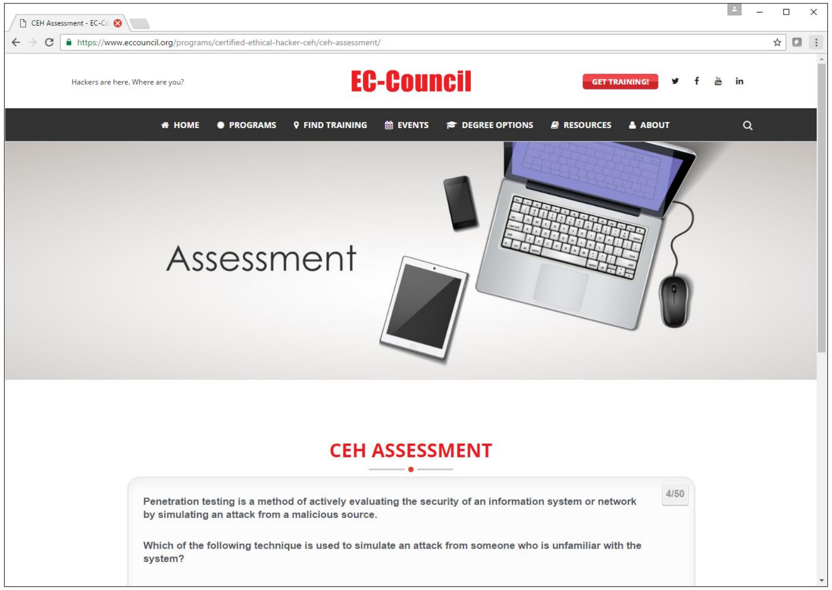
- Available after registration is final (two weeks after first class)

To get to this page, go to **http://simms-teach.com/resources** and click on the appropriate link in the Tools and Software section

Don't forget to change your default password on Opus

EC-Council Mini-Assessment Q11-20

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/



Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

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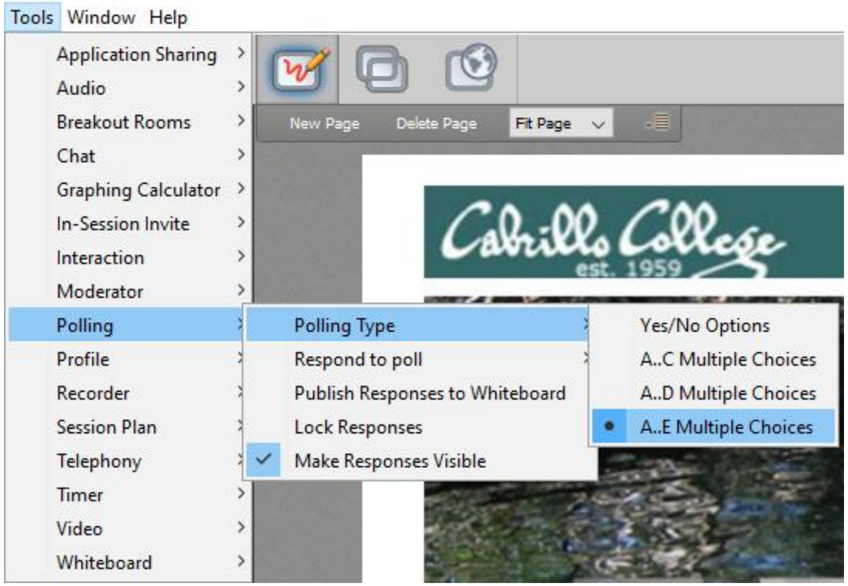
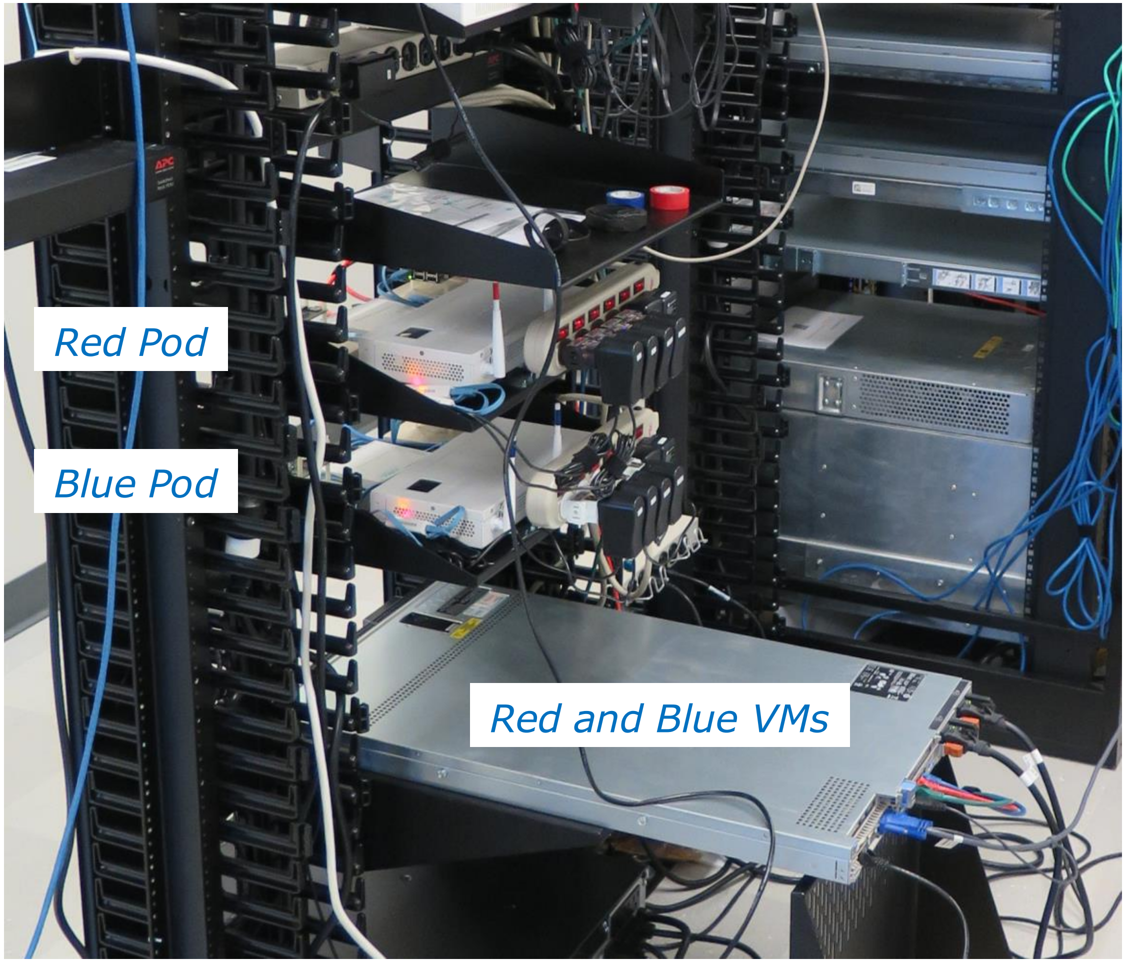


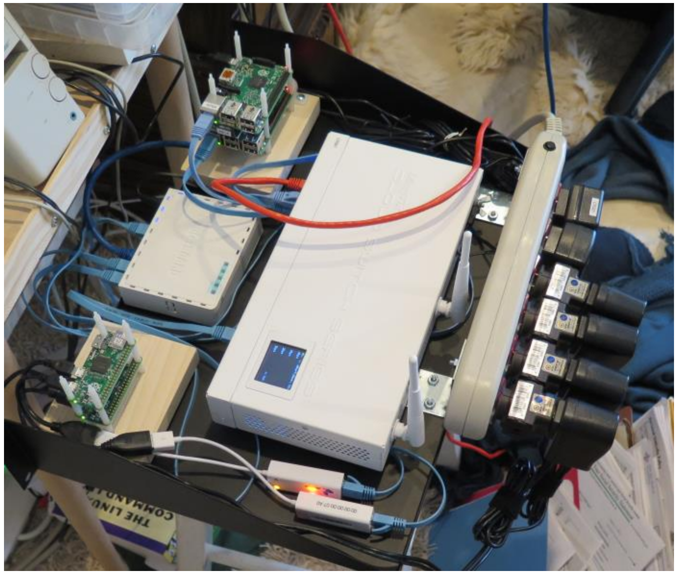
Questions 11-20 (five minutes)

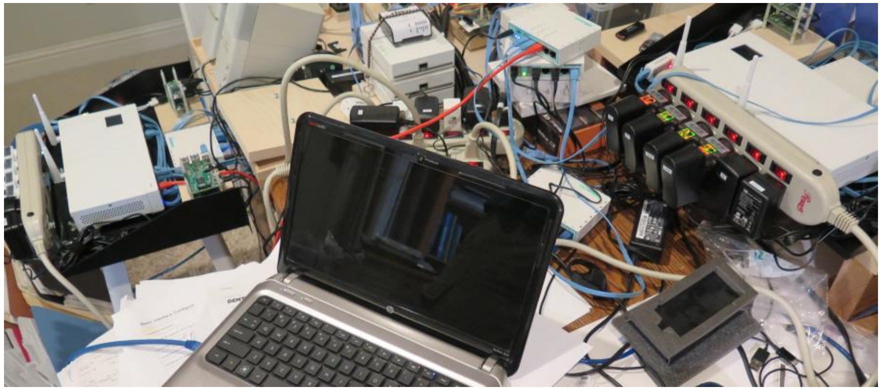
Red and Blue Pods

Red and Blue Pods in Microlab Lab Rack

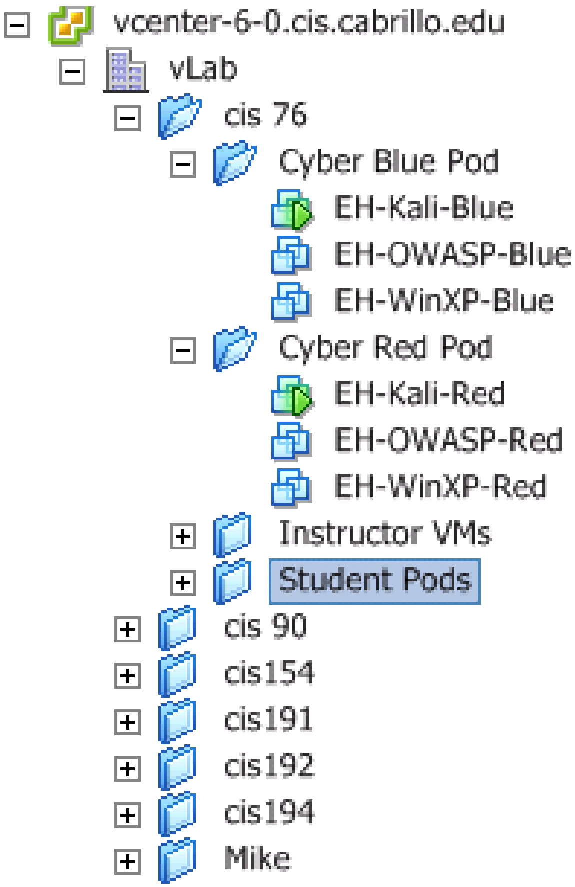


Building Red and Blue Pods at Home





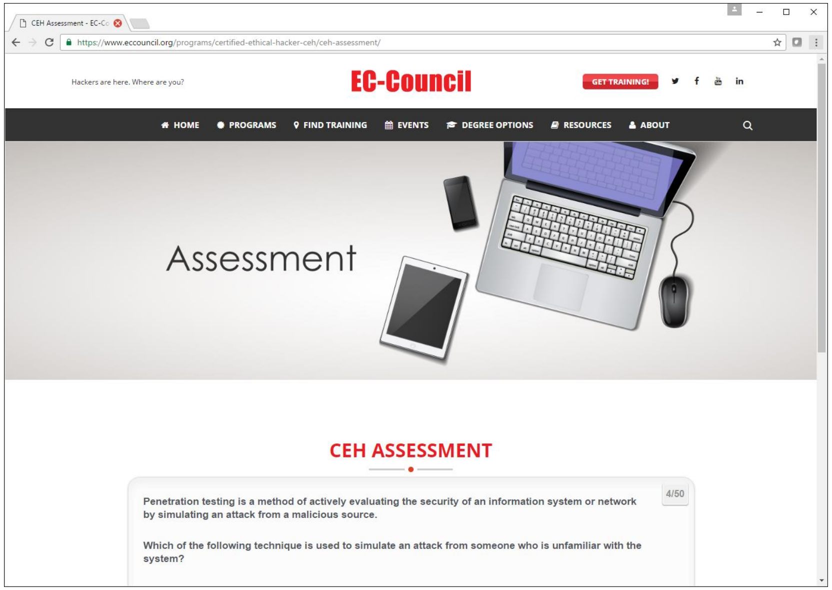
Accessing Red and Blue Pods via VLab



```
⊟ vcenter-6-0.cis.cabrillo.edu
  ⊟ vLab
    ⊟ cis 76
      ⊟ Cyber Blue Pod
          EH-Kali-Blue
          EH-OWASP-Blue
          EH-WinXP-Blue
      ⊟ Cyber Red Pod
          EH-Kali-Red
          EH-OWASP-Red
          EH-WinXP-Red
      ⊞ Instructor VMs
      ⊞ Student Pods
    ⊞ cis 90
    ⊞ cis154
    ⊞ cis191
    ⊞ cis192
    ⊞ cis194
    ⊞ Mike
```

EC-Council Mini-Assessment Q21-30

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/

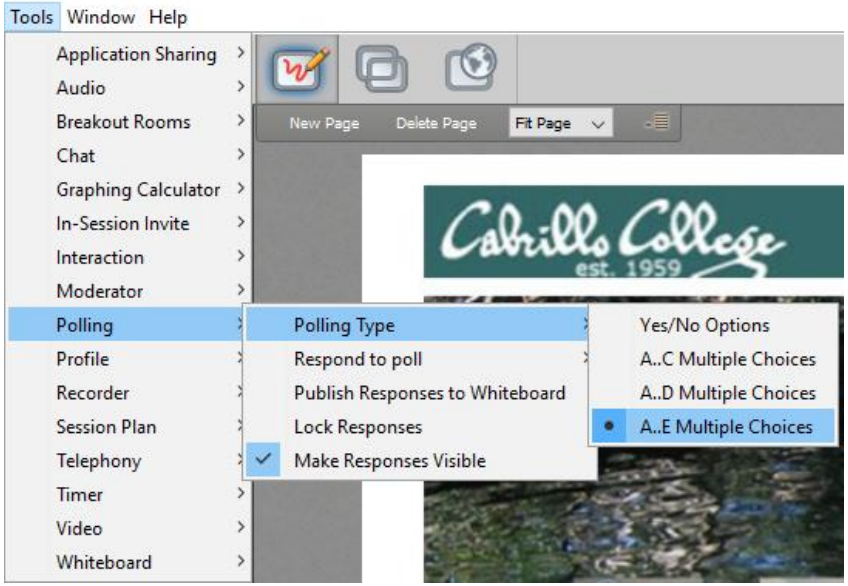


CEH ASSESSMENT

4/50

Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

Which of the following technique is used to simulate an attack from someone who is unfamiliar with the system?



Questions 21-30 (five minutes)

Domain 1

NISGTC
The National Information, Security & Geospatial Technologies Consortium

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Domain 1

Introduction to Ethical Hacking

NISGTC

The National Information, Security & Geospatial Technologies Consortium

Objectives

- Describe the five phases of ethical hacking
- Describe the different types of hacker attacks
- Describe hactivism
- Understand the scope and limitations of ethical hacking
- Understand vulnerability research and list the various vulnerability research tools
- Learn the different ways an ethical hacker tests a target network

Introduction to Ethical Hacking

Information assets need to be secured

Assumptions

- Upper management understands the need for security
- A Security Policy is in place specifying how objects in a security domain are allowed to interact

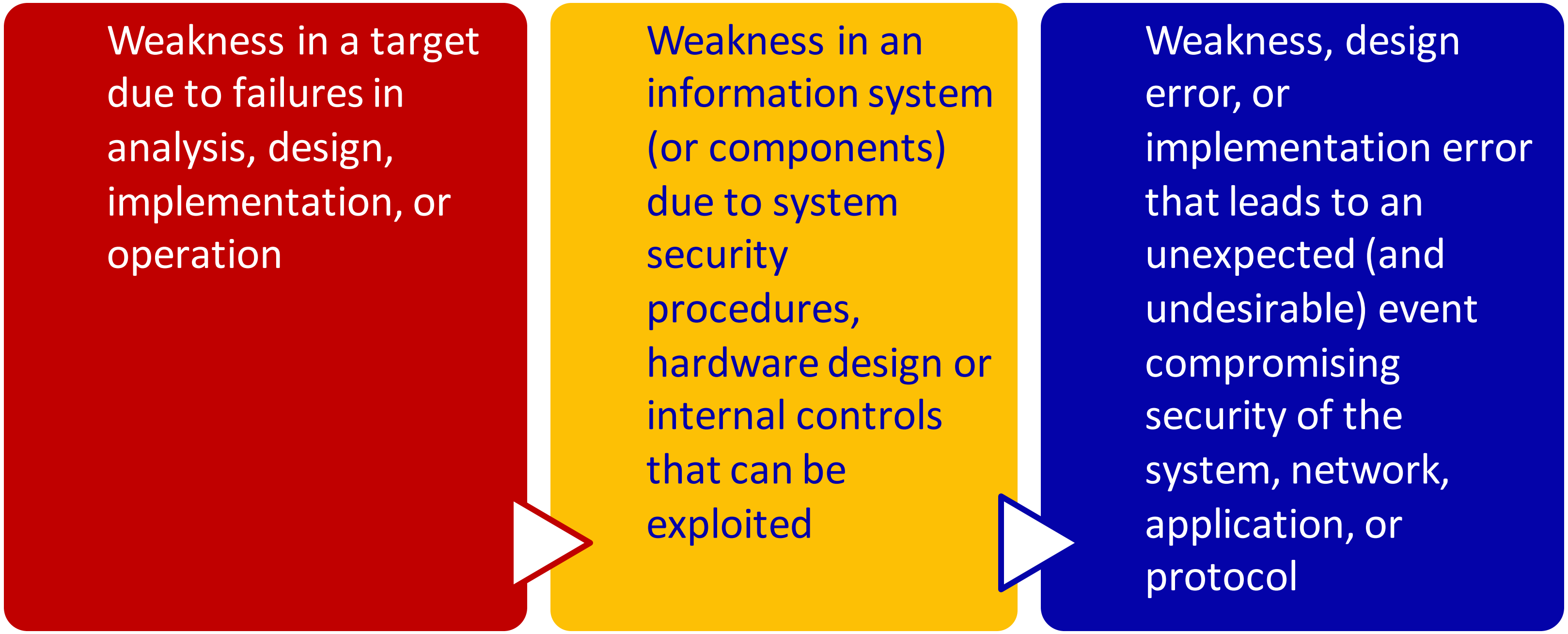
Challenge

Guard the infrastructure against exploits by being aware of those who seek to use that same infrastructure for their own purposes

Solution

- Hire an ethical hacker with the skills of a malicious hacker

Vulnerability



Weakness in a target due to failures in analysis, design, implementation, or operation

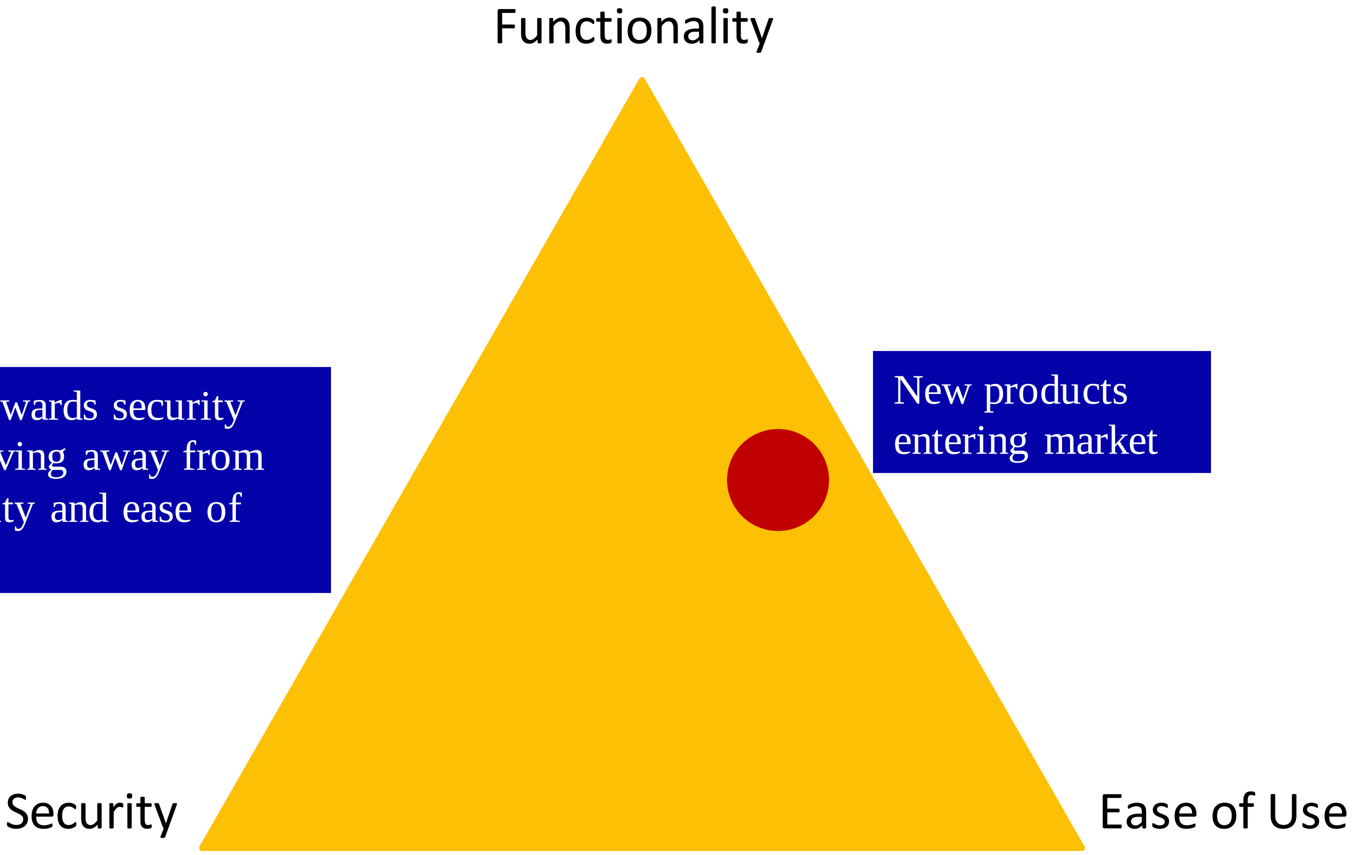
Weakness in an information system (or components) due to system security procedures, hardware design or internal controls that can be exploited

Weakness, design error, or implementation error that leads to an unexpected (and undesirable) event compromising security of the system, network, application, or protocol

Attack

- The deliberate assault on the security of a system
- Active versus passive attacks
  - ✓ Active attacks modify a target system affecting the confidentiality, integrity, and availability (alters)
  - ✓ Passive attacks violate the confidentiality of a system's data without affecting the state of the system (learns)
- Inside versus outside attacks
  - ✓ Inside attacks is initiated from within a network by an authorized user
  - ✓ Outside attacks initiated by an intruder without authorization to the network

Security versus Functionality and Ease of Use



Moving towards security means moving away from functionality and ease of use

New products entering market

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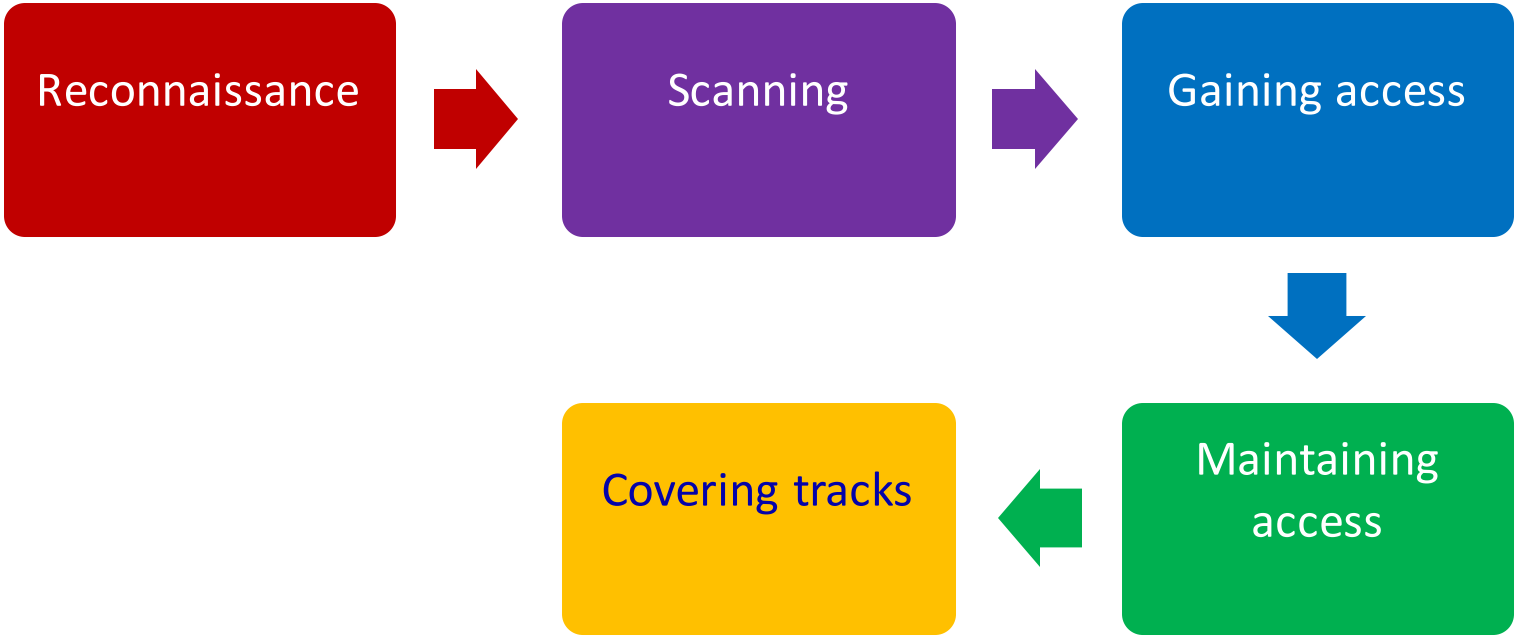
Phases of an Attack



