SIGPwny @ UIUC

Fall 2017

“A computer lets you make more mistakes faster than any other invention with the possible exceptions of handguns and Tequila.” - Mitch Ratcliffe

Announcements

- New members - welcome!
- Old members - welcome back!
- CSAW Quals are next weekend
  - September 15th - 17th

News Over the Summer

- WannaCry
  - EternalBlue
  - MalwareTech
- NotPetya
  - SMBv1
  - Maersk
- MalwareTech Arrested at Defcon
  - Kronos
- Ethereum Hack
- Voting Machine Village

News of the Week

- Massive Equifax Breach
- Intelligence Community Job Applications Leaked
- FCC Fixed “Free Hosting” Bug
- Recall of Insecure Pacemakers
- Trove of Spam Credentials Discovered
- Arris Modem Backdoors
- Kaspersky Reporting on Russian Intelligence

What we did this Summer

- Stan - Researched ATM Pin Hijacking Techniques
- Ian & Paul - Exploited Router Firmware Bugs
- Eric - Built Visualization Tools for Binary Ninja
- JP & Will - Underhanded Crypto
- Ariel - Reverse Engineering and Analysis of Android Internals

Chairs

- Alex
- Adam
- J.P.
- Eric

What is SIGPwny?

- Special Interest Group focusing on offensive cyber security
- We like
  - Exploitation
  - Reverse Engineering
  - Network Security
  - Cryptography
  - Physical security

Our Goals

- Generate interest and raise awareness in cyber security
- Develop hands-on skills
- SORF a pony
- Win CTFs and other cyber security events
- Get you a job!

What You Should NOT Expect

- To become an expert in one semester
- To learn about every security topic in depth

Background knowledge

- Only “requirement” is an interest in security
- Basic programming knowledge is useful
- These things will also help
  - Operating system internals
  - Networking
  - Assembly languages
  - Scripting
  - Web stuff

What you'll need

- Laptop
- Linux VM
  - We recommend Kali or Ubuntu
- A desire to break things :)

Topics

- Physical Security
  - Lockpicking
- Web
  - SQL Injection, XSS, Directory Traversal, CSRF, Authentication Bypass
- Reverse Engineering
  - ~~IDA Pro~~ ~~Binary Ninja~~ R2, Debuggers, x86, MIPS, ARM, Bug hunting
- Exploitation
  - Buffer Overflows, Shellcoding, ROP, Use after free
- Malware
  - Reversing, Rootkits, Post exploitation, Evasion, Persistence
- Network security
  - Wireshark, Metasploit, Nmap, Pentesting, Cobalt Strike
- Hardware
  - Embedded devices, firmware extraction and modification, exploitation
- Crypto
- Mobile
- Puns
- Radare2 memes

Careers in Security

- Vulnerability Researcher
- Reverse Engineer
- Penetration Tester
- System Administrator
- Security Software Developer
- Forensics and Incident Responder

Where SIGPwny people end up

- Trail of Bits
- Raytheon Si
- Air Force Research Lab
- Sandia National Lab
- MIT Lincoln Lab
- FireEye
- ViaSat
- OPS Solutions (Startup)
- NCC Group
- Mitre
- SPRAI/NSRG
- ~~Prison~~

Communication

- UIUC SIGPwny
  - https://www.facebook.com/groups/439995656109426/
- Mailing List
  - https://www-s.acm.illinois.edu/mailman/listinfo/sigpony-l
- Website
  - http://sigpwny.github.io/
- IRC
  - #sigpwny irc.Freenode.net

Meetings

- 6-7:30 pm, Thursdays
- Meetings include:
  - News of the Week
  - Recap of previous week
  - Mini tech talk
  - Lecture, demo, tutorial
  - Exercises and challenges

Focus groups

- Pentesting/Network Exploitation Lab
- Exploits and Vulnerabilities Group
- Embedded Device Hacking
- CTF Practice
- Malware Analysis and Reversing
- Semester Project (TBD)
- Start your own!
  - Cloud/Software Defined Networking Security
  - VR on Scada, industrial controls.
  - ROP defense / UC Irvine

Capture the Flag (CTF)

- “Capture the Flag”
- Security competition
  - Jeopardy Style
  - Attack and Defend
- CSAW Quals
- UIUCTF

Useful Resources

- https://trailofbits.github.io/ctf/
- https://exploit-exercises.com/
- http://opensecuritytraining.info/
- http://io.smashthestack.org/
- https://microcorruption.com/login
- http://overthewire.org/wargames/
- http://captf.com/
- https://www.nostarch.com/
- https://www.owasp.org/index.php/Main_Page
- http://mynameisg.us/login
- http://www.hackthissite.org

Social Events

- Real life Capture the Flag
- Movie night
  - Hackers
  - Swordfish
  - The Imitation Game
- Barcrawl?
- LAN party
  - Quake
  - Unreal Tournament
  - Starcraft
  - TF2
  - CS: GO
- Tshirt???

Want more security news?

