

Welcome to Systems Security! (SysSec)

Systems Security - Fall 2020



SecDev Introduction!

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UBNetDef At A Glance

ubnetdef.org

- Systems Security (SysSec) - <https://ubnetdef.org/courses/syssec/>
- Network Security (NetSec)
- Security Development (SecDev)
- Security Scripting
- Everyone participates in Lockdown!



Lockdown

- A cyber security competition hosted by UBNetDef, and set up in a defense only, Red vs Blue format.
- Focuses on Security, System Administration, problem solving and teamwork!
- Designed to be a beginner to intermediate skill level.



What Will We Learn in SysSec?

- Virtualization
- Networking
- Windows
- Linux
- Firewalls
- Penetration Testing

... and much more!

Resources





Homework

- Due the following Friday at 11:59 pm.
- Assignments posted on and submitted through UBLearn.
- Submission in PDF format ONLY.



Mattermost

- 24/7 Office Hours.
- Primary mode of communication between you and SecDev and a way for you to ask us questions.
- Responses are quick throughout the day.
- Feel free to DM a SecDev member.
- Please post general questions in the SysSec chat.



Mattermost!!

ARE YOU ON MATTERMOST YET?





Virtual Machines

- VMs are used to create your own infrastructure where you will learn how computers interact over a network
- We host this all on servers that we manage in Davis Hall
- Will be used for the bulk of homework assignments.
- Server: cdr-vcenter.cse.buffalo.edu
- [Off-campus? Use a VPN!](#)



Grading

Component	Percentage of overall grade
Attendance	15%
Weekly Projects	50%
Final Project	15%
Lockdown	15%
Extra Competition	5%
Total	100%



Grading Scale

Letter grade	Percentage
A	≥ 93%
A-	≥ 90%
B+	≥ 87%
B	≥ 83%
B-	≥ 80%
C+	≥ 77%
C	≥ 73%
C-	≥ 70%
D	≥ 65%
F	<65%



Attendance

- ubnetdef.org/attendance
- Attendance is taken weekly and we appreciate any feedback you have for us!