Reconnaissance

Scanning

Gaining access

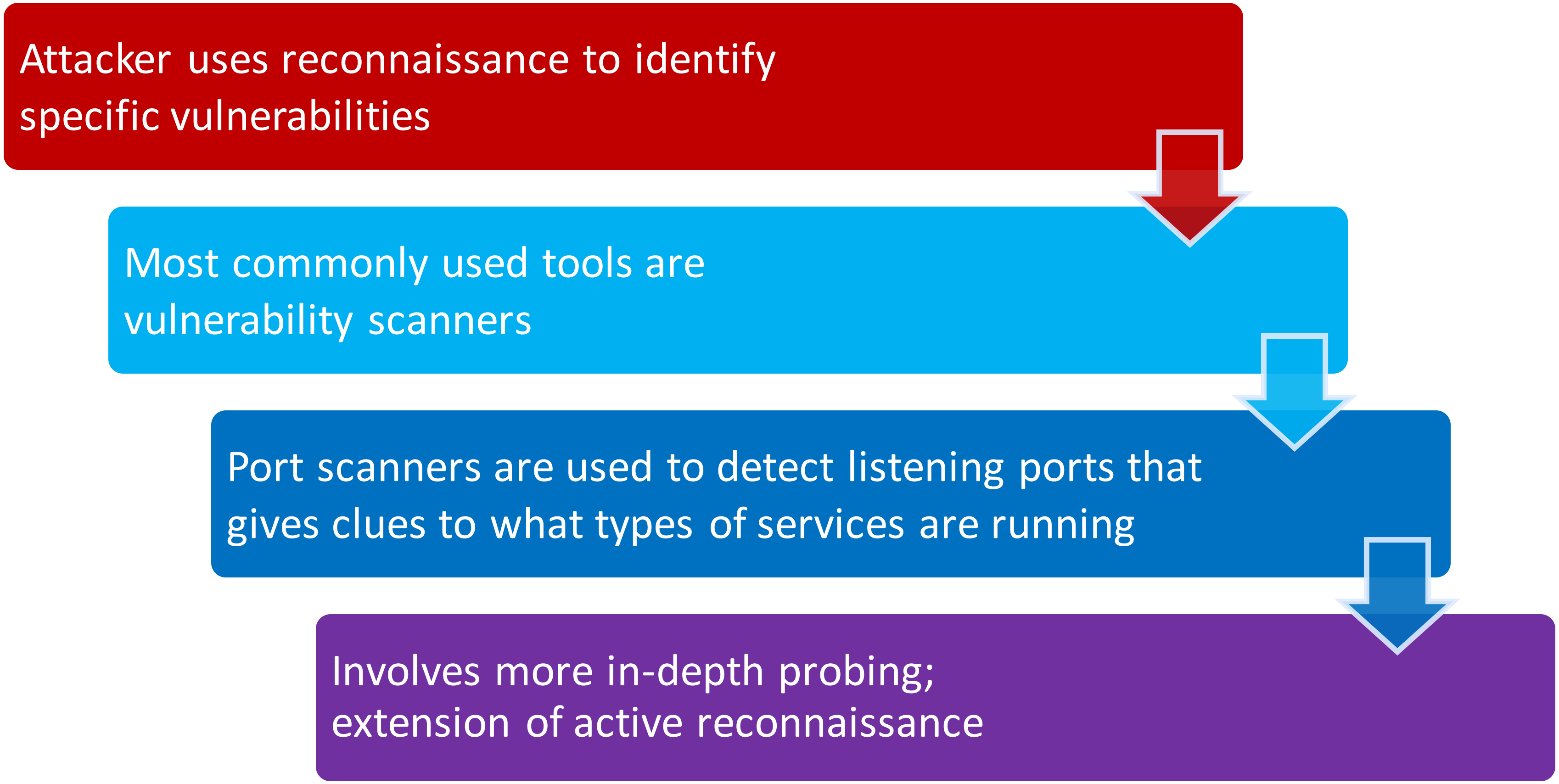
Maintaining access

Covering tracks

Reconnaissance

- The planning phase
- Attacker gathers as much information as possible about the target
- Reconnaissance types
  - ✓ Passive – attacker does not interact with the system directly
    - Social engineering
    - Dumpster diving
  - ✓ Active – attacker uses tools
    - Detects open ports
    - Router locations
    - Network mapping
    - Operating system details

Scanning



Attacker uses reconnaissance to identify specific vulnerabilities

Most commonly used tools are vulnerability scanners

Port scanners are used to detect listening ports that gives clues to what types of services are running

Involves more in-depth probing; extension of active reconnaissance

Gaining Access

Gain access locally, offline, over a network, or over the Internet

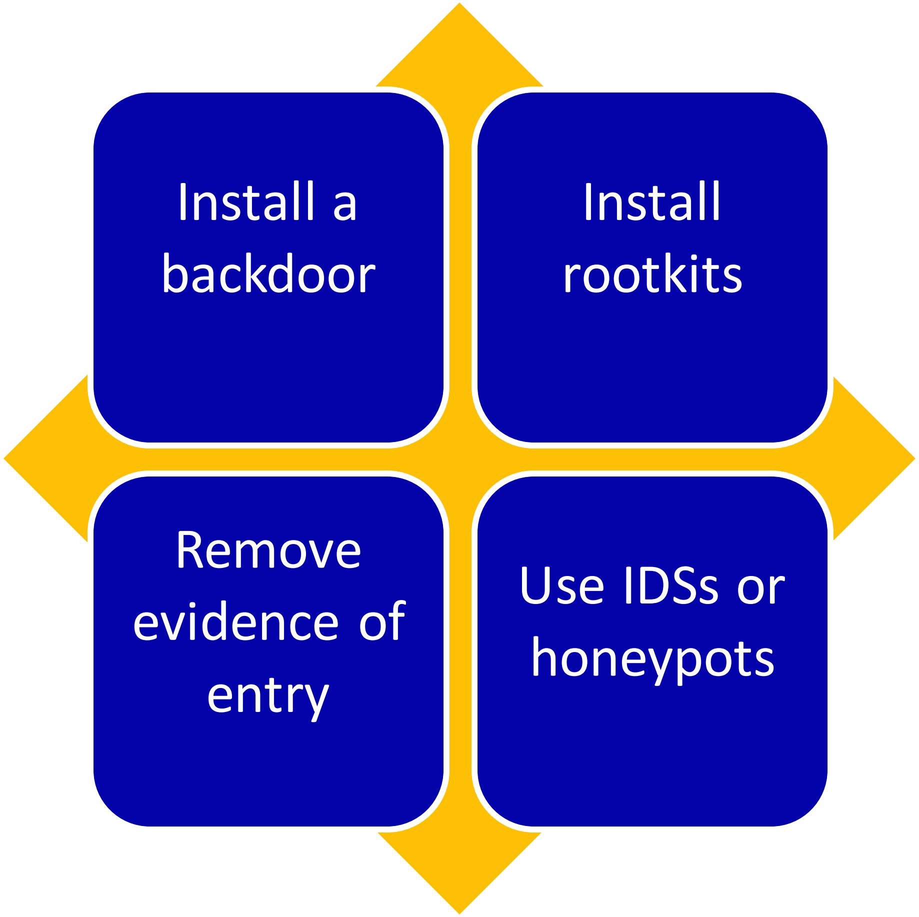
Factors affecting the hacker’s success

Architecture and configuration of the target system

Skill level

- Level of access obtained

Maintaining Access


Install a backdoor

Install rootkits

Remove evidence of entry

Use IDSs or honeypots

Covering Tracks

- Erase all evidence
- ps or netcat are Trojans used to erase the attacker’s actions from log files
- Steganography and tunneling can also be used
  - ✓ Steganography – hiding data in other data
  - ✓ Tunneling – carrying one protocol in another
- Host-based intrusion detection and anti-virus used for detection

I don't see Steganography in our textbook.

No problem.

Types of Hacker Attacks

Operating system attacks

Increasing features increases complexity

Application-level attacks

Security not always a priority for software developers

Shrink-wrap code attacks

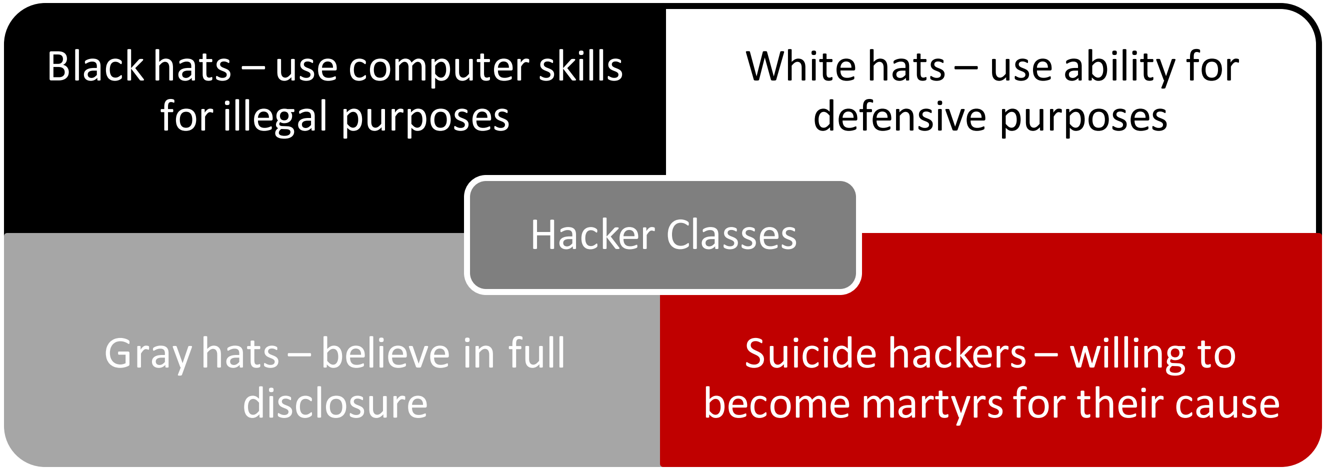
Developers use free libraries and code licensed from other sources

Mis-configuration attacks

Create a simple configuration removing all unnecessary services and software

Hacktivism

- Combines hack with activism
- Use hacking to increase awareness of a social or political agenda
- Targets include government agencies and multinational corporations



Black hats – use computer skills for illegal purposes

White hats – use ability for defensive purposes

Hacker Classes

Gray hats – believe in full disclosure

Suicide hackers – willing to become martyrs for their cause

Ethical Hackers

- Hired to evaluate and defend against threats
- Seeks answers to three basic questions
  - ✓ What can an attacker see on a target?
  - ✓ What can an attacker do with that information?
  - ✓ Are the attackers' attempts being noticed on the target?
- Employ the same tools and techniques as attackers
- Skills required
  - ✓ Detailed knowledge of both hardware and software
  - ✓ Strong grasp on networking and programming
  - ✓ Knowledge of the installation and maintenance of multiple operating systems

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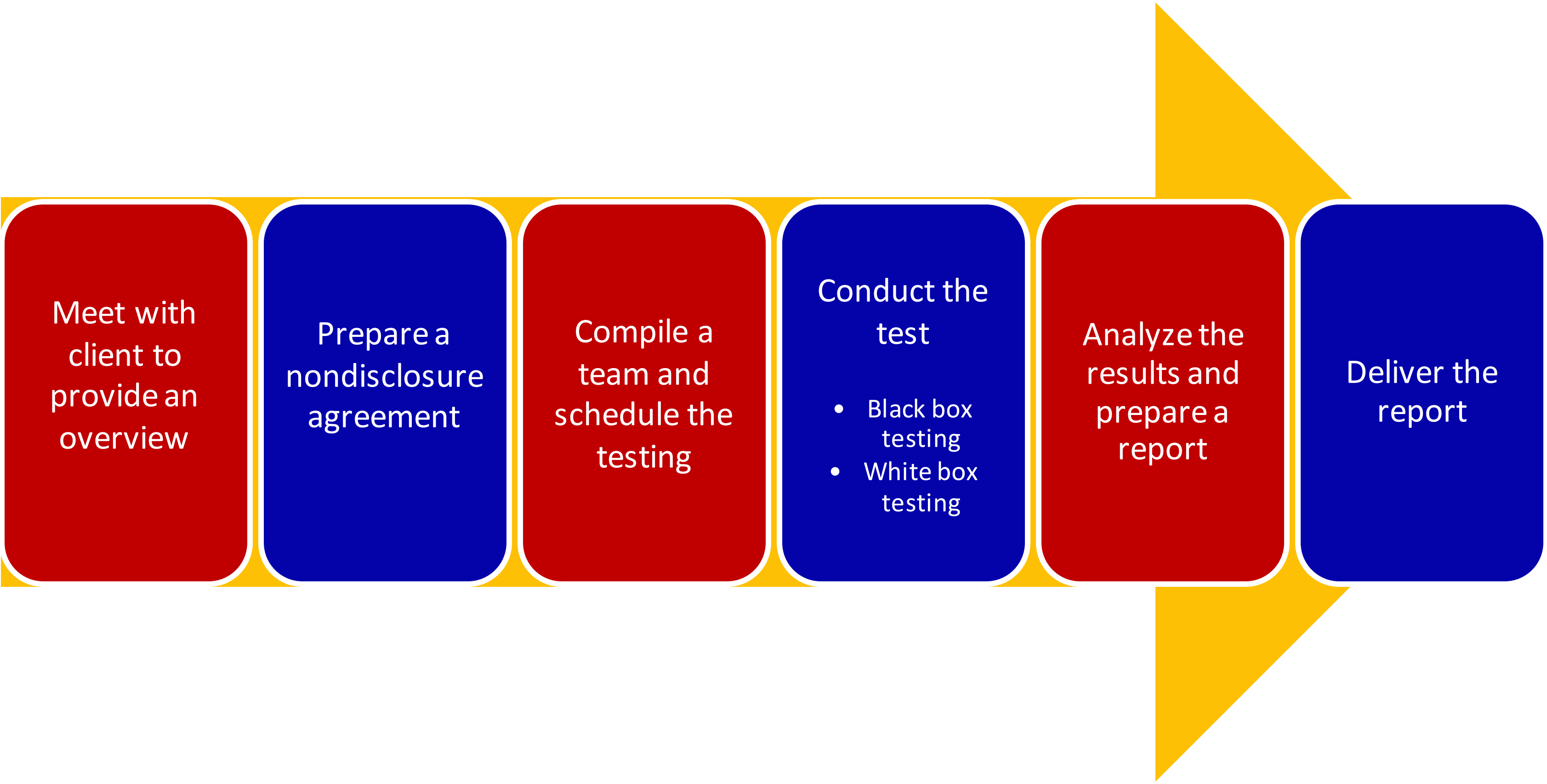
Vulnerability Research

- Discovering system design faults and weaknesses
- Keeping up-to-date on new products and technologies
- Monitoring underground hacking web sites
- Checking newly released alerts
- Consulting useful web sites
  - ✓ US-CERT: www.us-cert.gov
  - ✓ National Vulnerability Database: nvd.nist.gov
  - ✓ What other web site can you find?

Ethical Hacking Assignment


Meet with client to provide an overview
Prepare a nondisclosure agreement
Compile a team and schedule the testing
Conduct the test
Black box testing
White box testing
Analyze the results and prepare a report
Deliver the report

Computer Crime

Categories

- Crimes facilitated by the use of a computer
- Crimes where the computer is the target

Laws and Acts

- Cyber Security Enhancement Act

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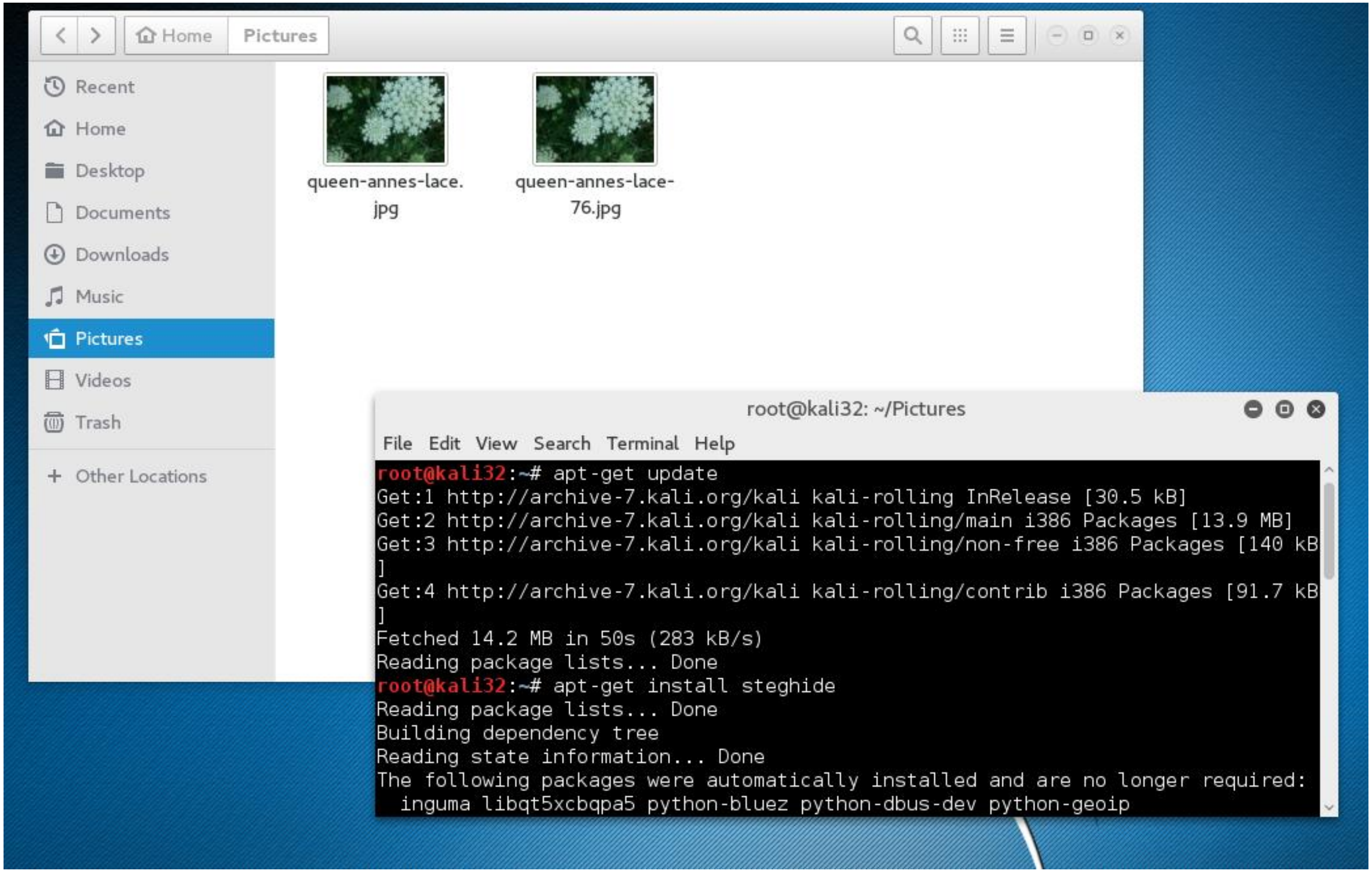
Steganography

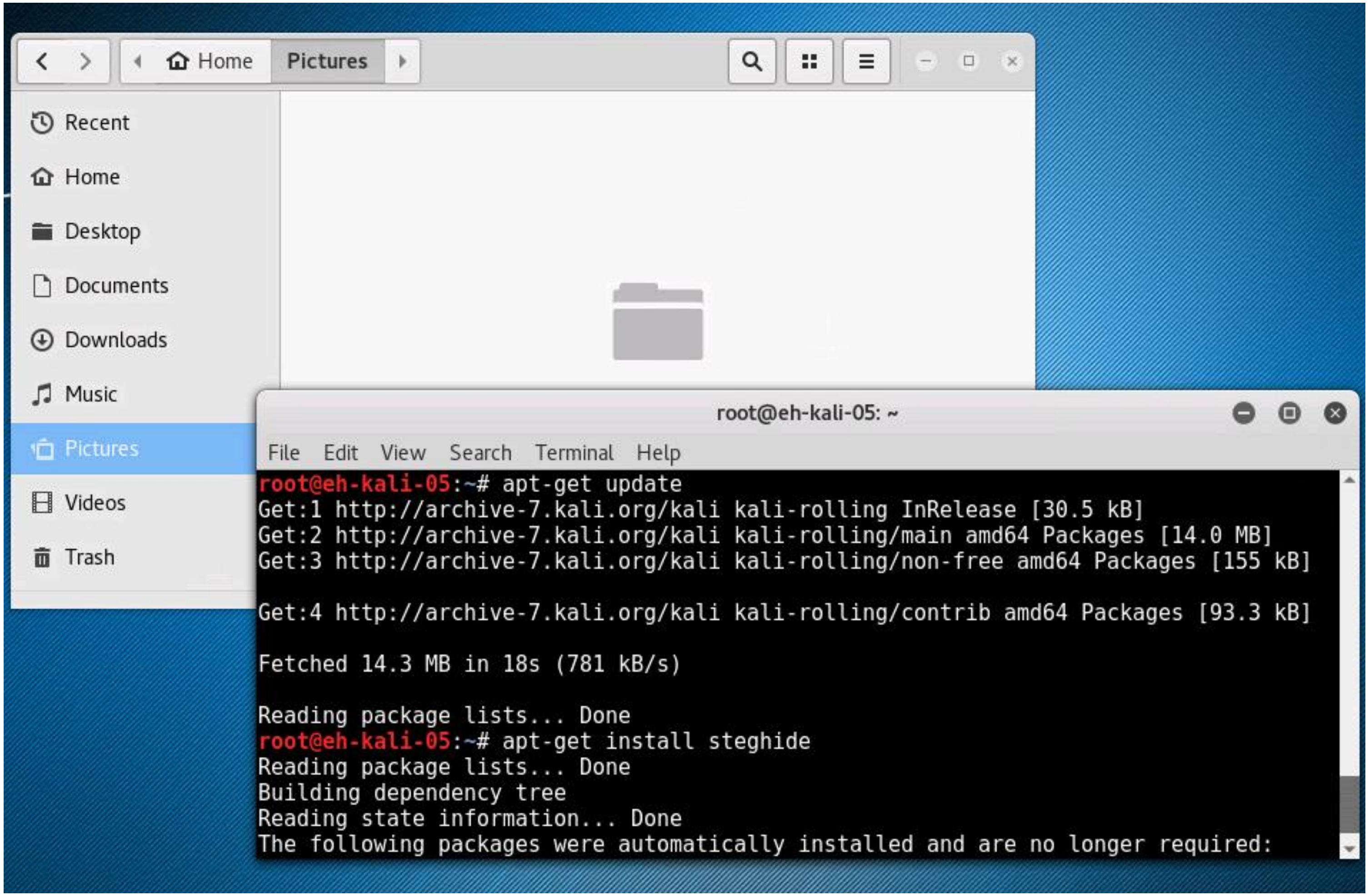
Installing steghide on Kali (at home)



```
root@kali32:~# apt-get update
Get:1 http://archive-7.kali.org/kali kali-rolling InRelease [30.5 kB]
Get:2 http://archive-7.kali.org/kali kali-rolling/main i386 Packages [13.9 MB]
Get:3 http://archive-7.kali.org/kali kali-rolling/non-free i386 Packages [140 kB
]
Get:4 http://archive-7.kali.org/kali kali-rolling/contrib i386 Packages [91.7 kB
]
Fetched 14.2 MB in 50s (283 kB/s)
Reading package lists... Done
root@kali32:~# apt-get install steghide
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  inguma libqt5xcbqpa5 python-bluez python-dbus-dev python-geoip
```

```
apt-get update
apt-get install steghide
```