- Reddit
  - /r/netsec
  - /r/reverseengineering
  - /r/malware
  - /r/crypto
  - /r/securityctf
- Google Project Zero, Online Security Blog
- http://www.darkreading.com/
- http://krebsonsecurity.com/
- https://www.schneier.com/
- http://www.zdnet.com/blog/security/
- SANS
  - Internet Storm Center
  - Mailing Lists - @RISK and NewsBites
- Hacker News
- Lobsters
- Full Disclosure
- Twitter

Security Classes at UIUC

- CS 460: Security Lab
  - Hands on security lab
- CS 461: Computer Security I
  - Security basics, definitions, hands-on MPs
- CS 463: Computer Security II
  - More research-y security, emphasis on privacy and information
- CS 498: Digital Forensics
  - Digital evidence, legal, file recovery
- Various 498/598 Courses

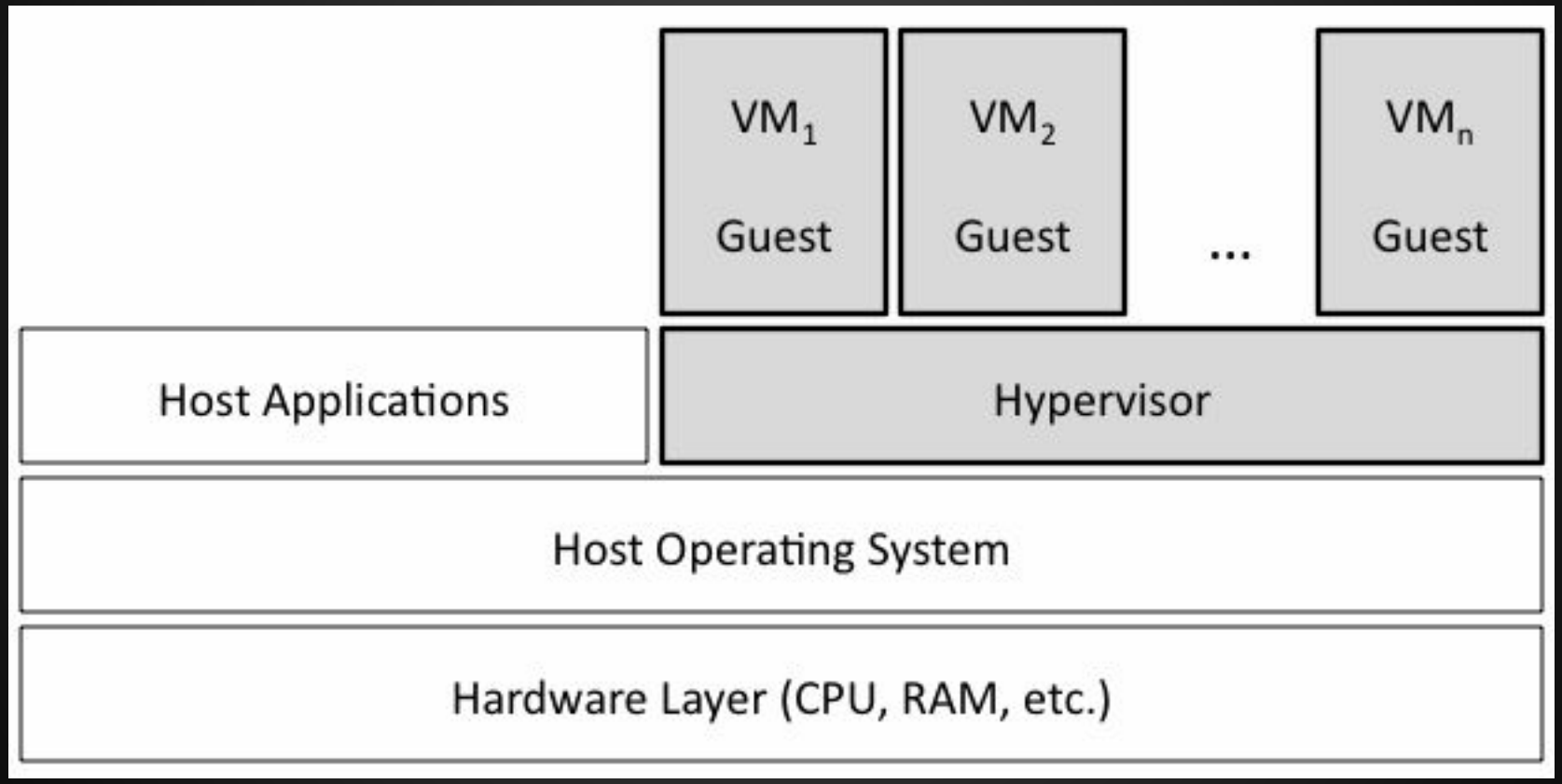
Questions?

Next week's meeting: CSAW Prep CTF

Setting up a Virtual Machine

- Isolate guest OS from host OS
- Can use different OS's
- Snapshot and restore virtual machine state

Setting up a Virtual Machine



Setting up a Virtual Machine

- Windows, Linux, OS X
  - VirtualBox
  - VMWare
- OS X
  - Parallels
  - BootCamp
- Masochists
  - QEMU