Installing steghide on Kali (in EH-Pod)



```
root@eh-kali-05:~# apt-get update
Get:1 http://archive-7.kali.org/kali kali-rolling InRelease [30.5 kB]
Get:2 http://archive-7.kali.org/kali kali-rolling/main amd64 Packages [14.0 MB]
Get:3 http://archive-7.kali.org/kali kali-rolling/non-free amd64 Packages [155 kB]

Get:4 http://archive-7.kali.org/kali kali-rolling/contrib amd64 Packages [93.3 kB]

Fetched 14.3 MB in 18s (781 kB/s)

Reading package lists... Done
root@eh-kali-05:~# apt-get install steghide
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
```

```
apt-get update
apt-get install steghide
```

steghide command syntax

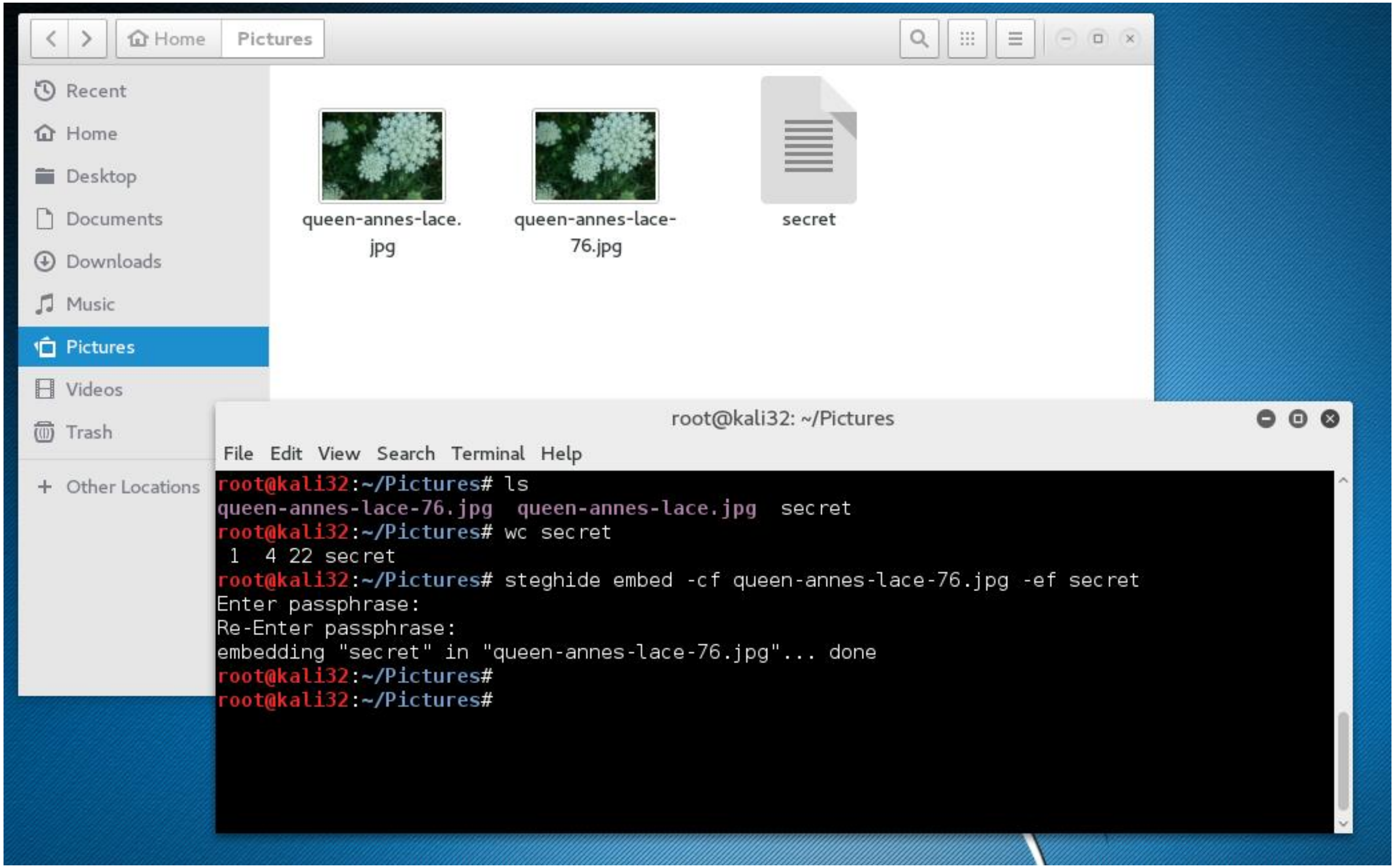
Embed a secret file in a picture

steghide embed -cf <cover-file> **-ef** *<embedded-file>*

Extract the secret file

steghide extract -sf *<stego-file>*

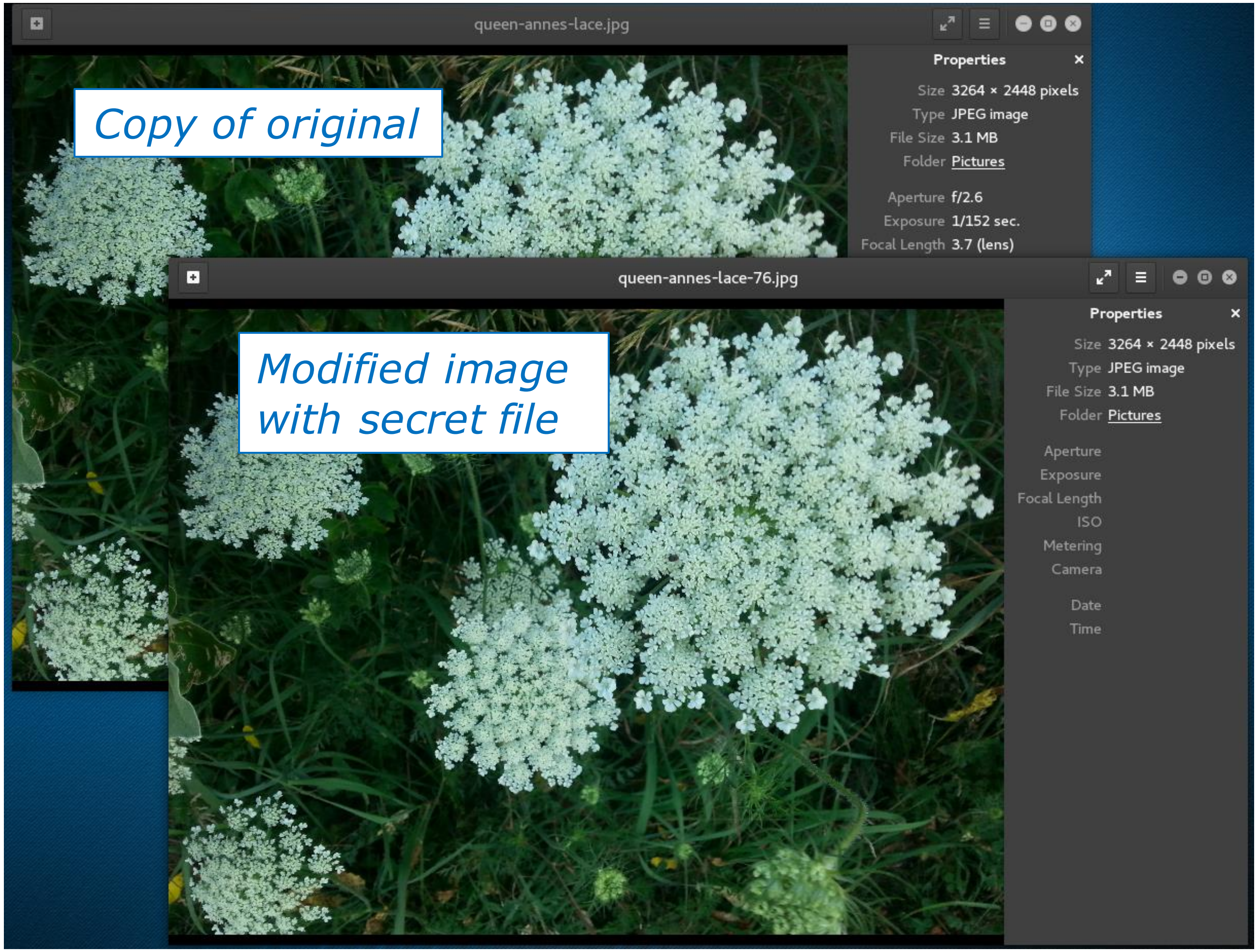
Embed secret file into image



```
root@kali32:~/Pictures# ls
queen-annes-lace-76.jpg  queen-annes-lace.jpg  secret
root@kali32:~/Pictures# wc secret
 1  4 22 secret
root@kali32:~/Pictures# steghide embed -cf queen-annes-lace-76.jpg -ef secret
Enter passphrase:
Re-Enter passphrase:
embedding "secret" in "queen-annes-lace-76.jpg"... done
root@kali32:~/Pictures#
root@kali32:~/Pictures#
```

`steghide embed -cf queen-annes-lace-76.jpg -ef secret`

Compare images visually



Copy of original

Modified image with secret file

queen-annes-lace.jpg

Properties

Size 3264 × 2448 pixels
Type JPEG image
File Size 3.1 MB
Folder Pictures

Aperture f/2.6
Exposure 1/152 sec.
Focal Length 3.7 (lens)

queen-annes-lace-76.jpg

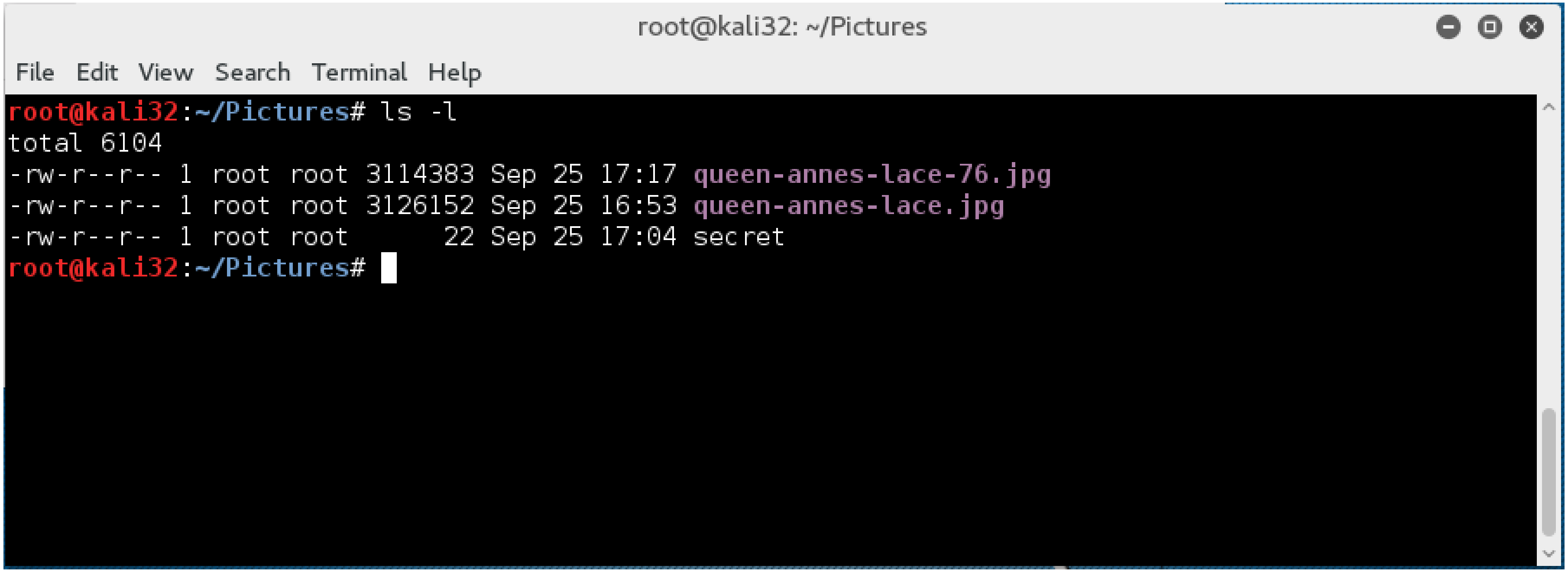
Properties

Size 3264 × 2448 pixels
Type JPEG image
File Size 3.1 MB
Folder Pictures

Aperture
Exposure
Focal Length
ISO
Metering
Camera

Date
Time

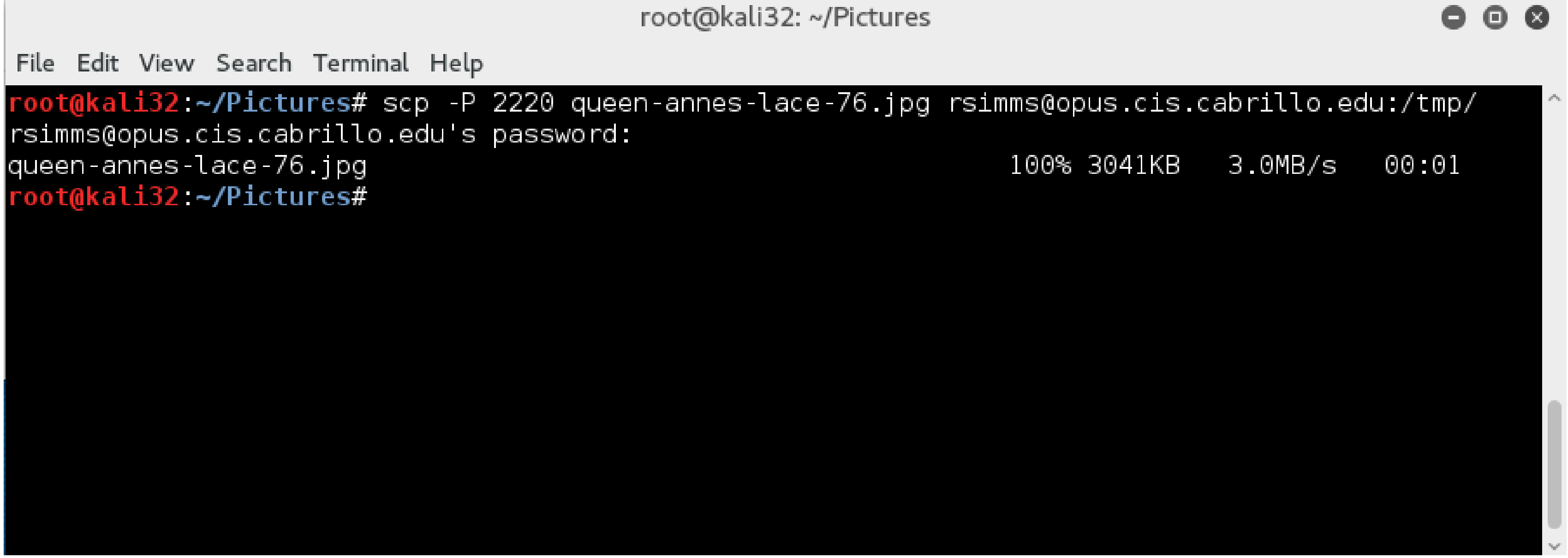
Compare images files



```
root@kali32:~/Pictures# ls -l
total 6104
-rw-r--r-- 1 root root 3114383 Sep 25 17:17 queen-annes-lace-76.jpg
-rw-r--r-- 1 root root 3126152 Sep 25 16:53 queen-annes-lace.jpg
-rw-r--r-- 1 root root      22 Sep 25 17:04 secret
root@kali32:~/Pictures# 
```

The modified file is slightly smaller

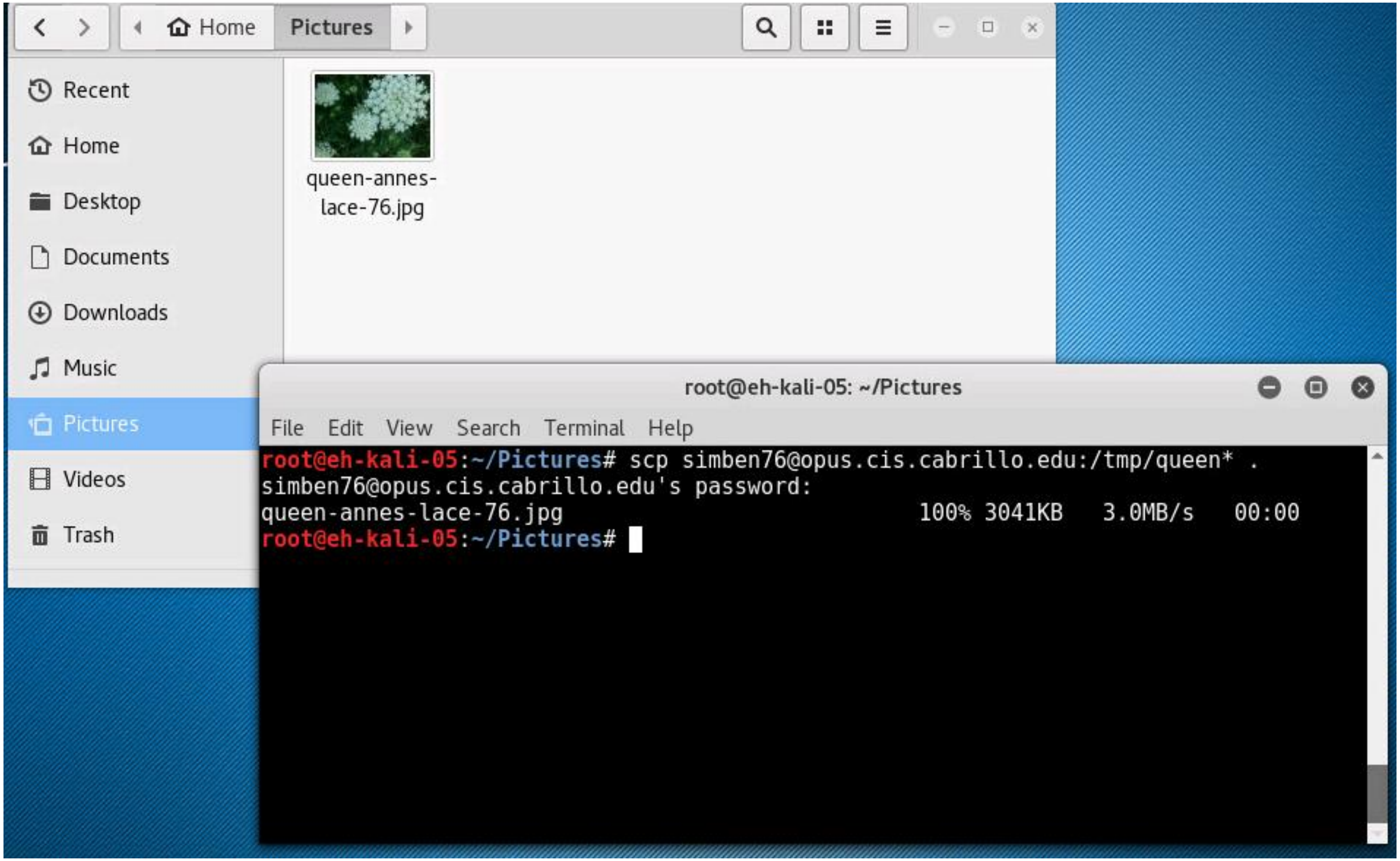
Copy modified image file



```
root@kali32:~/Pictures# scp -P 2220 queen-annes-lace-76.jpg rsimms@opus.cis.cabrillo.edu:/tmp/
rsimms@opus.cis.cabrillo.edu's password:
queen-annes-lace-76.jpg                                          100% 3041KB   3.0MB/s   00:01
root@kali32:~/Pictures#
```

Copy the file to the /tmp directory on Opus

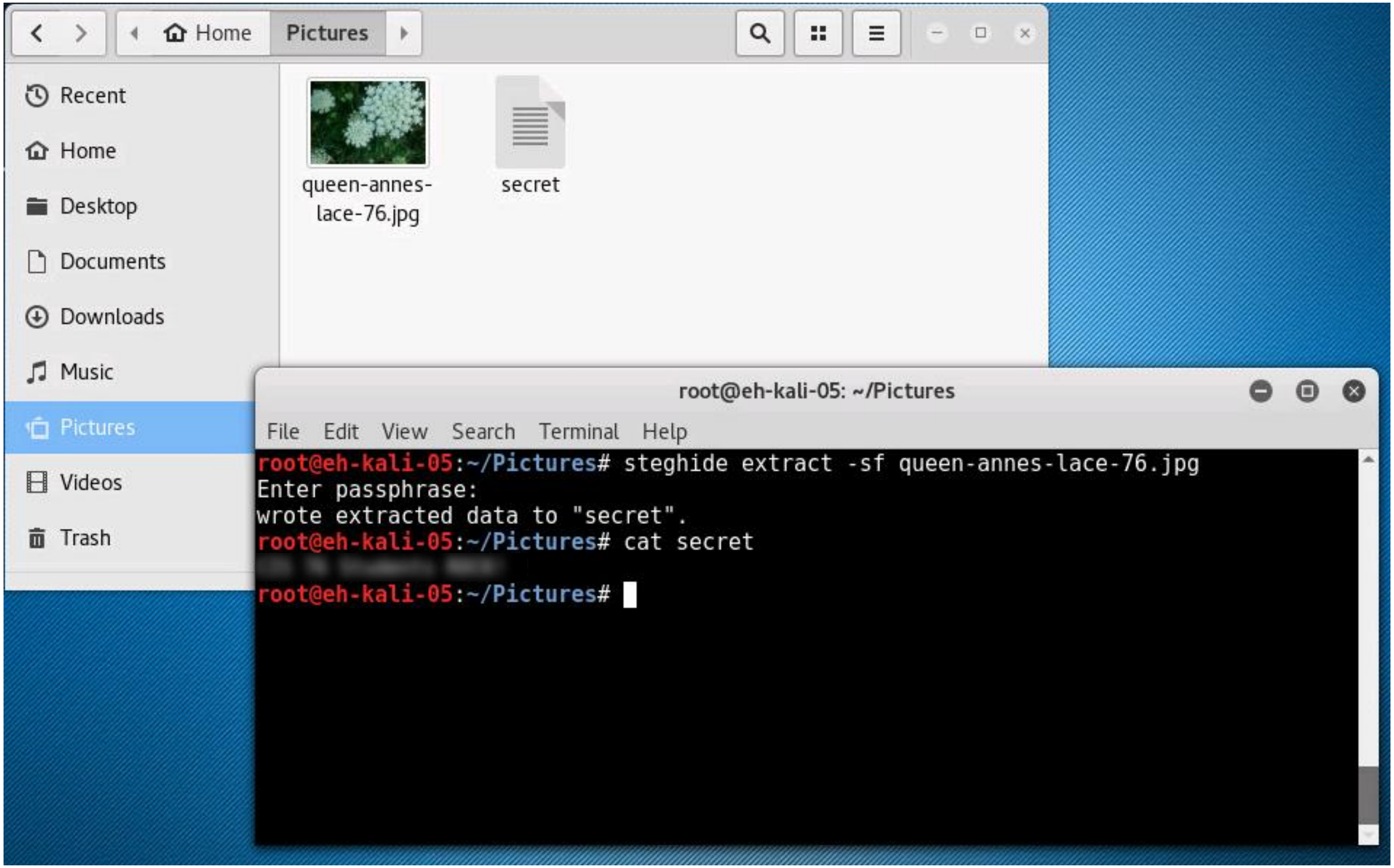
Get modified image (to EH pod)



```
root@eh-kali-05:~/Pictures# scp simben76@opus.cis.cabrillo.edu:/tmp/queen* .
simben76@opus.cis.cabrillo.edu's password:
queen-annes-lace-76.jpg                      100% 3041KB   3.0MB/s   00:00
root@eh-kali-05:~/Pictures#
```

`scp simben76@opus.cis.cabrillo.edu:/tmp/queen* .`

Extract the secret message (on EH pod)



```
root@eh-kali-05:~/Pictures# steghide extract -sf queen-annes-lace-76.jpg
Enter passphrase:
wrote extracted data to "secret".
root@eh-kali-05:~/Pictures# cat secret
[redacted]
root@eh-kali-05:~/Pictures#
```

`steghide extract -sf queen-annes-lace-76.jpg`

Activity

Install steghide on your Kali VM

```
apt-get update
apt-get install steghide
```

Download the image file from Opus

```
scp xxxxxx76@opus.cis.cabrillo.edu:/tmp/queen* .
```

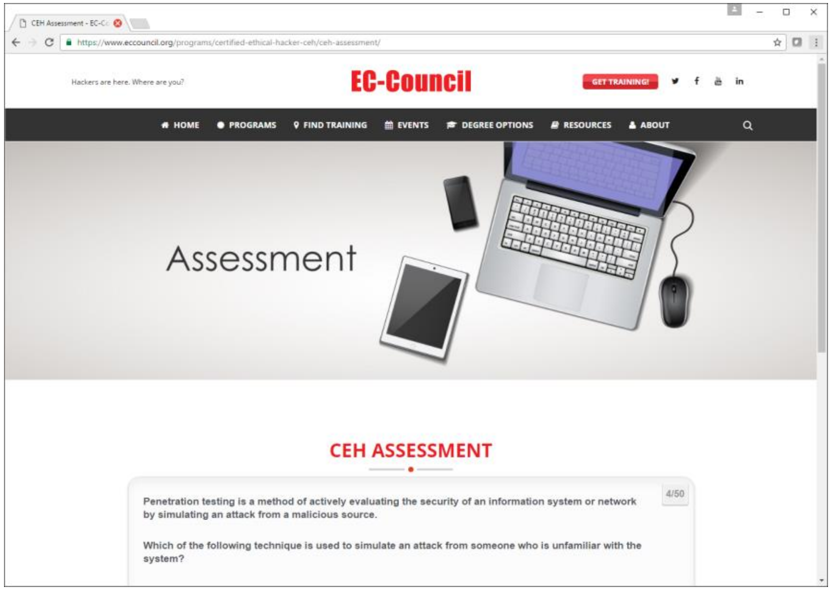
Extract the secret file

```
steghide extract -sf queen-annes-lace-76.jpg
```

Paste the secret message into the chat window

EC-Council Mini-Assessment Q31-40

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/

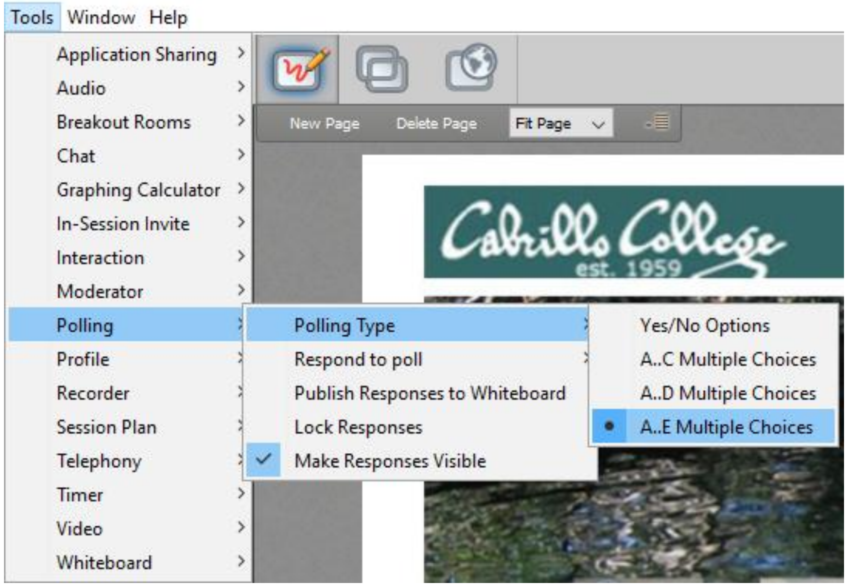


CEH ASSESSMENT

4/50

Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

Which of the following technique is used to simulate an attack from someone who is unfamiliar with the system?



Questions 31-40 (five minutes)

Domain 2

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Domain 2

Footprinting and Reconnaissance

NISGTC

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Objectives

- Explain the term Footprinting
- Explain the information that hackers seek
- Describe information gathering tools and methodology
- Explain DNS enumeration
- Explain Whois

Footprinting

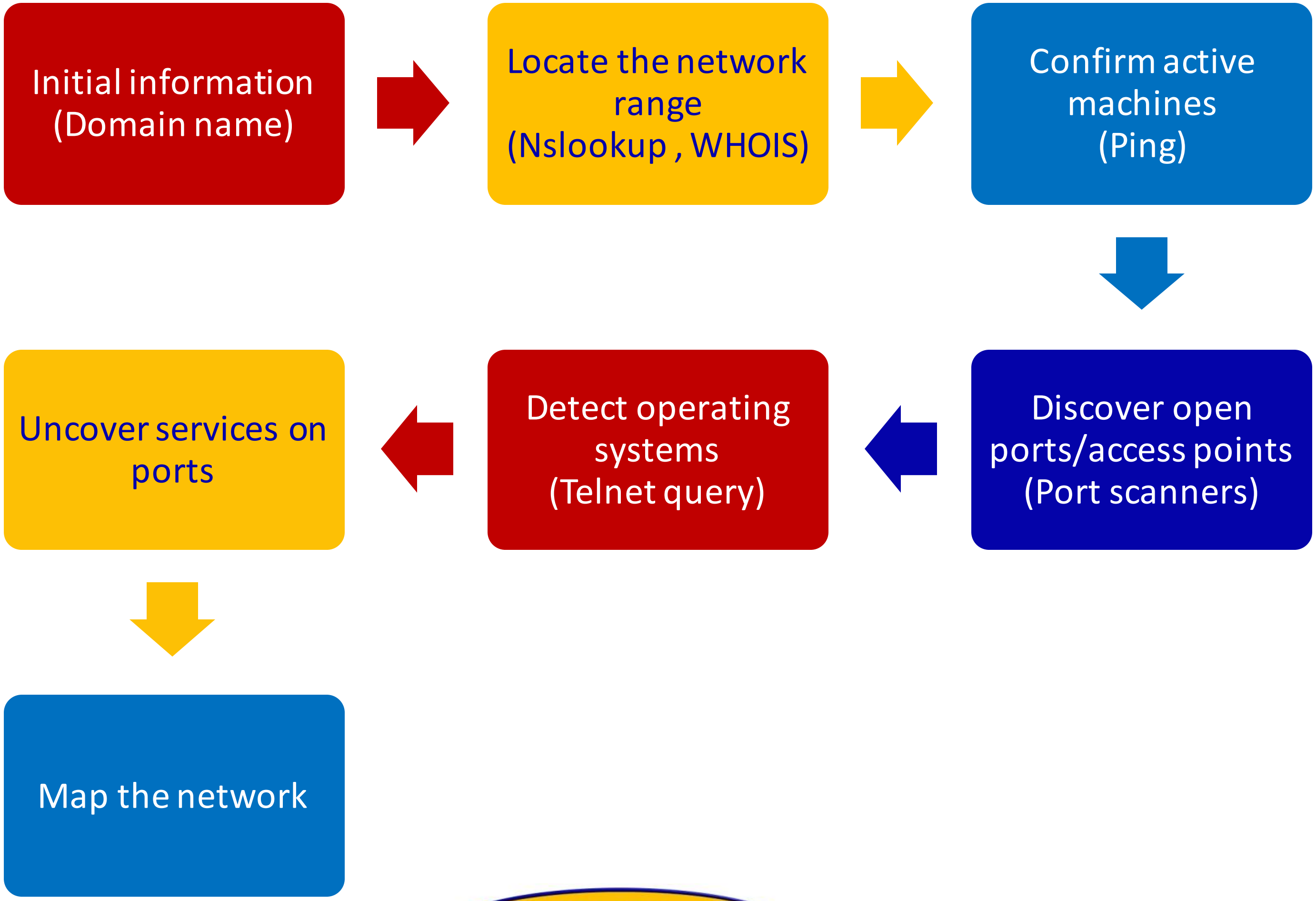
Gathering information about the security profile of a computer system or organization

First of the three pre-attack phases

Information sought:

- Domain name
- Telephone numbers
- Authentication
- Access Control Lists
- IP Address
- Services
- Presence of IDS

Information Gathering Methodology



Initial information (Domain name)

Locate the network range (Nslookup , WHOIS)

Confirm active machines (Ping)

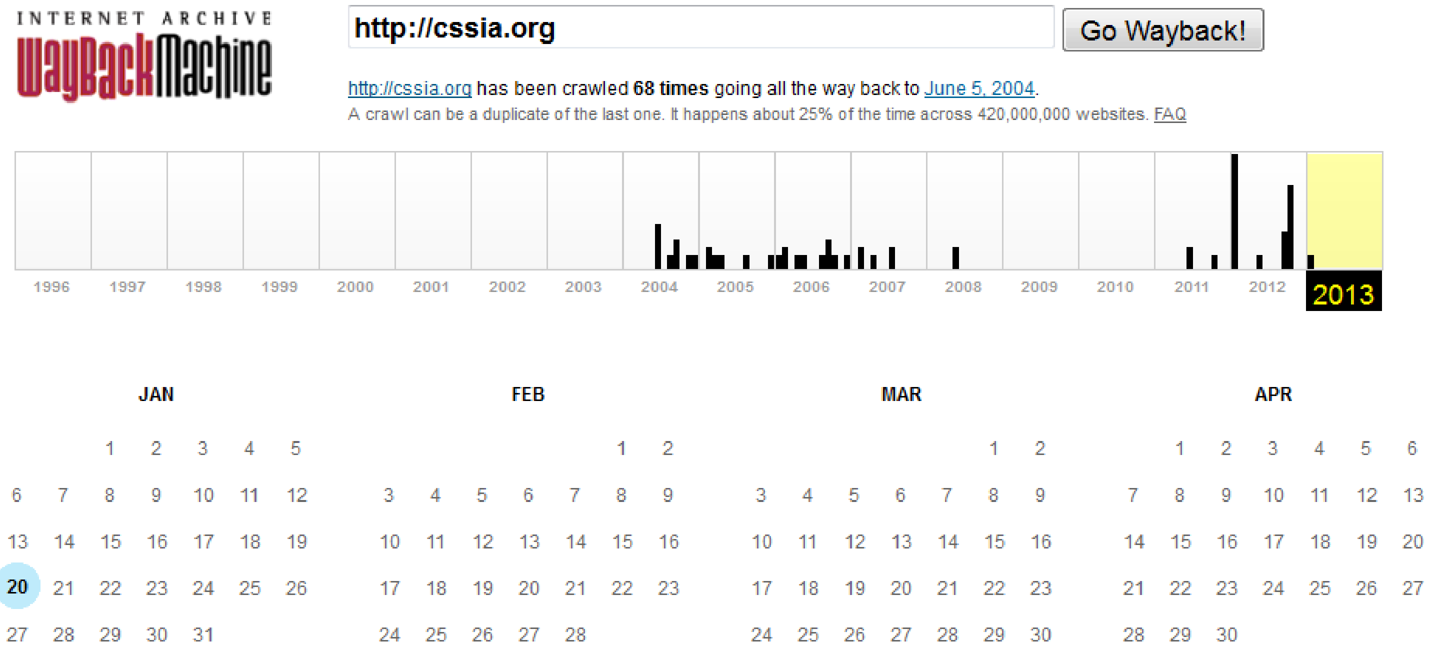
Discover open ports/access points (Port scanners)

Detect operating systems (Telnet query)

Uncover services on ports

Map the network

Archived Websites



http://cssia.org has been crawled **68 times** going all the way back to June 5, 2004.
A crawl can be a duplicate of the last one. It happens about 25% of the time across 420,000,000 websites. FAQ

JAN

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEB

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

MAR

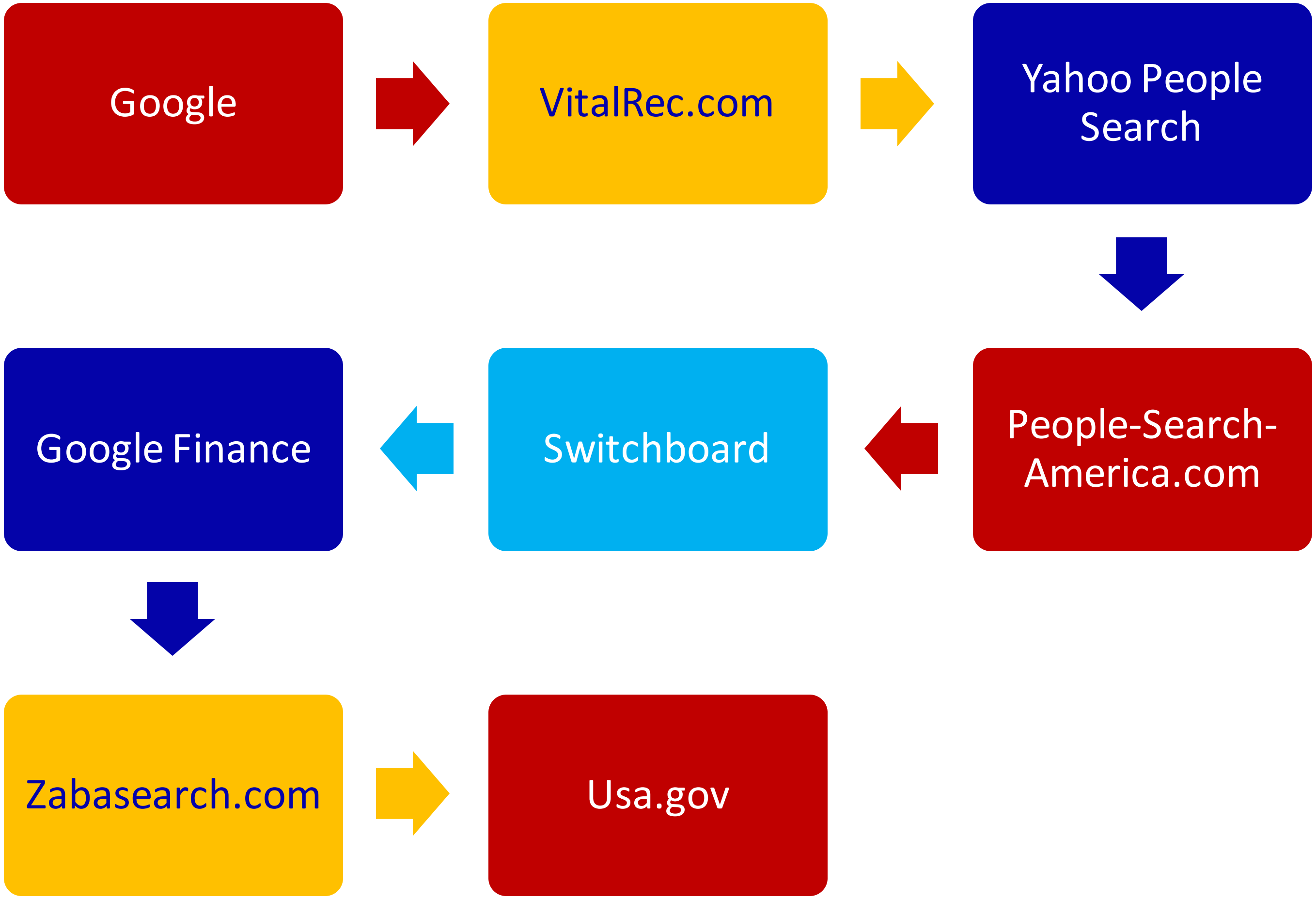
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

APR

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

This is a partial screenshot from www.archive.org showing the archived information available for cssia.org

Searching Public Records


Google

VitalRec.com

Yahoo People Search

People-Search-America.com

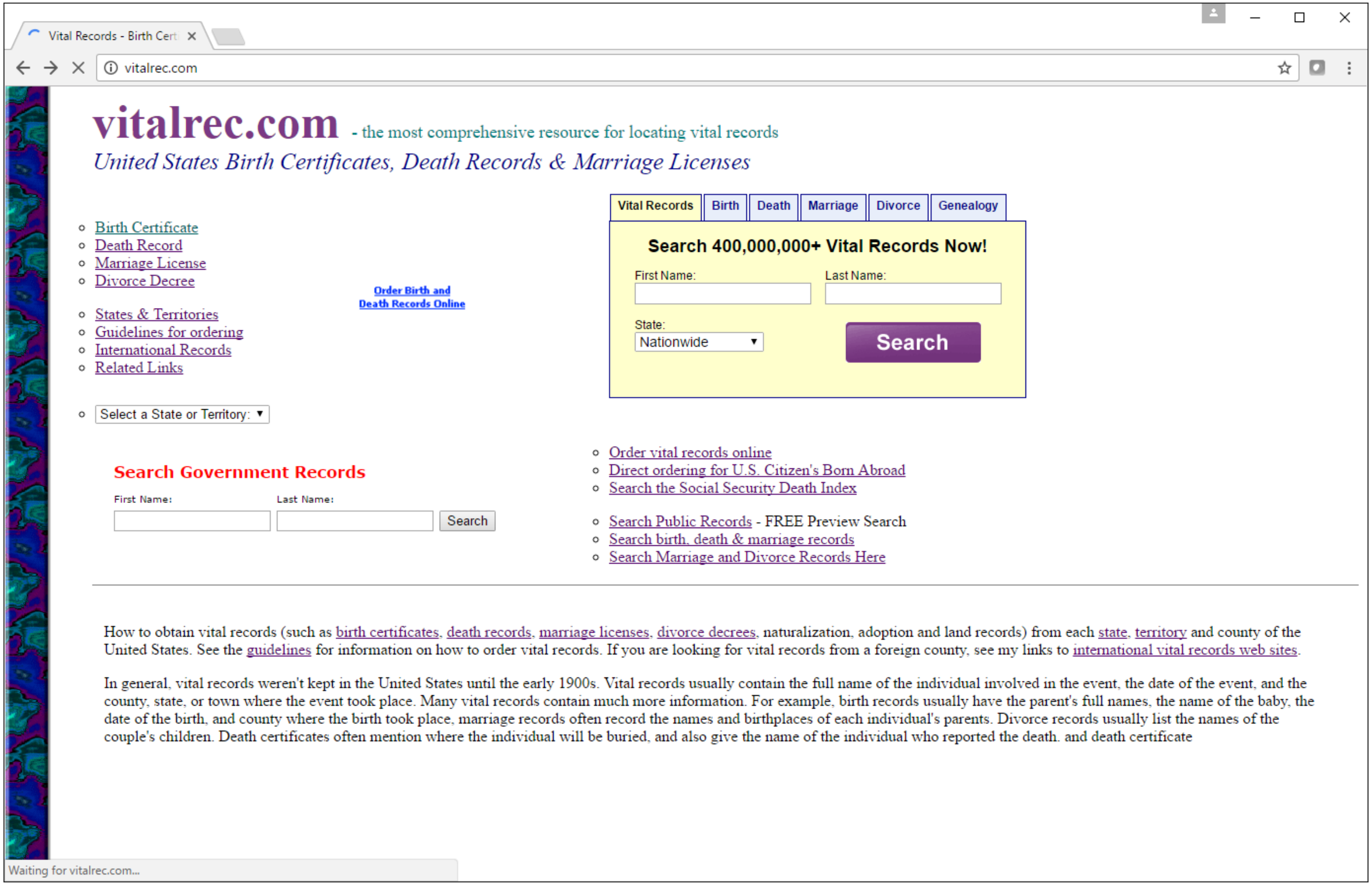
Switchboard

Google Finance

Zabasearch.com

Usa.gov

vitalrec.com



vitalrec.com - the most comprehensive resource for locating vital records

United States Birth Certificates, Death Records & Marriage Licenses

- Birth Certificate
- Death Record
- Marriage License
- Divorce Decree

- States & Territories
- Guidelines for ordering
- International Records
- Related Links

- Select a State or Territory: ▾

Order Birth and Death Records Online

Search 400,000,000+ Vital Records Now!

First Name: Last Name:

State: Nationwide ▾

Search Government Records

First Name: Last Name:

- Order vital records online
- Direct ordering for U.S. Citizen's Born Abroad
- Search the Social Security Death Index

- Search Public Records - FREE Preview Search
- Search birth, death & marriage records
- Search Marriage and Divorce Records Here

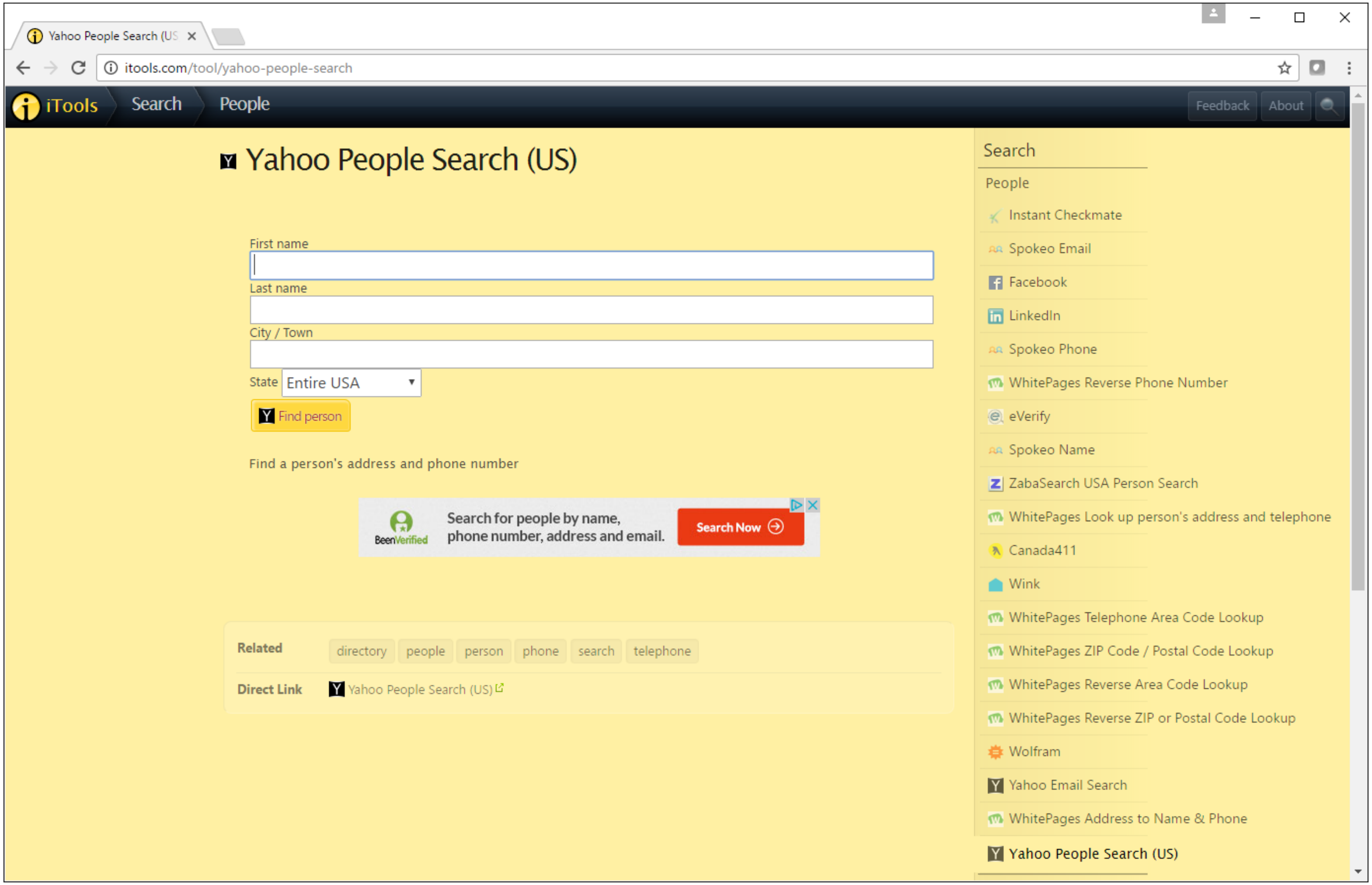
How to obtain vital records (such as birth certificates, death records, marriage licenses, divorce decrees, naturalization, adoption and land records) from each state, territory and county of the United States. See the guidelines for information on how to order vital records. If you are looking for vital records from a foreign county, see my links to international vital records web sites.

In general, vital records weren't kept in the United States until the early 1900s. Vital records usually contain the full name of the individual involved in the event, the date of the event, and the county, state, or town where the event took place. Many vital records contain much more information. For example, birth records usually have the parent's full names, the name of the baby, the date of the birth, and county where the birth took place, marriage records often record the names and birthplaces of each individual's parents. Divorce records usually list the names of the children. Death certificates often mention where the individual will be buried, and also give the name of the individual who reported the death. and death certificate

Waiting for vitalrec.com...

http://www.vitalrec.com/deathrecords/

Yahoo People Search


Yahoo People Search (US
itools.com/tool/yahoo-people-search
iTools
Search
People
Feedback
About

Yahoo People Search (US)

First name

Last name

City / Town

State: Entire USA

Find a person's address and phone number

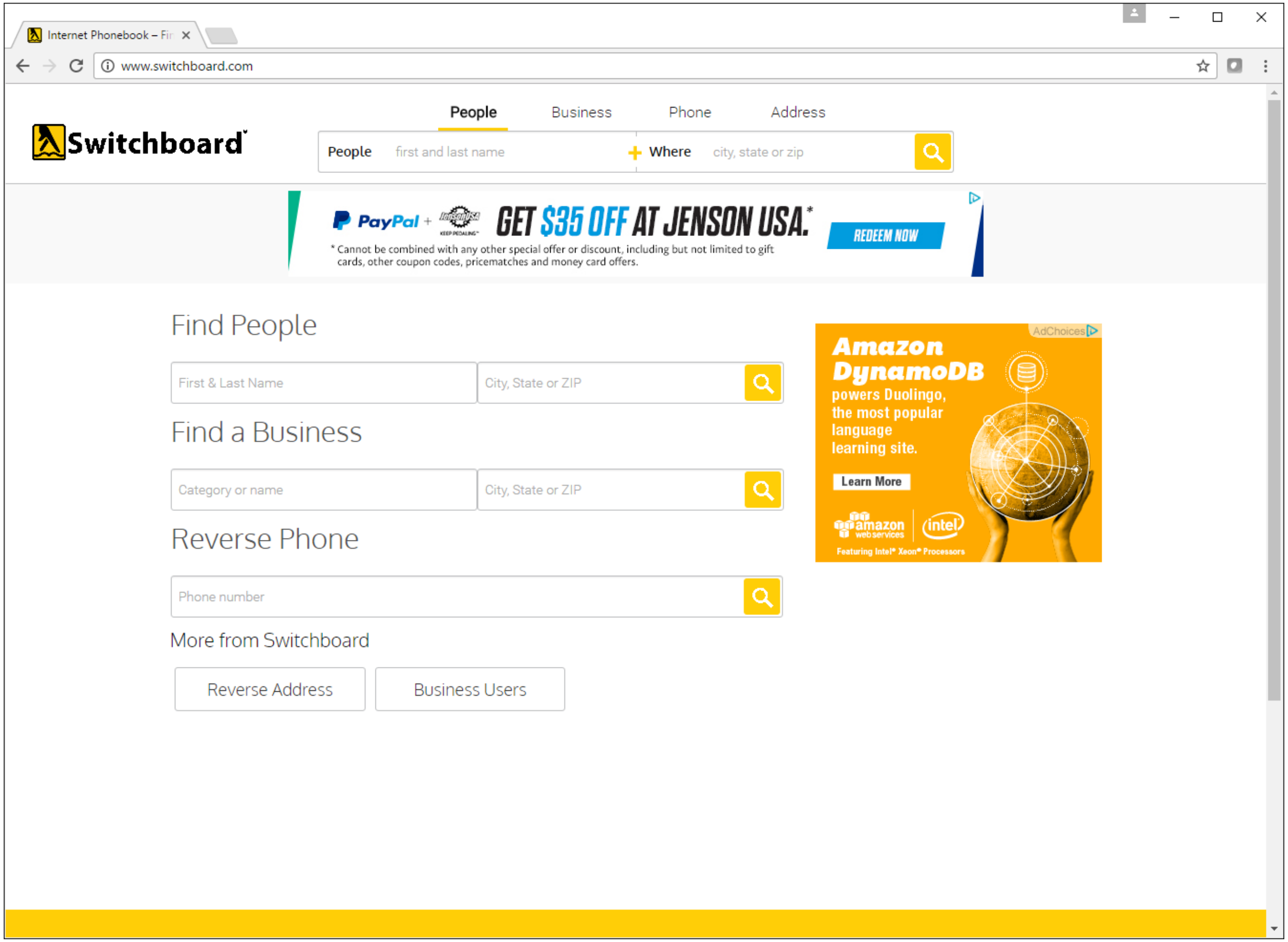
Related: directory, people, person, phone, search, telephone

Direct Link: Yahoo People Search (US)

Search
People
Instant Checkmate
Spokeo Email
Facebook
LinkedIn
Spokeo Phone
WhitePages Reverse Phone Number
eVerify
Spokeo Name
ZabaSearch USA Person Search
WhitePages Look up person's address and telephone
Canada411
Wink
WhitePages Telephone Area Code Lookup
WhitePages ZIP Code / Postal Code Lookup
WhitePages Reverse Area Code Lookup
WhitePages Reverse ZIP or Postal Code Lookup
Wolfram
Yahoo Email Search
WhitePages Address to Name & Phone
Yahoo People Search (US)

http://itools.com/tool/yahoo-people-search

Switchboard



Internet Phonebook – Fir

www.switchboard.com

Switchboard

People Business Phone Address

People first and last name + Where city, state or zip

Find People

First & Last Name | City, State or ZIP

Find a Business

Category or name | City, State or ZIP

Reverse Phone

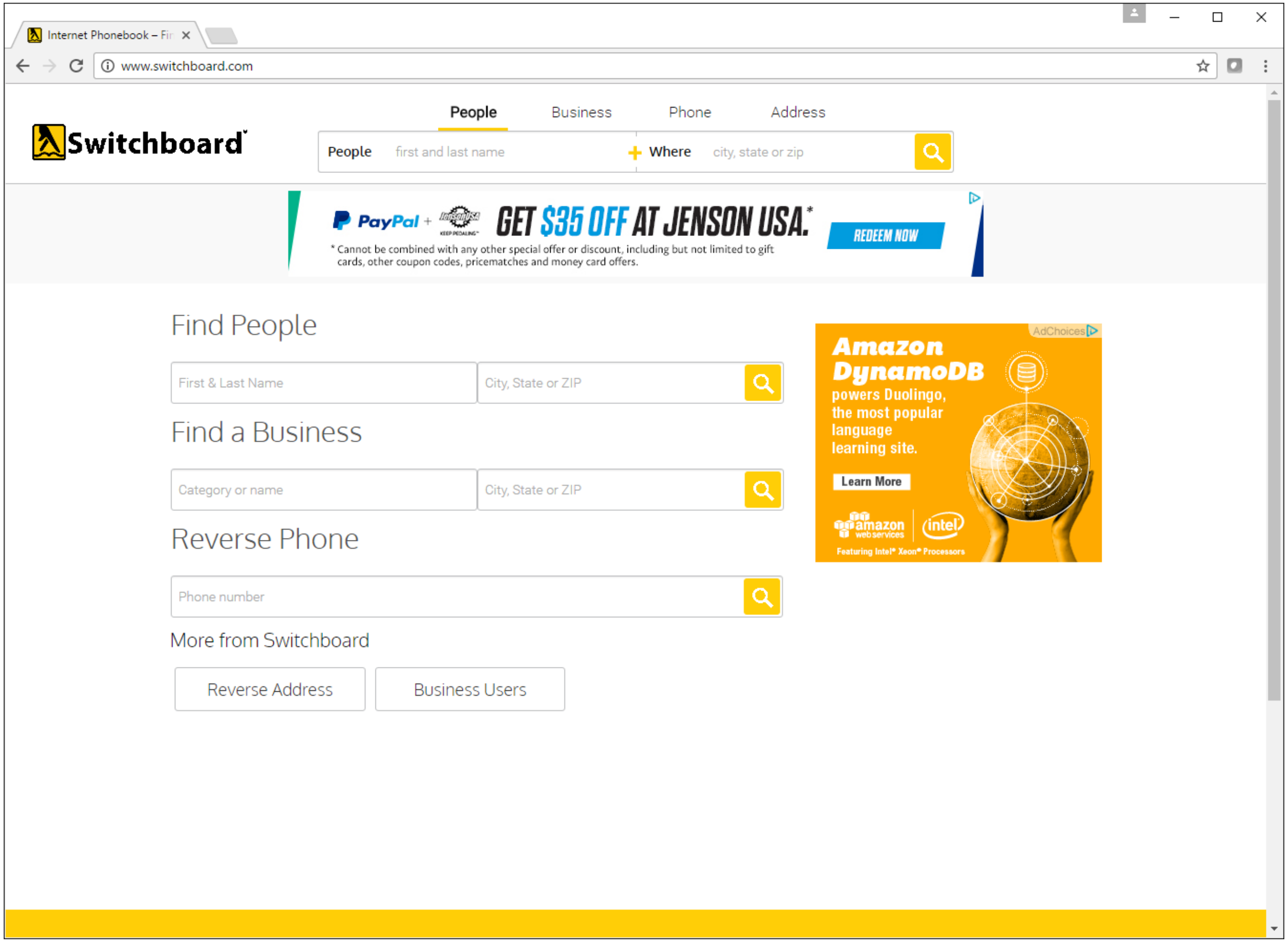
Phone number

More from Switchboard

Reverse Address | Business Users

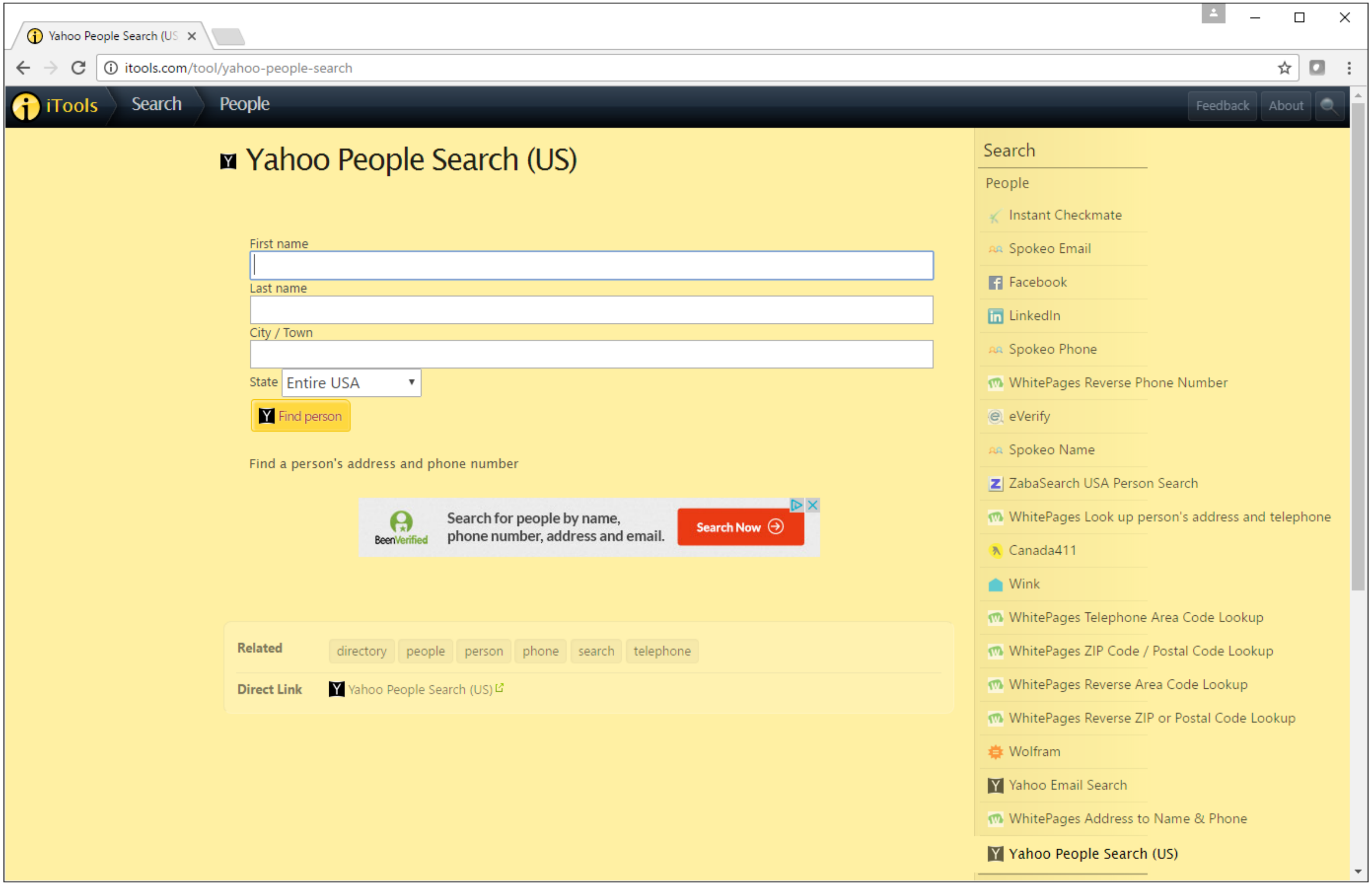
http://www.switchboard.com/

Switchboard



http://www.switchboard.com/

Yahoo People Search



Yahoo People Search (US)

First name

Last name

City / Town

State Entire USA

Find person

Find a person's address and phone number

Related	directory people person phone search telephone
Direct Link	Yahoo People Search (US)

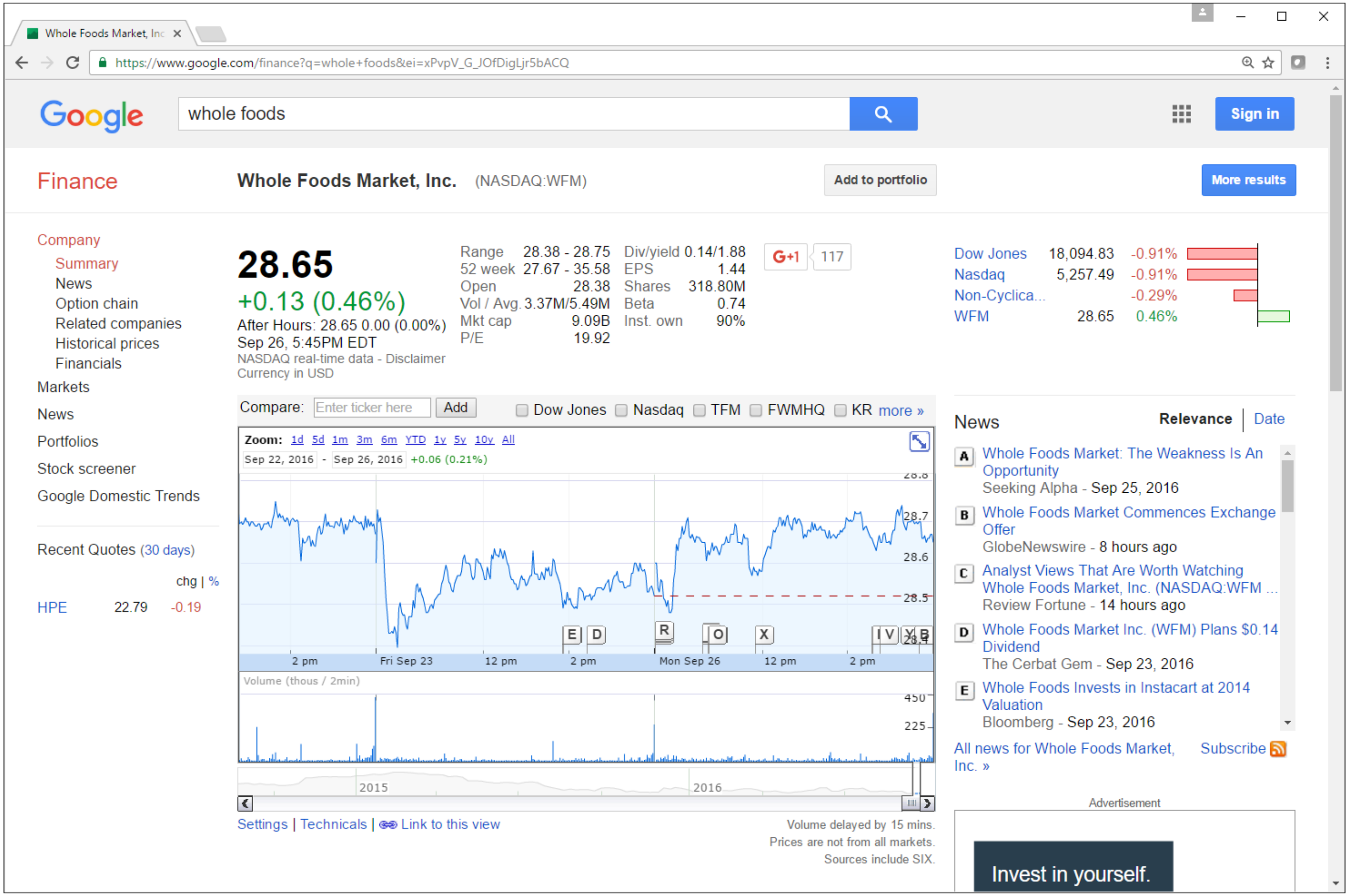
Search

People

- Instant Checkmate
- Spokeo Email
- Facebook
- LinkedIn
- Spokeo Phone
- WhitePages Reverse Phone Number
- eVerify
- Spokeo Name
- ZabaSearch USA Person Search
- WhitePages Look up person's address and telephone
- Canada411
- Wink
- WhitePages Telephone Area Code Lookup
- WhitePages ZIP Code / Postal Code Lookup
- WhitePages Reverse Area Code Lookup
- WhitePages Reverse ZIP or Postal Code Lookup
- Wolfram
- Yahoo Email Search
- WhitePages Address to Name & Phone
- Yahoo People Search (US)

http://itools.com/tool/yahoo-people-search

Google Finance



Whole Foods Market, Inc ×

https://www.google.com/finance?q=whole+foods&ei=xPvpV_G_JOfDigLjr5bACQ

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Finance

Whole Foods Market, Inc. (NASDAQ:WFM) | Add to portfolio | More results

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Recent Quotes (30 days)

		chg | %
HPE	22.79	-0.19

28.65

+0.13 (0.46%)

After Hours: 28.65 0.00 (0.00%)

Sep 26, 5:45PM EDT

NASDAQ real-time data - Disclaimer

Currency in USD

Range	28.38 - 28.75	Div/yield	0.14/1.88
52 week	27.67 - 35.58	EPS	1.44
Open	28.38	Shares	318.80M
Vol / Avg.	3.37M/5.49M	Beta	0.74
Mkt cap	9.09B	Inst. own	90%
P/E	19.92		

G+1 117

Dow Jones	18,094.83	-0.91%
Nasdaq	5,257.49	-0.91%
Non-Cyclica...		-0.29%
WFM	28.65	0.46%

Compare: Enter ticker here | Add | □ Dow Jones □ Nasdaq □ TFM □ FWMHQ □ KR more »

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Volume delayed by 15 mins.
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Sources include SIX.

News | **Relevance** | Date

A. Whole Foods Market: The Weakness Is An Opportunity
Seeking Alpha - Sep 25, 2016

B. Whole Foods Market Commences Exchange Offer
GlobeNewswire - 8 hours ago

C. Analyst Views That Are Worth Watching Whole Foods Market, Inc. (NASDAQ:WFM ...
Review Fortune - 14 hours ago

D. Whole Foods Market Inc. (WFM) Plans $0.14 Dividend
The Cerbat Gem - Sep 23, 2016

E. Whole Foods Invests in Instacart at 2014 Valuation
Bloomberg - Sep 23, 2016

All news for Whole Foods Market, Inc. » | Subscribe

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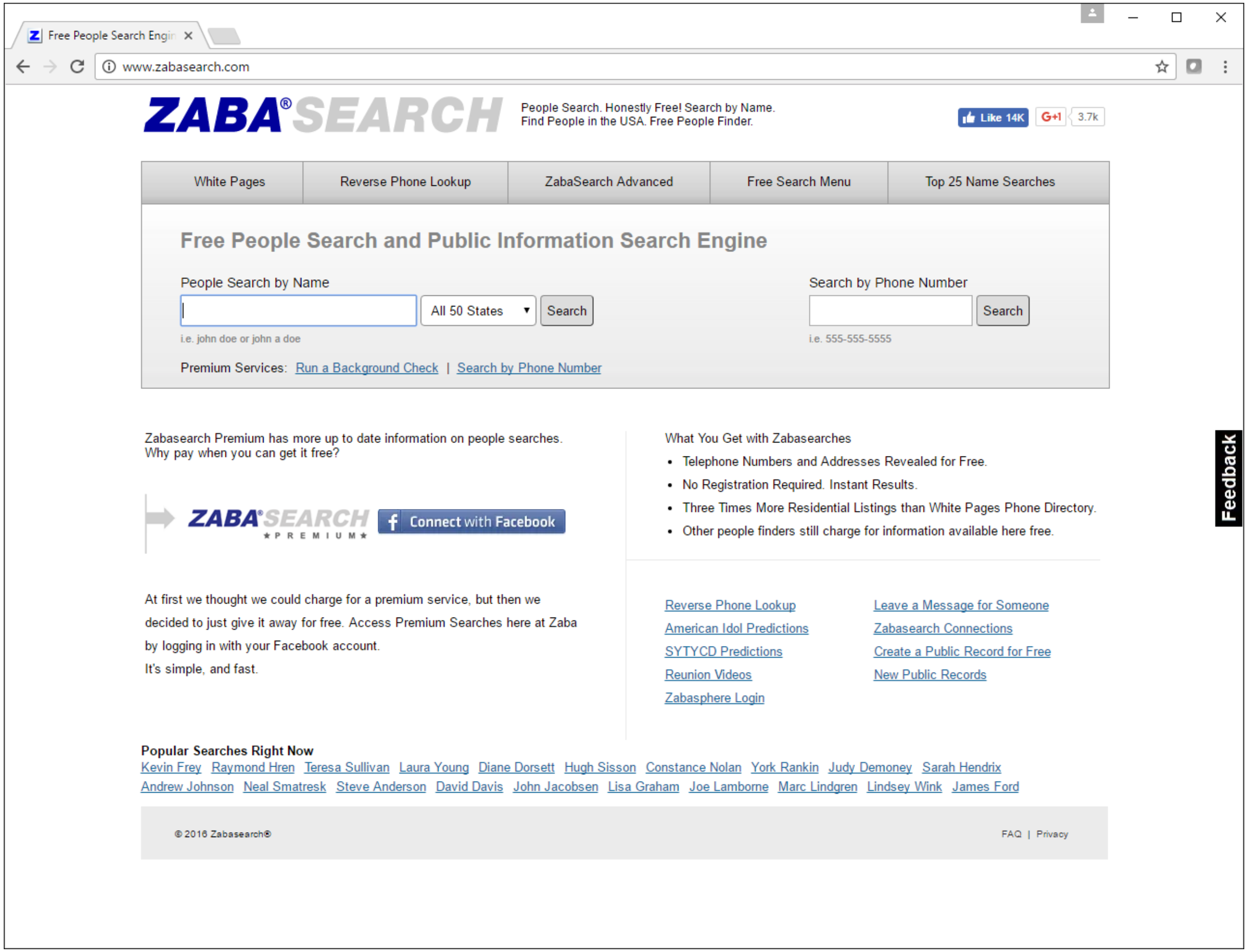

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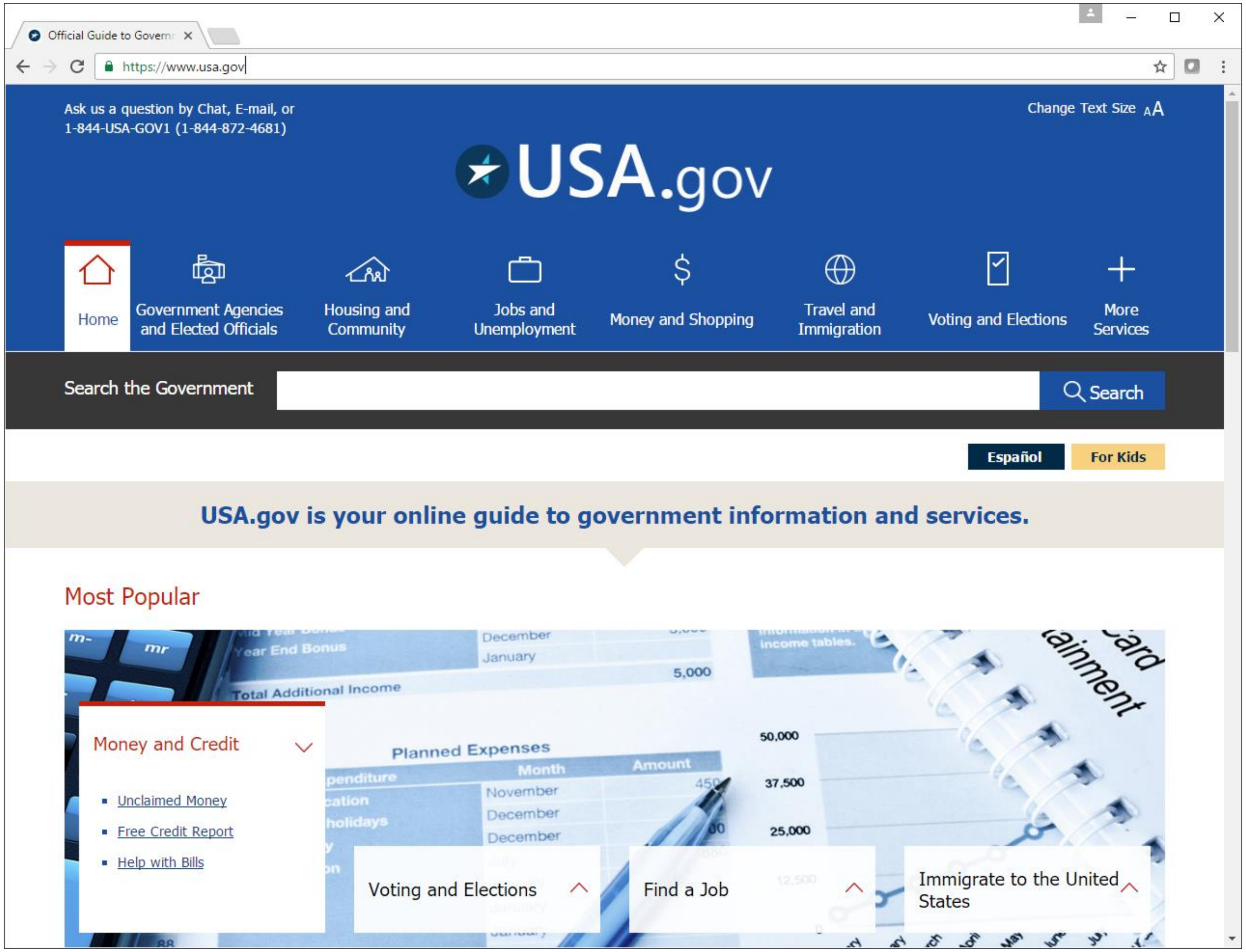

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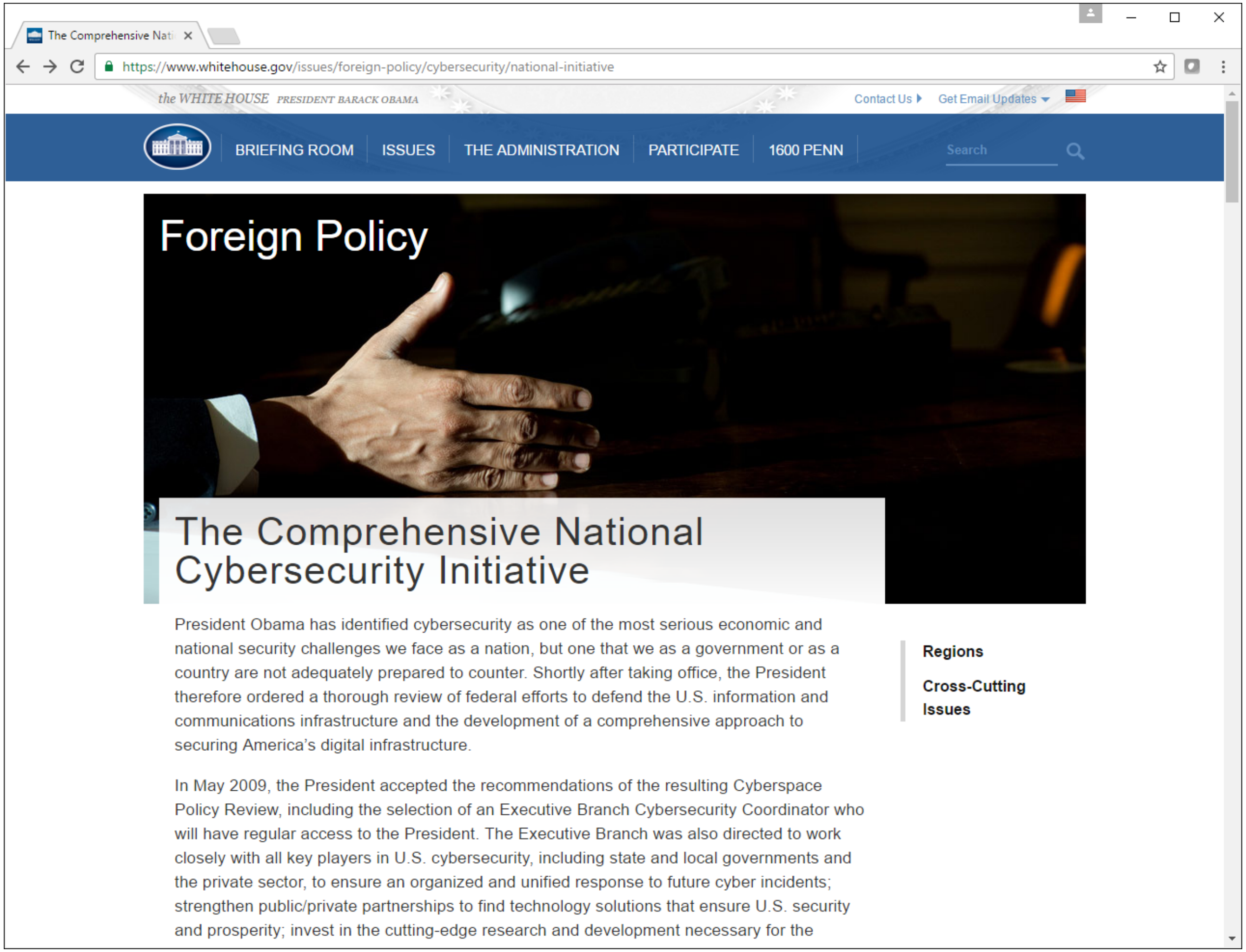


The Comprehensive National Cybersecurity Initiative

President Obama has identified cybersecurity as one of the most serious economic and national security challenges we face as a nation, but one that we as a government or as a country are not adequately prepared to counter. Shortly after taking office, the President therefore ordered a thorough review of federal efforts to defend the U.S. information and communications infrastructure and the development of a comprehensive approach to securing America's digital infrastructure.

In May 2009, the President accepted the recommendations of the resulting Cyberspace Policy Review, including the selection of an Executive Branch Cybersecurity Coordinator who will have regular access to the President. The Executive Branch was also directed to work closely with all key players in U.S. cybersecurity, including state and local governments and the private sector, to ensure an organized and unified response to future cyber incidents; strengthen public/private partnerships to find technology solutions that ensure U.S. security and prosperity; invest in the cutting-edge research and development necessary for the

https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative

Tools

Domain Name Search

- WHOIS
- SmartWHOIS.com
- Active Whois Network Tool

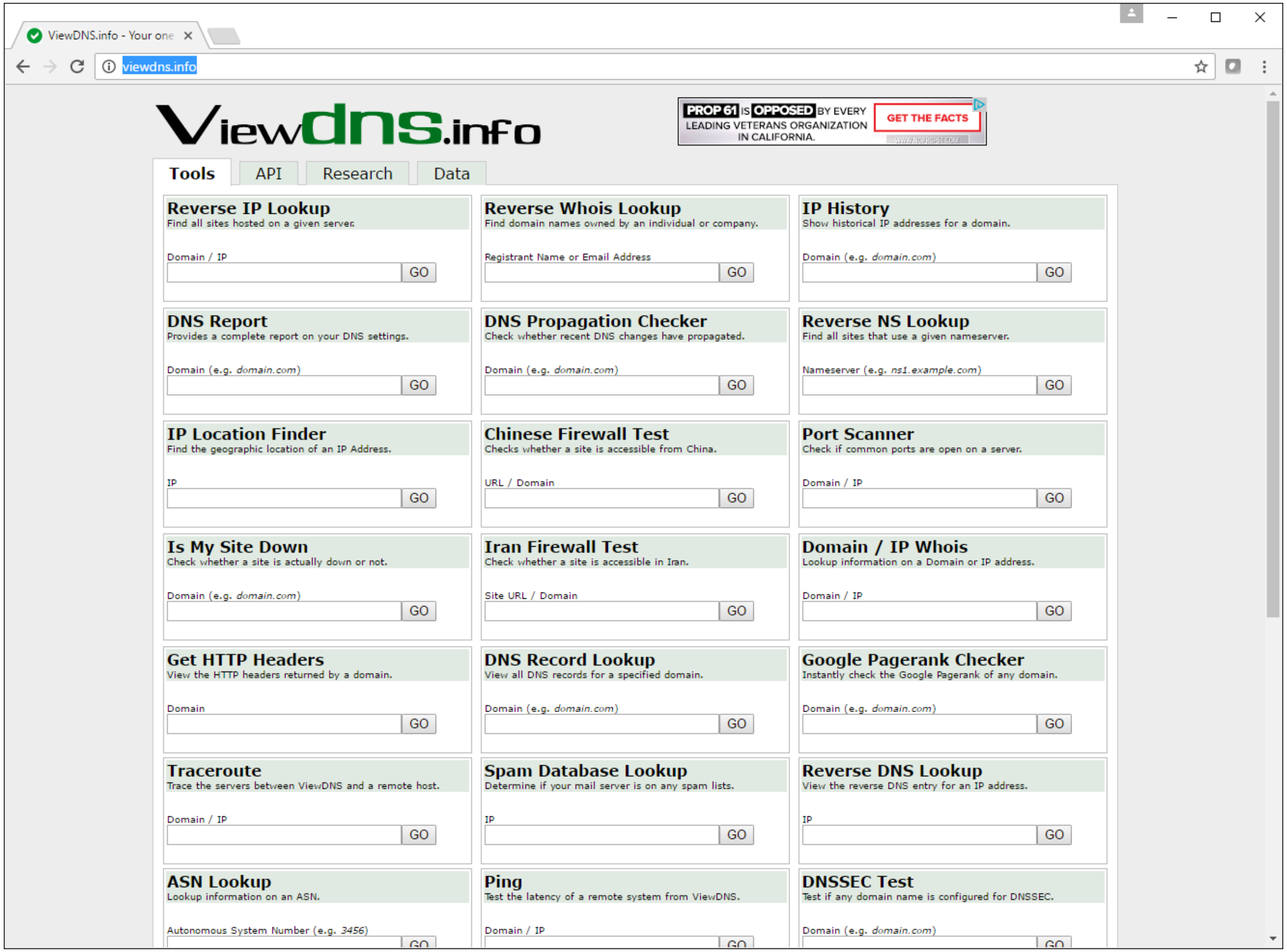
DNS Information Tools

- ViewDNS.info
- DNS Enumerator
- SpiderFoot
- Nslookup

Zone Transfers

- DNStuff.com
- Expired Domains

viewdns.info



Reverse IP Lookup
Find all sites hosted on a given server.
Domain / IP

Reverse Whois Lookup
Find domain names owned by an individual or company.
Registrant Name or Email Address

IP History
Show historical IP addresses for a domain.
Domain (e.g. *domain.com*)

DNS Report
Provides a complete report on your DNS settings.
Domain (e.g. *domain.com*)

DNS Propagation Checker
Check whether recent DNS changes have propagated.
Domain (e.g. *domain.com*)

Reverse NS Lookup
Find all sites that use a given nameserver.
Nameserver (e.g. *ns1.example.com*)

IP Location Finder
Find the geographic location of an IP Address.
IP

Chinese Firewall Test
Checks whether a site is accessible from China.
URL / Domain

Port Scanner
Check if common ports are open on a server.
Domain / IP

Is My Site Down
Check whether a site is actually down or not.
Domain (e.g. *domain.com*)

Iran Firewall Test
Check whether a site is accessible in Iran.
Site URL / Domain

Domain / IP Whois
Lookup information on a Domain or IP address.
Domain / IP

Get HTTP Headers
View the HTTP headers returned by a domain.
Domain

DNS Record Lookup
View all DNS records for a specified domain.
Domain (e.g. *domain.com*)

Google Pagerank Checker
Instantly check the Google Pagerank of any domain.
Domain (e.g. *domain.com*)

Traceroute
Trace the servers between ViewDNS and a remote host.
Domain / IP

Spam Database Lookup
Determine if your mail server is on any spam lists.
IP

Reverse DNS Lookup
View the reverse DNS entry for an IP address.
IP

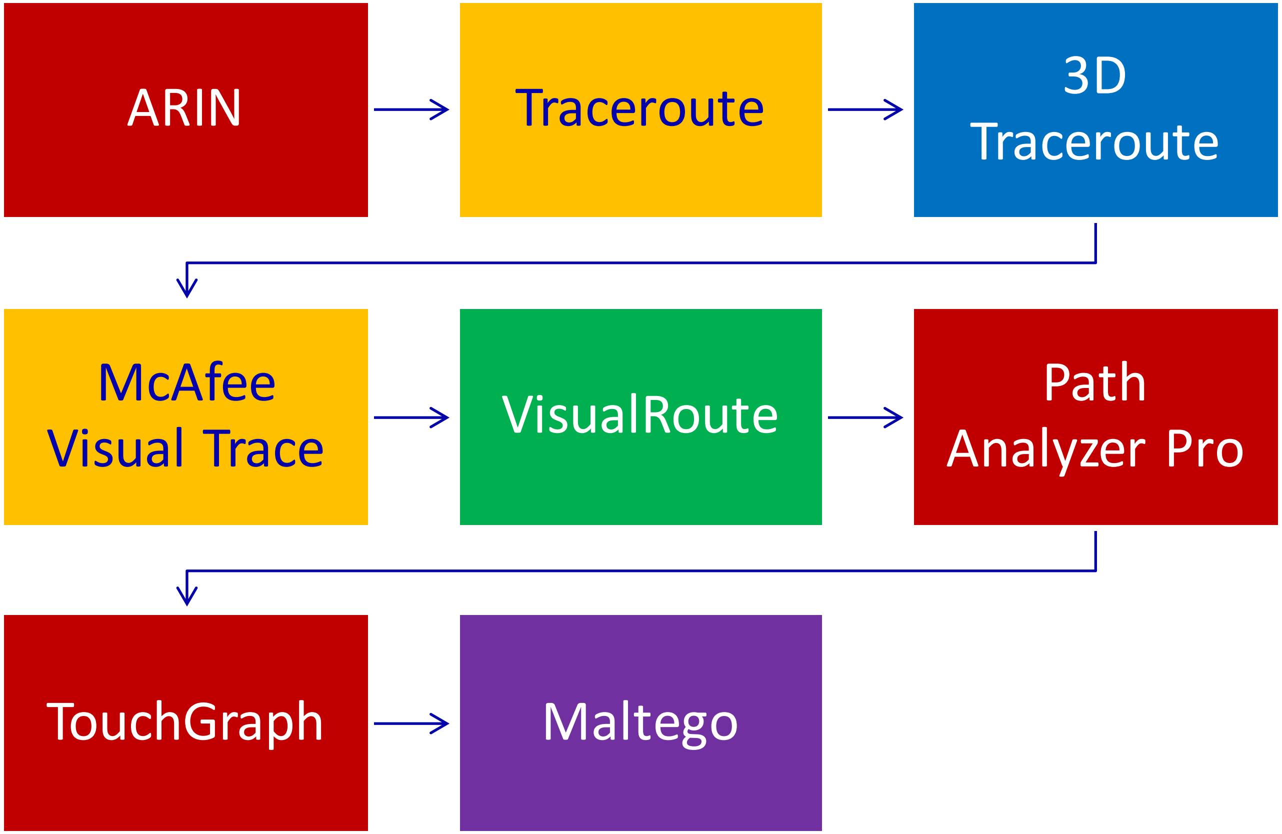
ASN Lookup
Lookup information on an ASN.
Autonomous System Number (e.g. *3456*)

Ping
Test the latency of a remote system from ViewDNS.
Domain / IP

DNSSEC Test
Test if any domain name is configured for DNSSEC.
Domain (e.g. *domain.com*)

http://viewdns.info/

Locating the Network Range


ARIN → Traceroute → 3D Traceroute → McAfee Visual Trace → VisualRoute → Path Analyzer Pro → TouchGraph → Maltego

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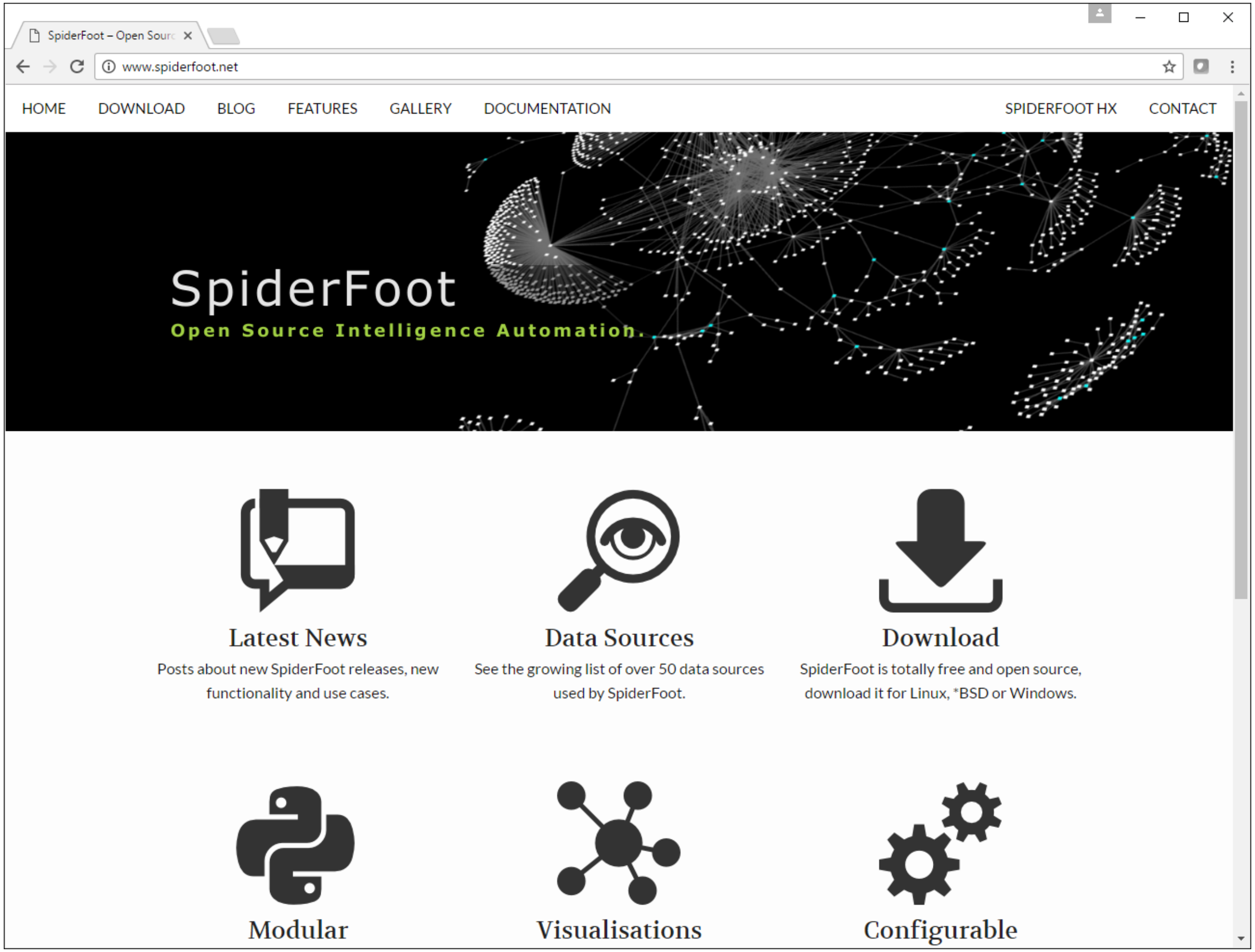
spiderfoot



SpiderFoot

Open Source Intelligence Automation.

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Posts about new SpiderFoot releases, new functionality and use cases.

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See the growing list of over 50 data sources used by SpiderFoot.

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SpiderFoot is totally free and open source, download it for Linux, *BSD or Windows.

Modular

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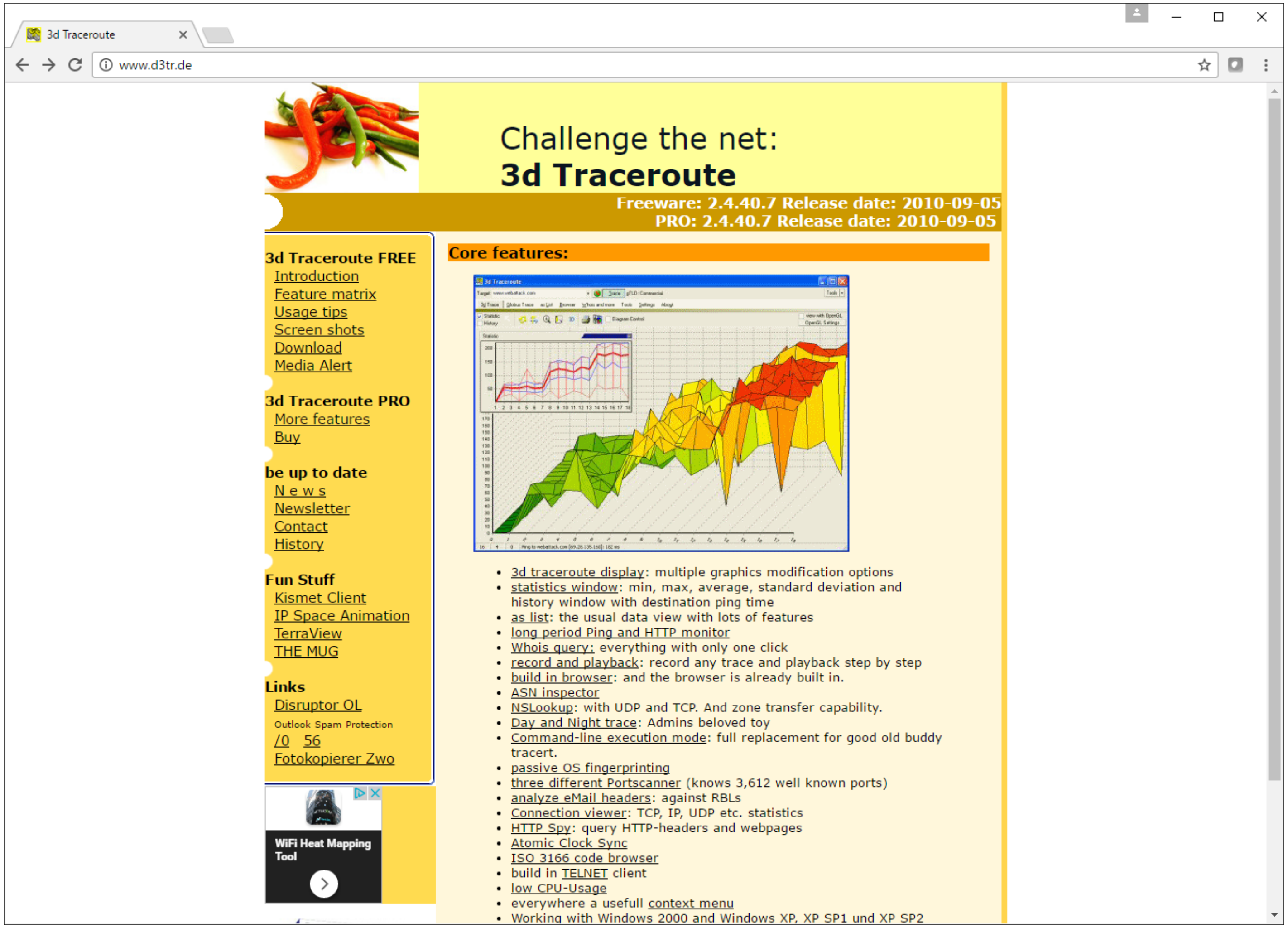
http://www.spiderfoot.net/

3d Traceroute



Challenge the net:
3d Traceroute

Freeware: 2.4.40.7 Release date: 2010-09-05
PRO: 2.4.40.7 Release date: 2010-09-05

3d Traceroute FREE
Introduction
Feature matrix
Usage tips
Screen shots
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Outlook Spam Protection
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Core features:

- 3d traceroute display: multiple graphics modification options
- statistics window: min, max, average, standard deviation and history window with destination ping time
- as list: the usual data view with lots of features
- long period Ping and HTTP monitor
- Whois query: everything with only one click
- record and playback: record any trace and playback step by step
- build in browser: and the browser is already built in.
- ASN inspector
- NSLookup: with UDP and TCP. And zone transfer capability.
- Day and Night trace: Admins beloved toy
- Command-line execution mode: full replacement for good old buddy tracert.
- passive OS fingerprinting
- three different Portscanner (knows 3,612 well known ports)
- analyze eMail headers: against RBLs
- Connection viewer: TCP, IP, UDP etc. statistics
- HTTP Spy: query HTTP-headers and webpages
- Atomic Clock Sync
- ISO 3166 code browser
- build in TELNET client
- low CPU-Usage
- everywhere a usefull context menu
- Working with Windows 2000 and Windows XP, XP SP1 und XP SP2

http://www.d3tr.de/

Other Useful Tools

E-Mail Spiders

Locating Network Activity

- GEO Spider

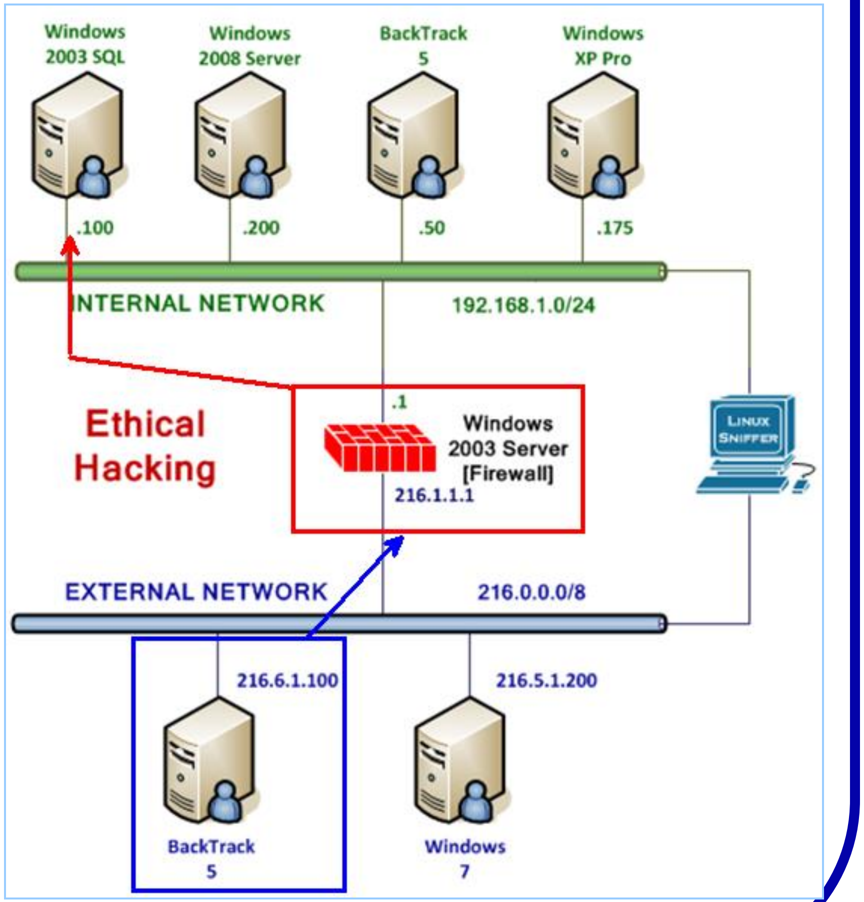
Google Earth

Meta Search Engines

- Dogpile
- WebFerret
- Robots.txt
- WTR – Web the Ripper 2
- Web Site Watcher

Conducting Active and Passive Reconnaissance Against a Target

- External Active Reconnaissance
  - ✓ Perform a banner grab
  - ✓ Use Google for research
  - ✓ Zenmap utility
- Internal Active Reconnaissance
  - ✓ Metasploit
- Internal and External Passive Reconnaissance



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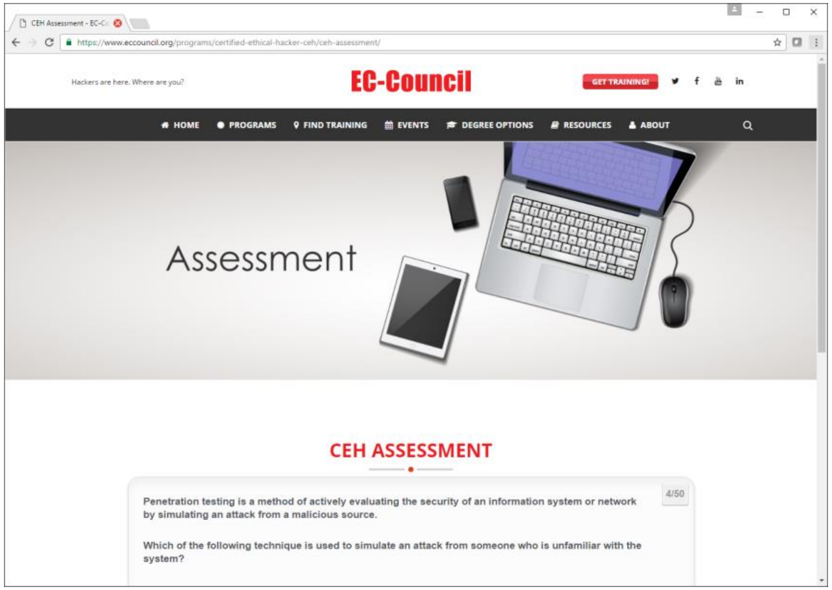
EC-Council Mini-Assessment Q41-50

https://www.eccouncil.org/programs/certified-ethical-hacker-ceh/ceh-assessment/

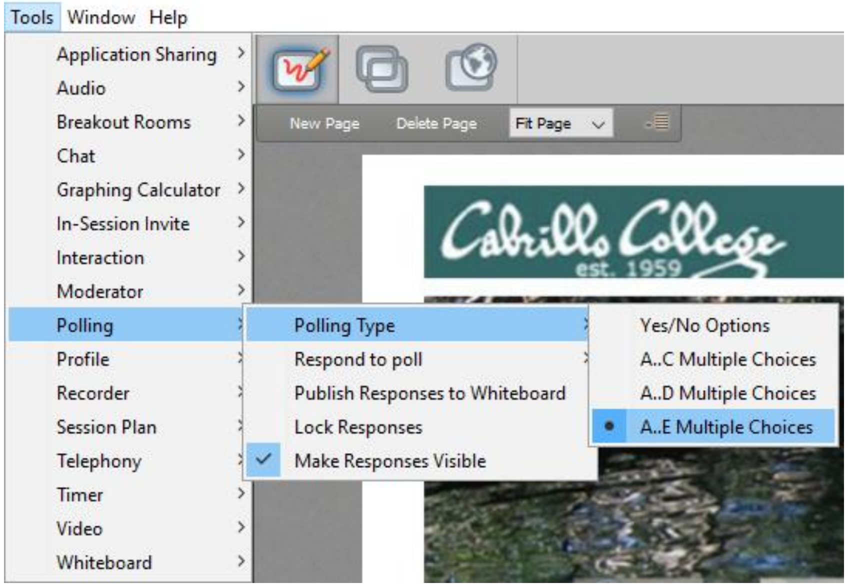


CEH ASSESSMENT

4/50

Penetration testing is a method of actively evaluating the security of an information system or network by simulating an attack from a malicious source.

Which of the following technique is used to simulate an attack from someone who is unfamiliar with the system?



Questions 41-50 (five minutes)

Domain 7

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Domain 7

Viruses and Worms

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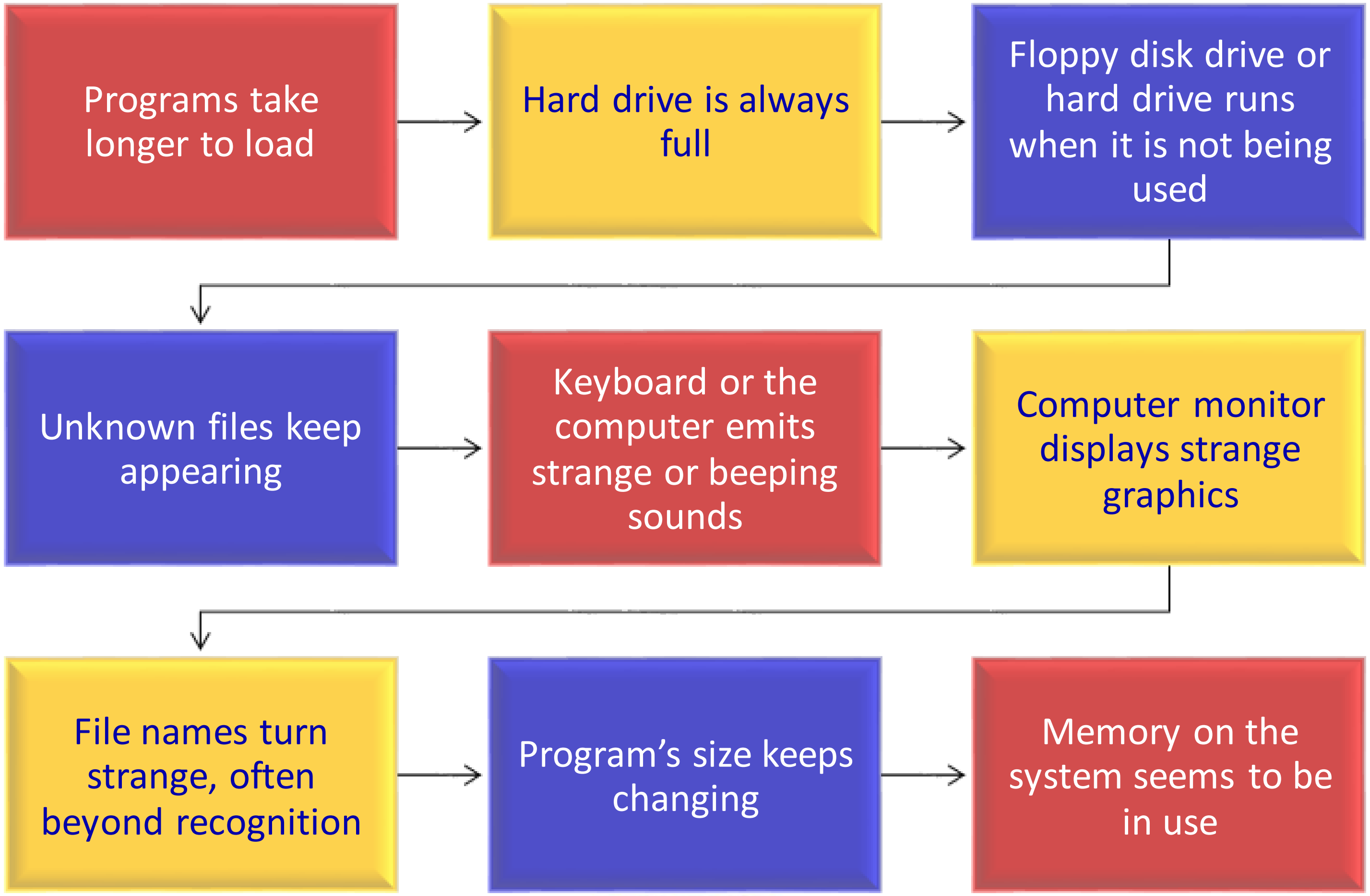
Objectives

- Identify the symptoms of a virus
- Describe how a virus works
- Describe how a computer gets infected by viruses
- Explain virus analysis
- Identify the types of viruses
- Describe the storage pattern of a virus
- Explain antivirus evasion techniques
- Identify virus detection methods and countermeasures

Symptoms of a Virus



Programs take longer to load

Hard drive is always full

Floppy disk drive or hard drive runs when it is not being used

Unknown files keep appearing

Keyboard or the computer emits strange or beeping sounds

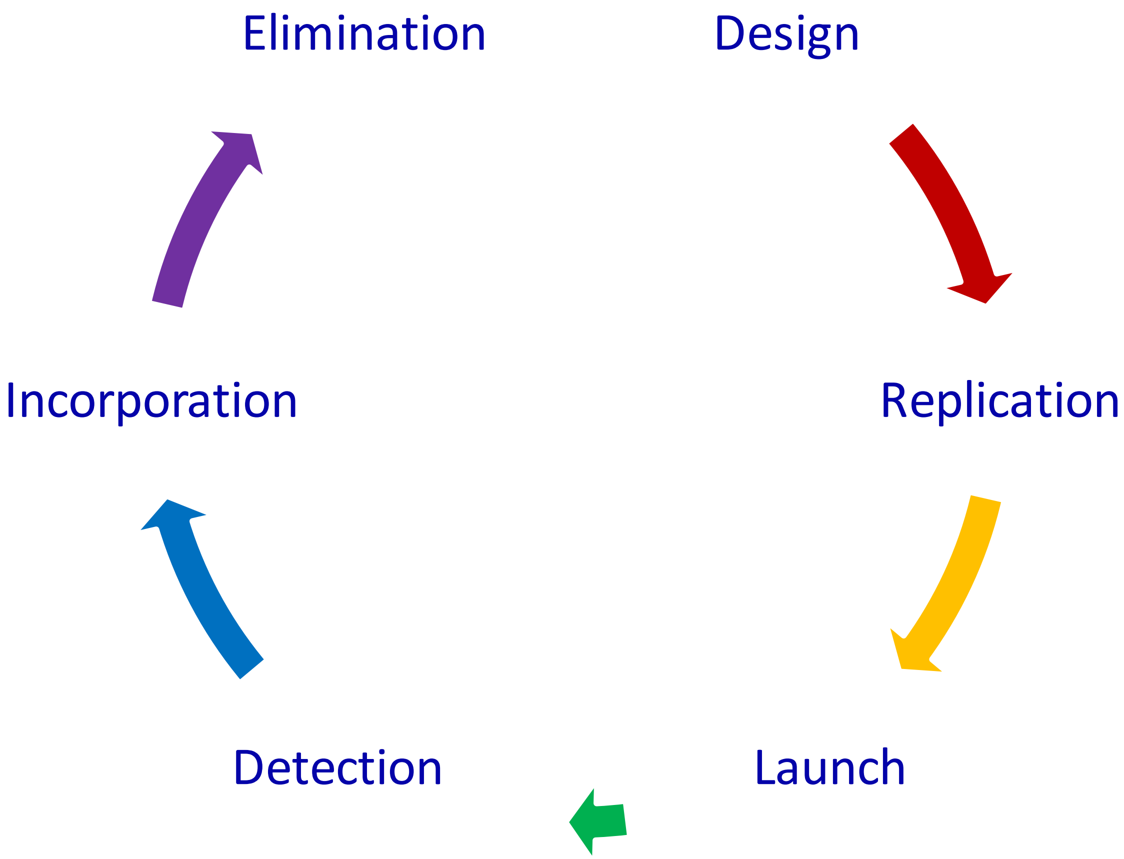
Computer monitor displays strange graphics

File names turn strange, often beyond recognition

Program's size keeps changing

Memory on the system seems to be in use

Stages of a Virus Life



Design

Replication

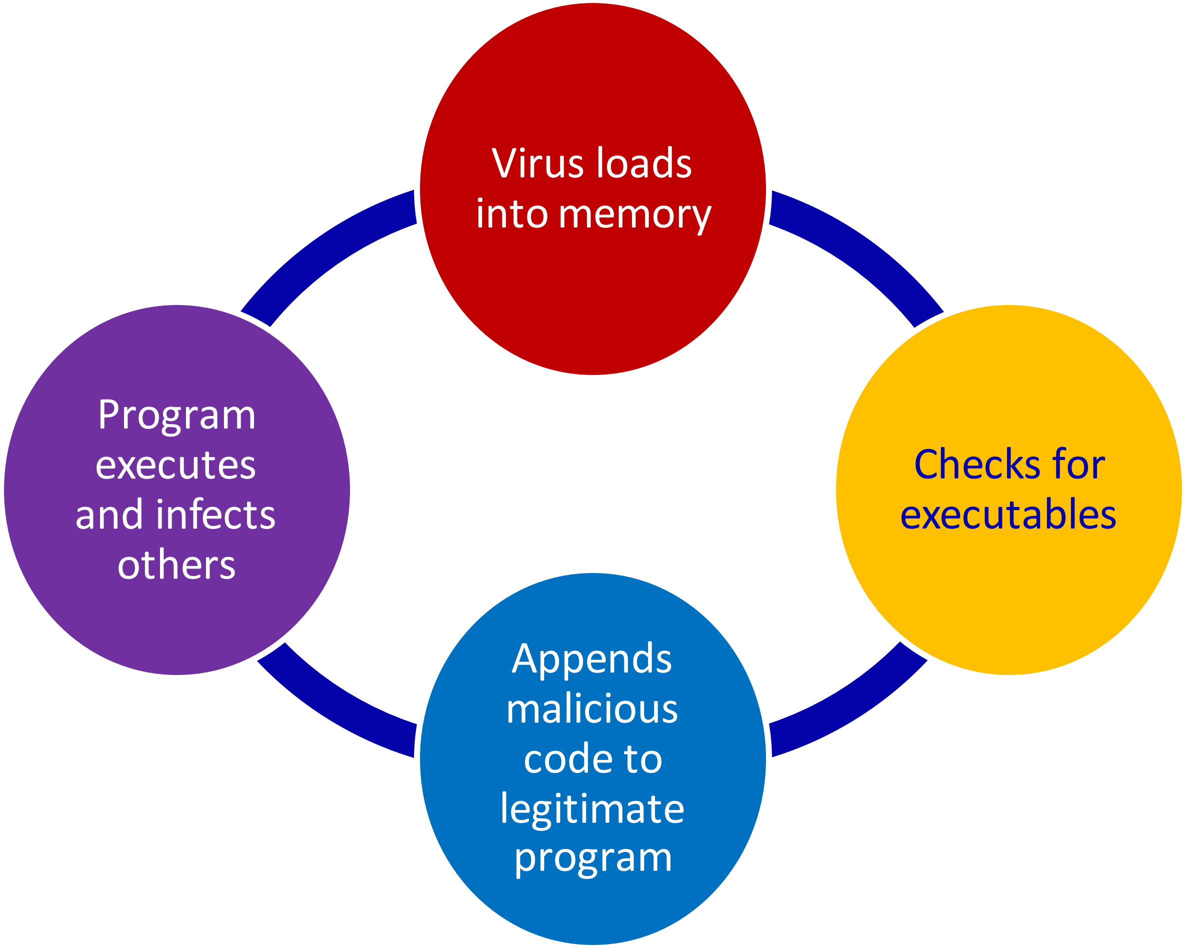
Launch

Detection

Incorporation

Elimination

Infection Phase



Virus loads into memory

Checks for executables

Appends malicious code to legitimate program

Program executes and infects others

Types of Viruses

Shell Virus

- Virus code forms a layer around the target host program’s code
- Original code moved to new location
- Virus assumes its identity

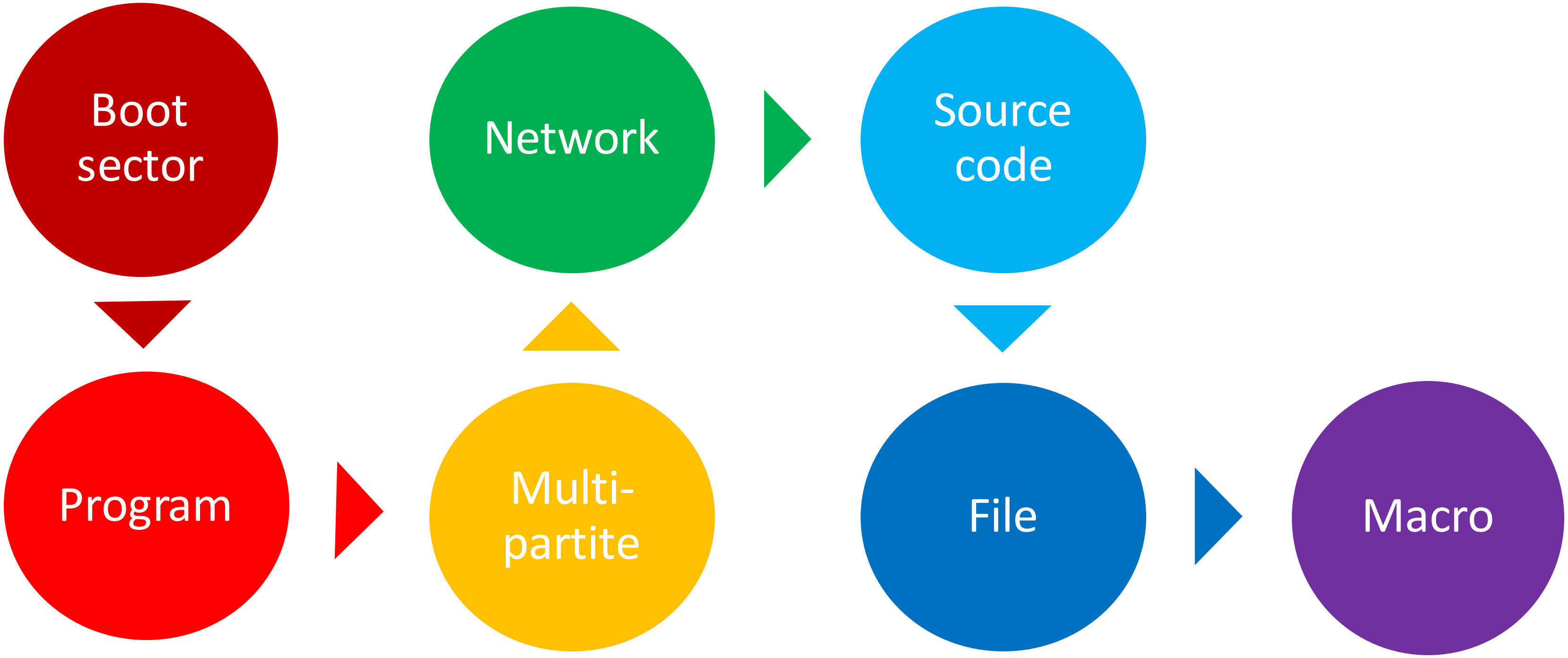
Add-on Virus

- Appends code to the beginning of the host code
- Virus code executed before host code

Intrusive Virus

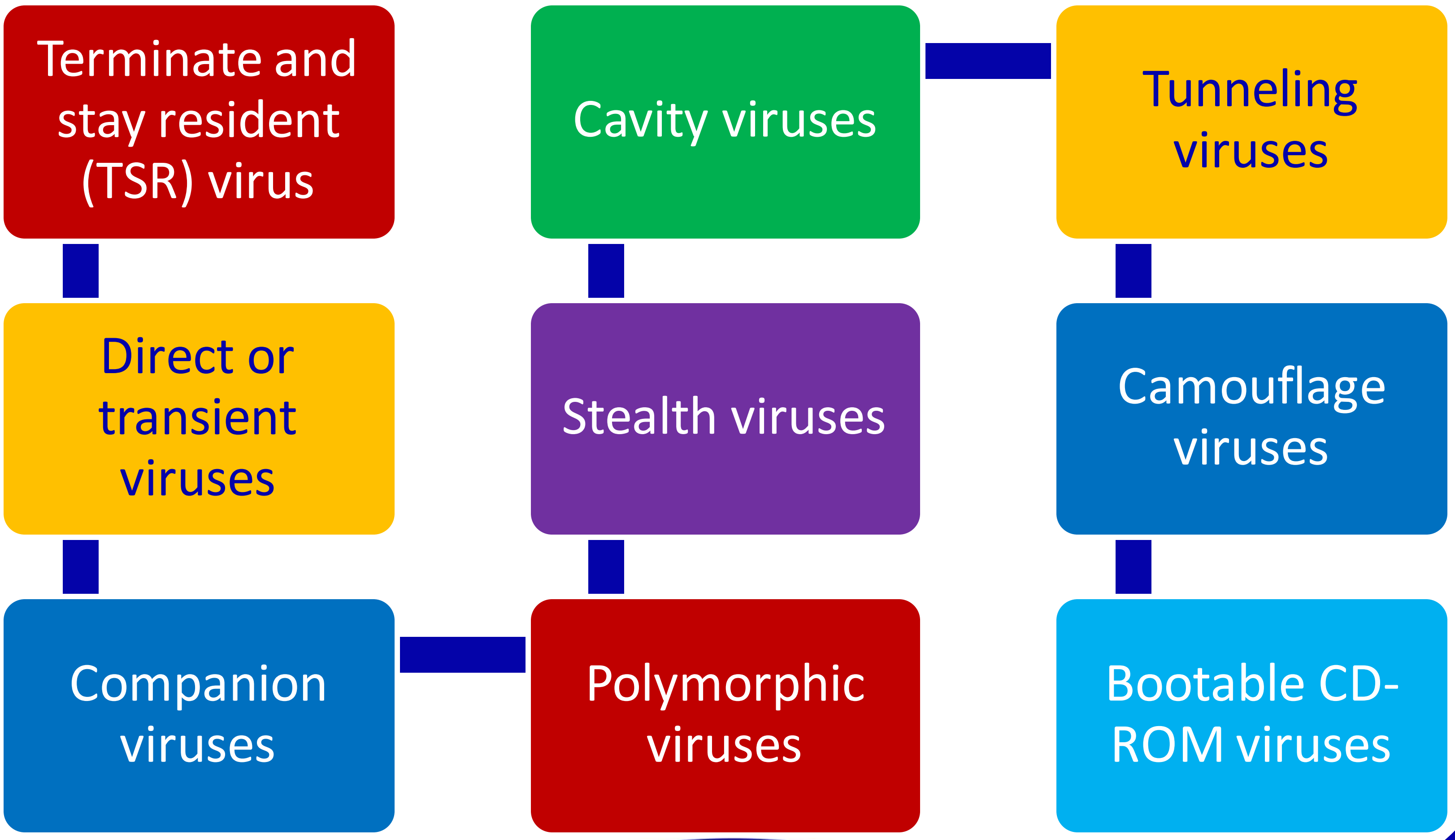
- Overwrites its code over host’s program code
- Original code does not execute properly

What Viruses Infect



https://en.wikipedia.org/wiki/Multipartite_virus

How Viruses Infect



Terminate and stay resident (TSR) virus

Direct or transient viruses

Companion viruses

Polymorphic viruses

Stealth viruses

Cavity viruses

Tunneling viruses

Camouflage viruses

Bootable CD-ROM viruses

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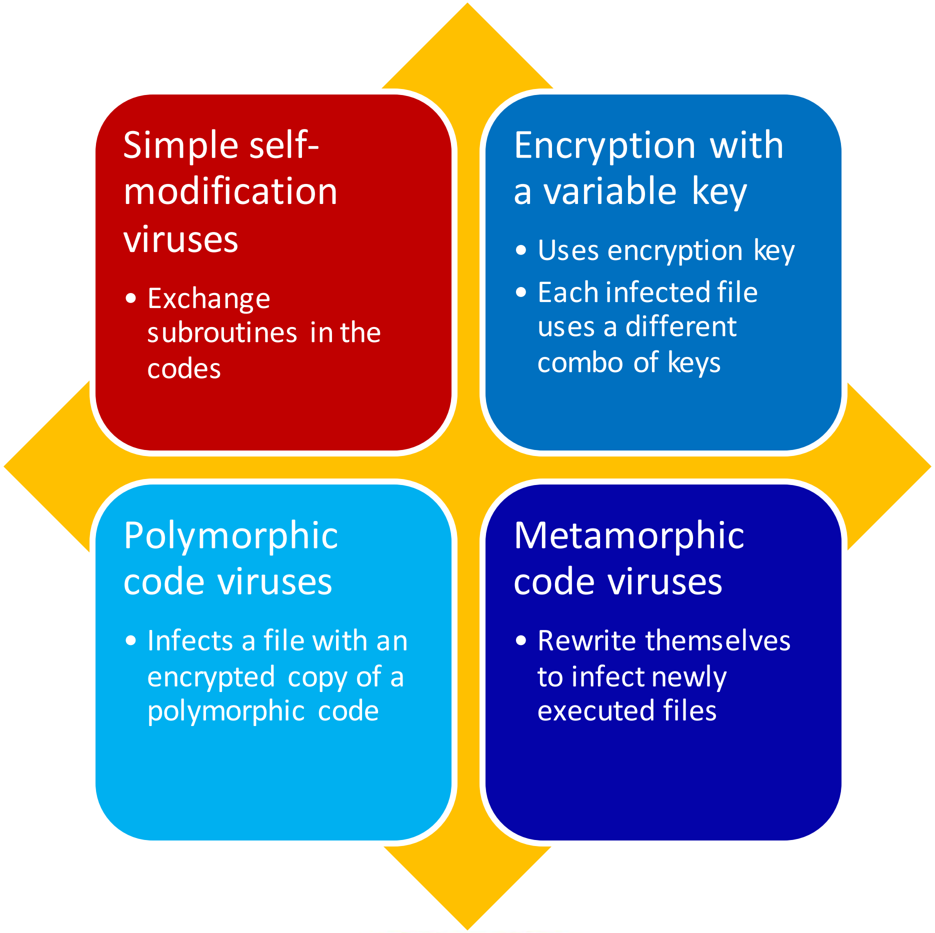
http://www.cknow.com/cms/vtutor/multipartite-viruses.html

Self-Modification Viruses



Simple self-modification viruses

- Exchange subroutines in the codes

Encryption with a variable key

- Uses encryption key
- Each infected file uses a different combo of keys

Polymorphic code viruses

- Infects a file with an encrypted copy of a polymorphic code

Metamorphic code viruses

- Rewrite themselves to infect newly executed files

Worst Computer Viruses

Melissa

Sasser & Netsky

Nimda

ILOVEYOU

Anna Kounikova

Storm Worm

SQL Slammer

MyDoom

Code Red

File Extensions

.ASP .REG

.LNK

.BAT

.COM

.DOT .MP3 .DLL

.SYS

.INI

.BIN .CSS .VBS

Countermeasures

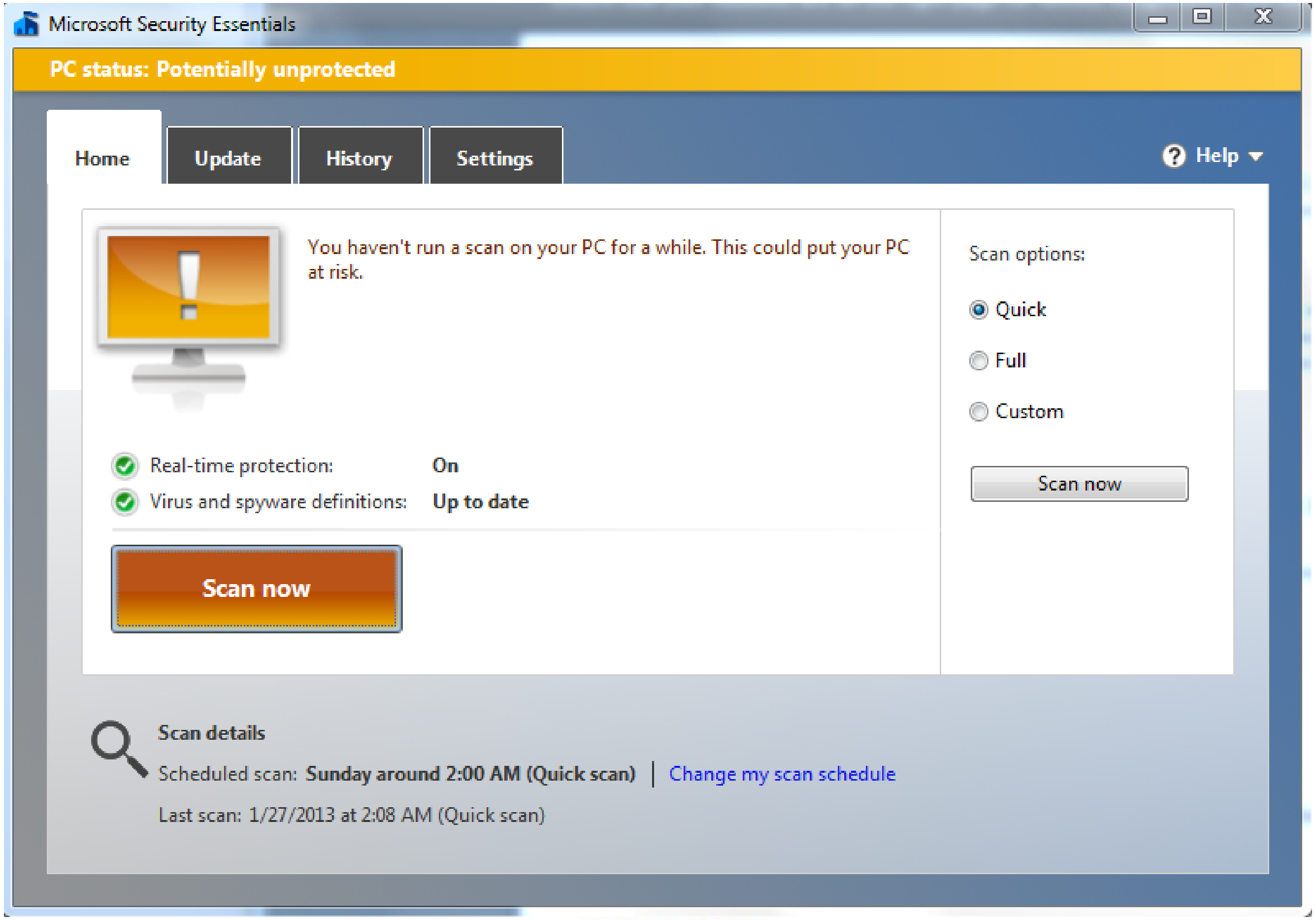
Detection Methods

- Scanning
- Integrity checking
- Interception

Incident Response

- Detect the attack
- Trace and map
- Detect payload
- Isolate vector
- Update system

Anti-Virus Software



Microsoft Security Essentials

PC status: Potentially unprotected

You haven't run a scan on your PC for a while. This could put your PC at risk.

Real-time protection: On

Virus and spyware definitions: Up to date

Scan options:

● Quick

○ Full

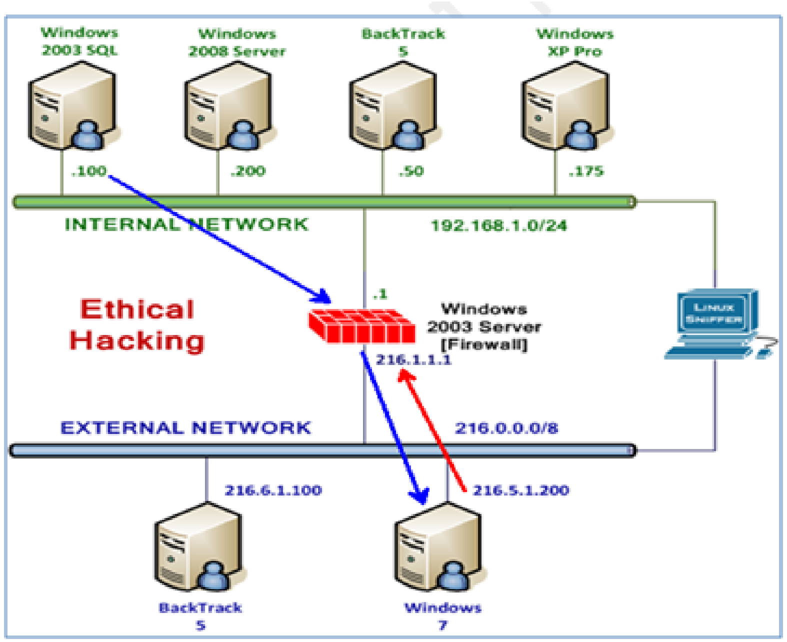
○ Custom

Scan details

Scheduled scan: **Sunday around 2:00 AM (Quick scan)** | Change my scan schedule

Last scan: 1/27/2013 at 2:08 AM (Quick scan)

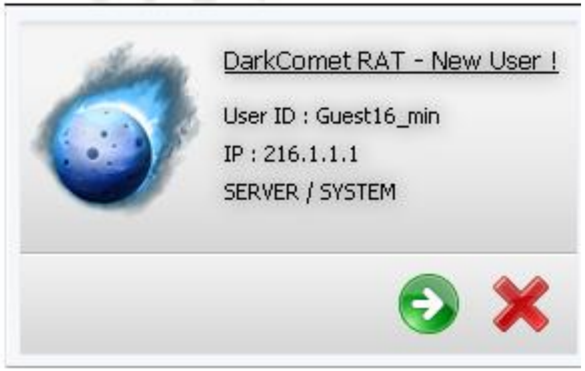
Utilizing Malware



- Windows 7 is using a public IP address on the WAN
- Windows 2003 SQL is NATed behind the firewall
- Firewall is redirecting traffic to SQL

DarkComet

SQL Injection provides a Dark Comet connection to your victim

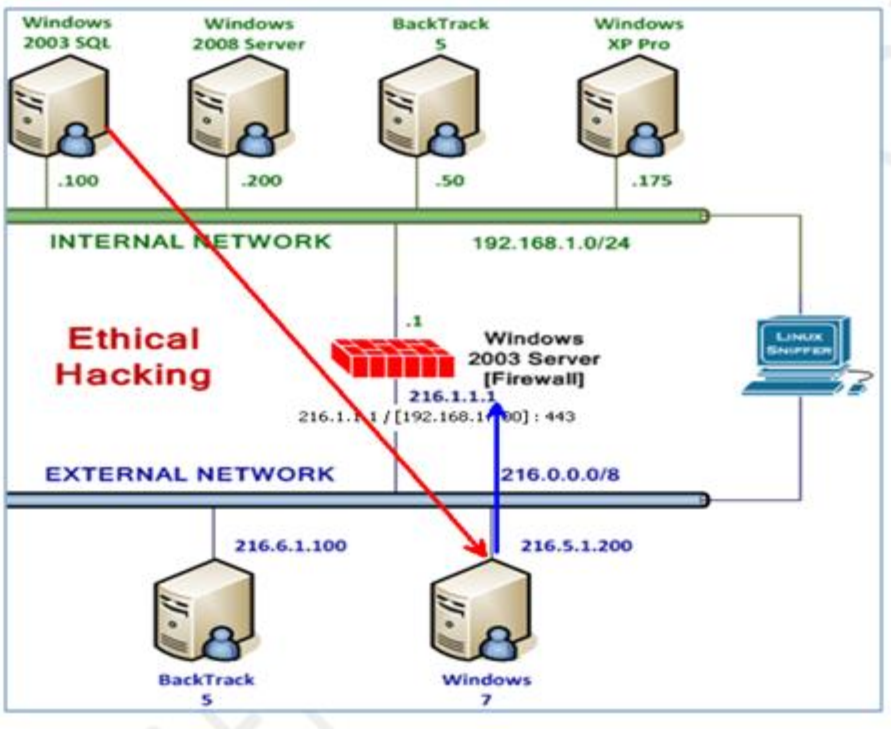


DarkComet RAT - New User !

User ID : Guest16_min

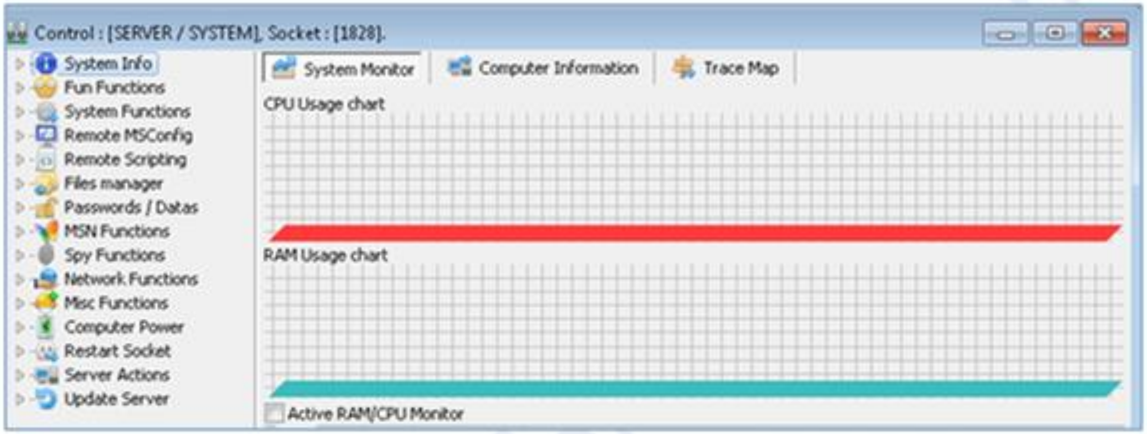
IP : 216.1.1.1

SERVER / SYSTEM



Exploit the Connection

Your connection to the victim machine offers a number of possible actions



☐ Active RAM/CPU Monitor

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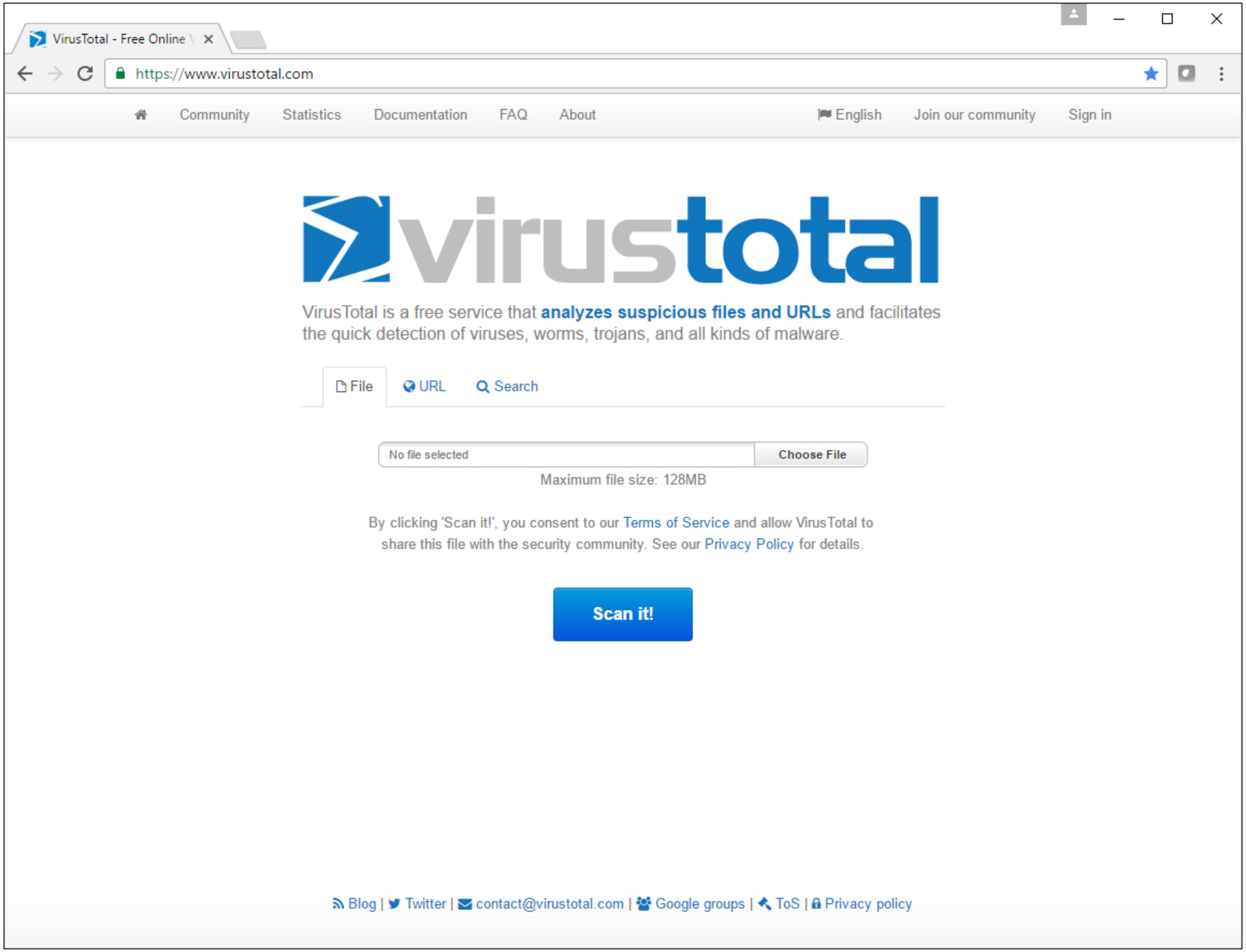
https://www.virustotal.com/



VirusTotal is a free service that **analyzes suspicious files and URLs** and facilitates the quick detection of viruses, worms, trojans, and all kinds of malware.

Maximum file size: 128MB

By clicking 'Scan it!', you consent to our Terms of Service and allow VirusTotal to share this file with the security community. See our Privacy Policy for details.

Scan it!
Blog | Twitter | contact@virustotal.com | Google groups | ToS | Privacy policy

Domain 8

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Domain 8

Sniffers

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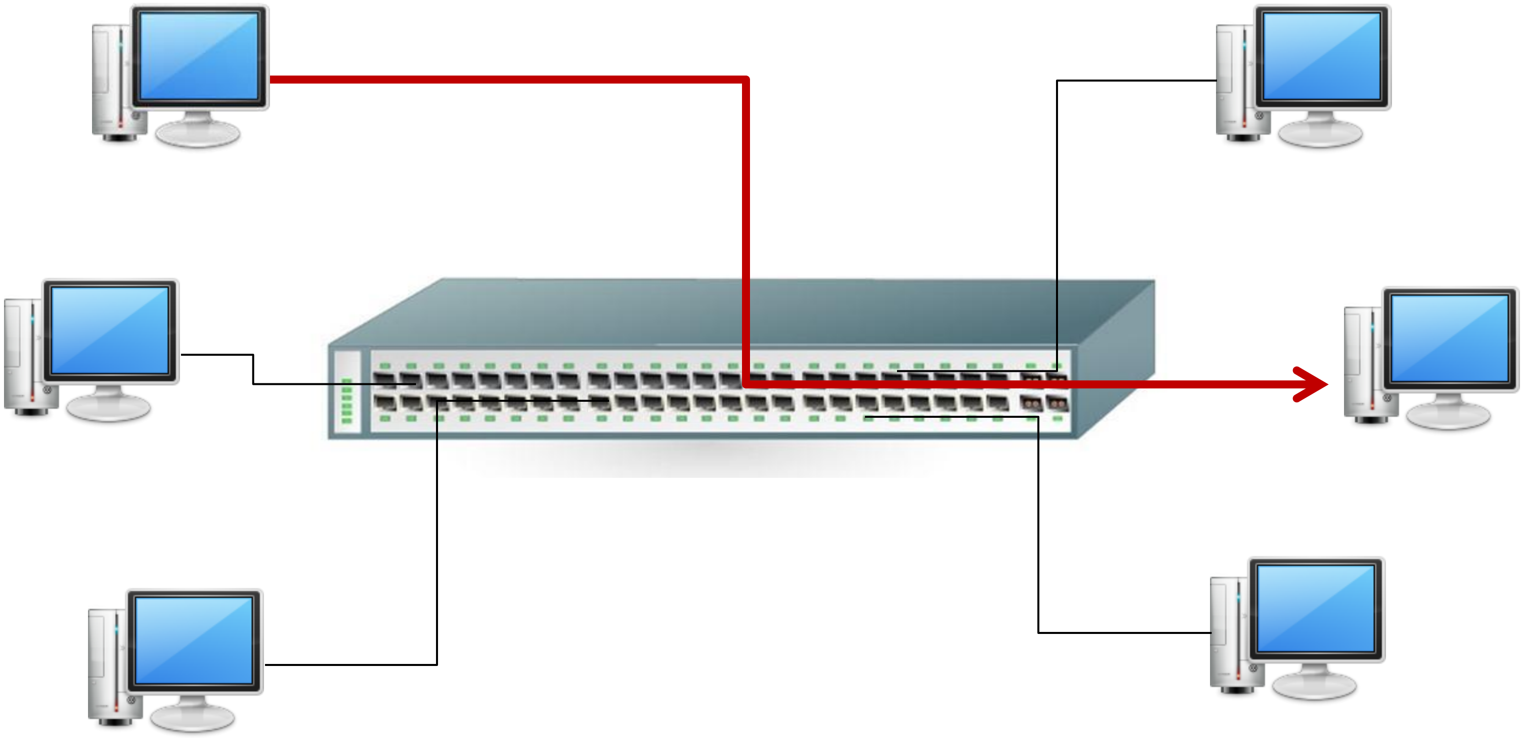
Objectives

- Identify types of sniffing
- Identify protocols vulnerable to sniffing
- Explain types of sniffing attacks
- Detect sniffing
- Implement countermeasures for sniffing

Switched Ethernet

Switch maintains a table of MAC addresses



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Types of Sniffing

Passive

- Common on networks with hubs
- Data is gathered from all machines connected

Active

- Switches actively monitor the MAC address on each port
- Inject traffic into the LAN to enable sniffing of traffic

Active Sniffing

ARP Spoofing

- ARP is stateless
- Attacker sends fake ARP messages to associate the attacker's MAC address with the IP address of another (like the default gateway)

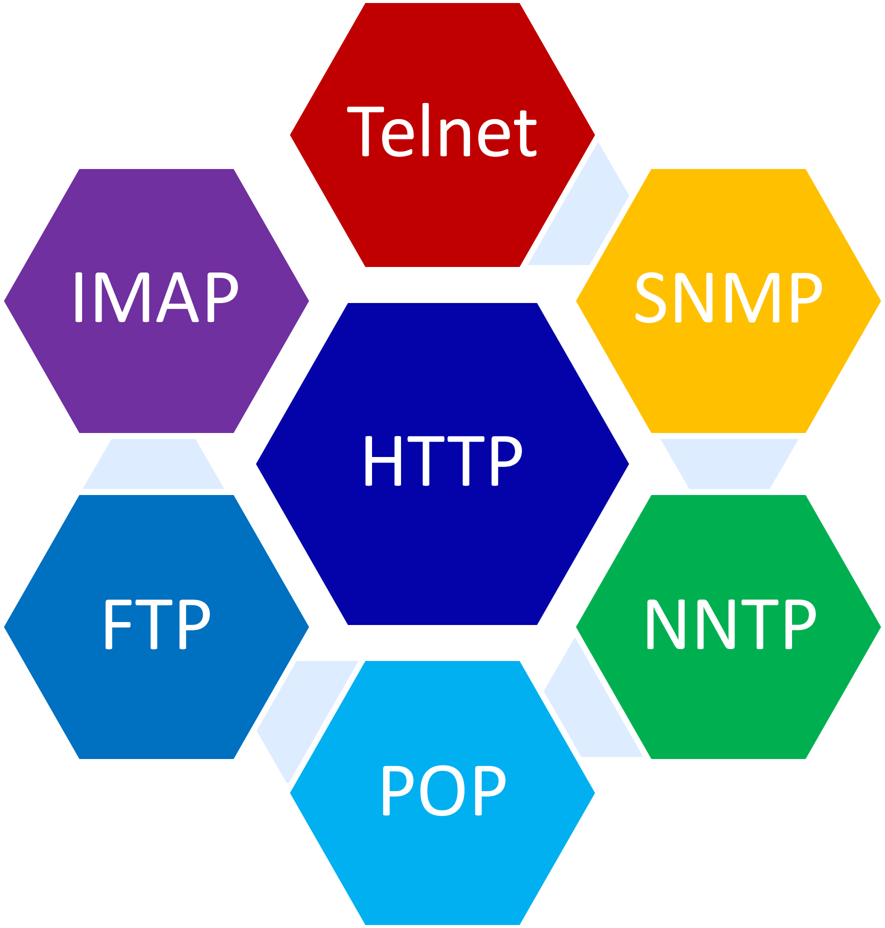
MAC Flooding

- Used to compromise a network switch
- Attacker floods a switch with many Ethernet frames with different MAC addresses to consume the resources set aside to store the MAC address table

MAC Duplicating

- Sniff network for MAC addresses of clients that associate with a switch port
- Reuse one of those addresses

Protocols Vulnerable to Sniffing



Electronic Surveillance

Authorized by a judicial administrative order

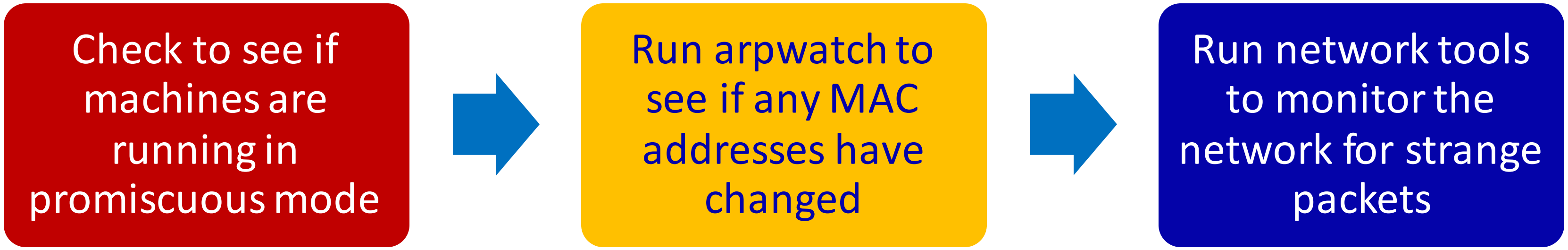
Uses a wiretap

Target's service provider is responsible for intercepting data communications

Mediation devices handle the processing

Wireshark, Tcpdump are examples of tools used

How to Detect Sniffing



Check to see if machines are running in promiscuous mode

Run arpwatch to see if any MAC addresses have changed

Run network tools to monitor the network for strange packets

Methods for Detecting Sniffers

Ping Method

- Sniffer can be detected by sending a packet to the IP address of a machine, but not its network adapter

ARP Method

- A system responding to a non-broadcast IP address request is suspected of running a sniffer

Source-Route Method

- Uses a technique known as the loose-source route

Decoy Method

- Decoy client and server used

Reverse DNS Method

- Send ICMP requests to a nonexistent IP address to monitor reverse DNS lookups
- The computer responding to the ping is hosting a sniffer

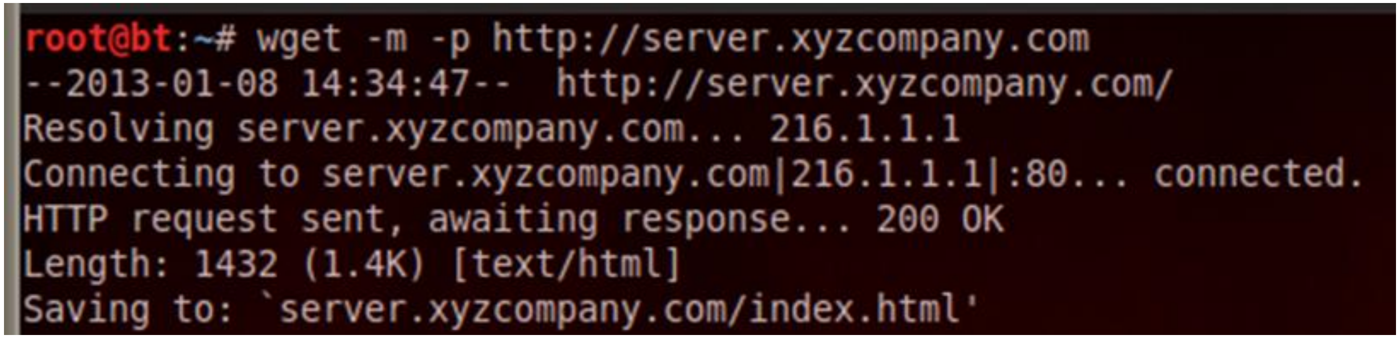
Latency Method

- Excess data packets sent to overload the sniffer’s memory
- Ping computers on the network

The National Information, Security & Geospatial Technologies Consortium

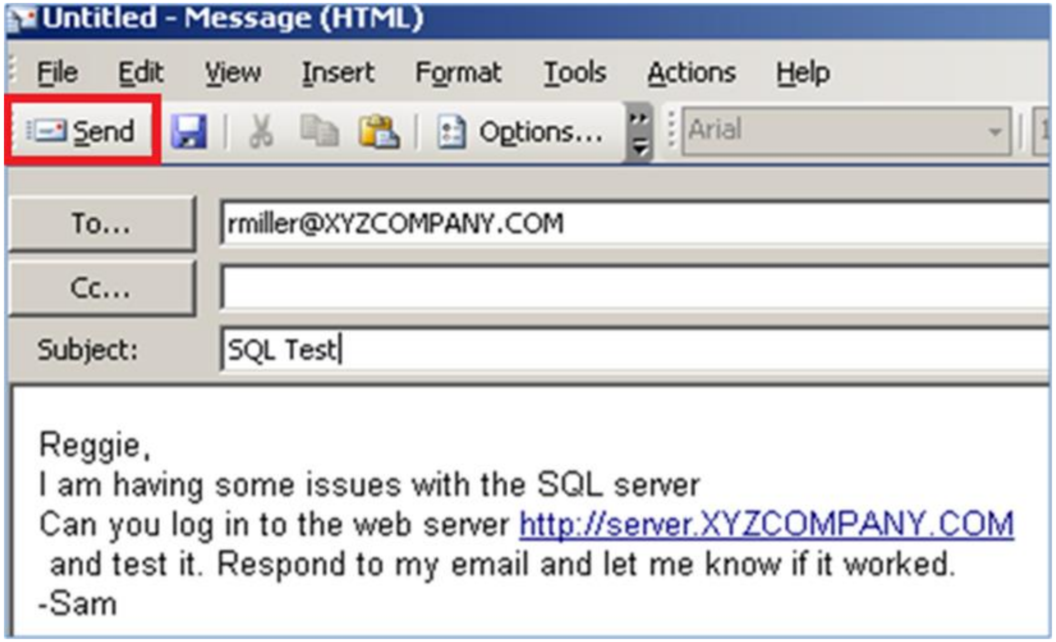
http://www.just.edu.jo/~tawalbeh/nyit/incs745/presentations/Sniffers.pdf

Wget



```
root@bt:~# wget -m -p http://server.xyzcompany.com
--2013-01-08 14:34:47--  http://server.xyzcompany.com/
Resolving server.xyzcompany.com... 216.1.1.1
Connecting to server.xyzcompany.com|216.1.1.1|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1432 (1.4K) [text/html]
Saving to: `server.xyzcompany.com/index.html'
```

Spearfish Attack



Untitled - Message (HTML)
File Edit View Insert Format Tools Actions Help
Send
Options...
Arial
To...
Cc...
Subject:

To: rmiller@XYZCOMPANY.COM

Subject: SQL Test

Reggie,
I am having some issues with the SQL server
Can you log in to the web server http://server.XYZCOMPANY.COM
and test it. Respond to my email and let me know if it worked.
-Sam

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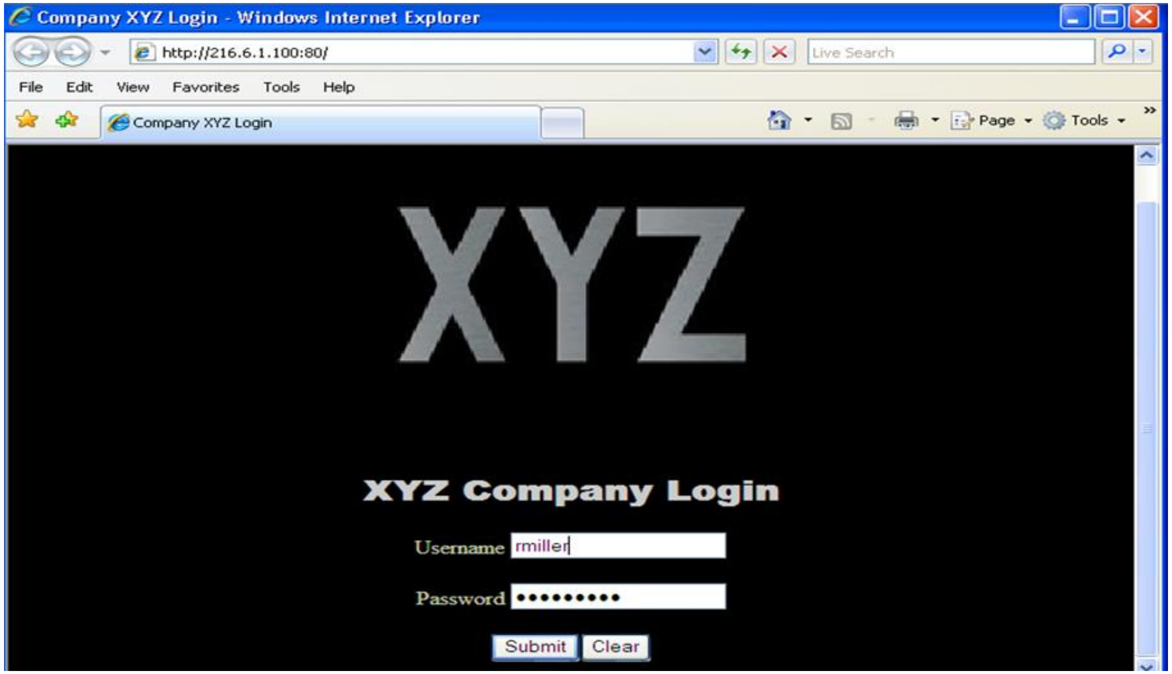
Viewing Credentials

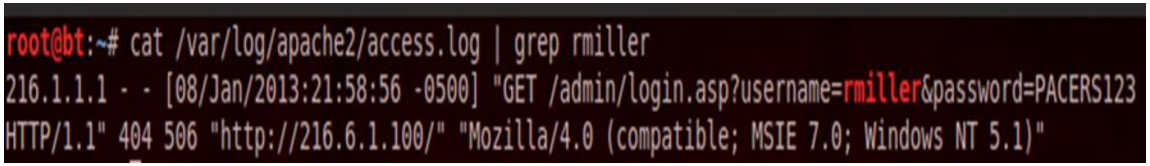


http://216.6.1.100:80/

XYZ Company Login

Username rmiller

Password ••••••••••



```
root@bt:~# cat /var/log/apache2/access.log | grep rmiller
216.1.1.1 - - [08/Jan/2013:21:58:56 -0500] "GET /admin/login.asp?username=rmiller&password=PACERS123
HTTP/1.1" 404 506 "http://216.6.1.100/" "Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1)"
```

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Assignment

No Lab assignment this week

Test next week

Practice test available on Canvas

Wrap up

Next Class

Assignment: Check the Calendar Page on the web site to see what is due next week.

No Quiz

No Lab due

Test !

Backup