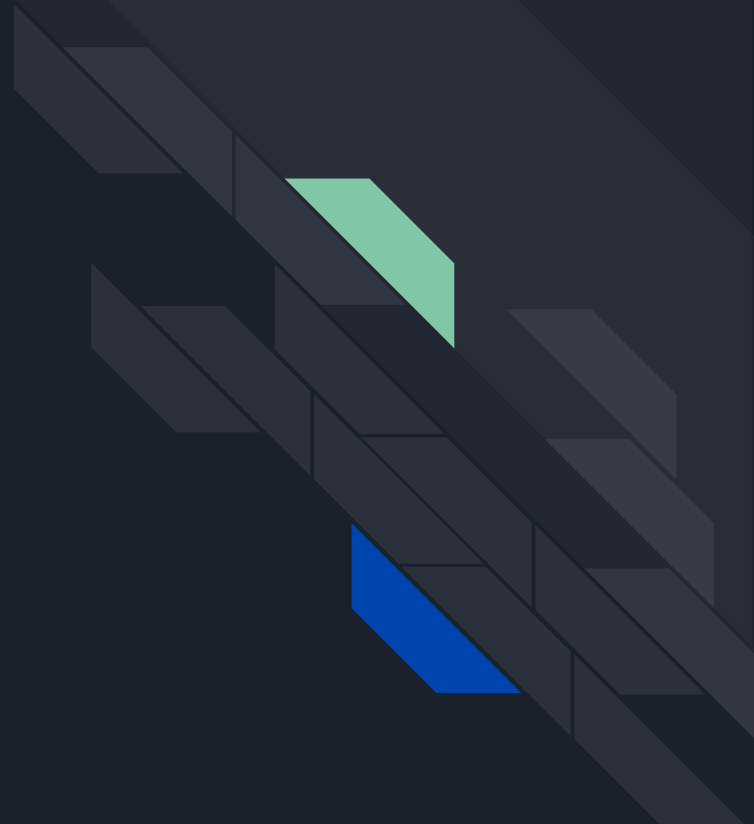
3 Goals of NetDef



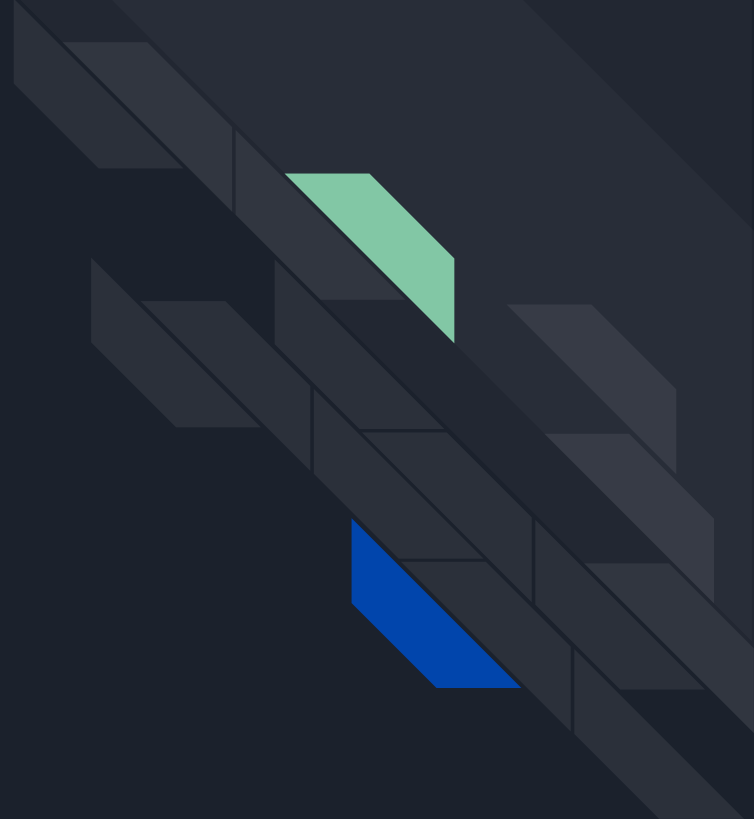
1. Have Fun!



2. Learn

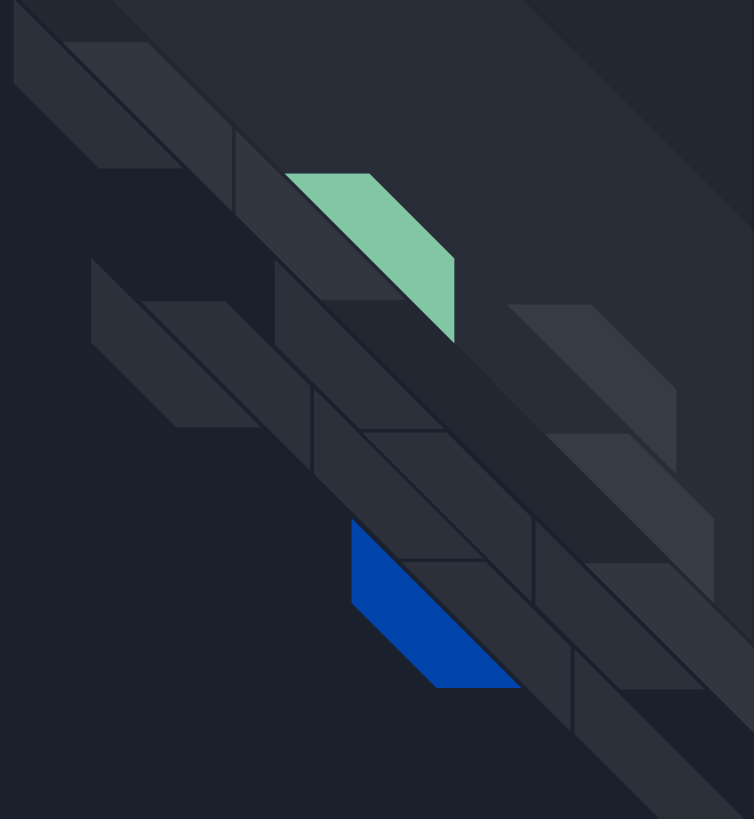


3. Don't Give Up!



Questions?

(1000 Mile Overview Next)





Virtualization



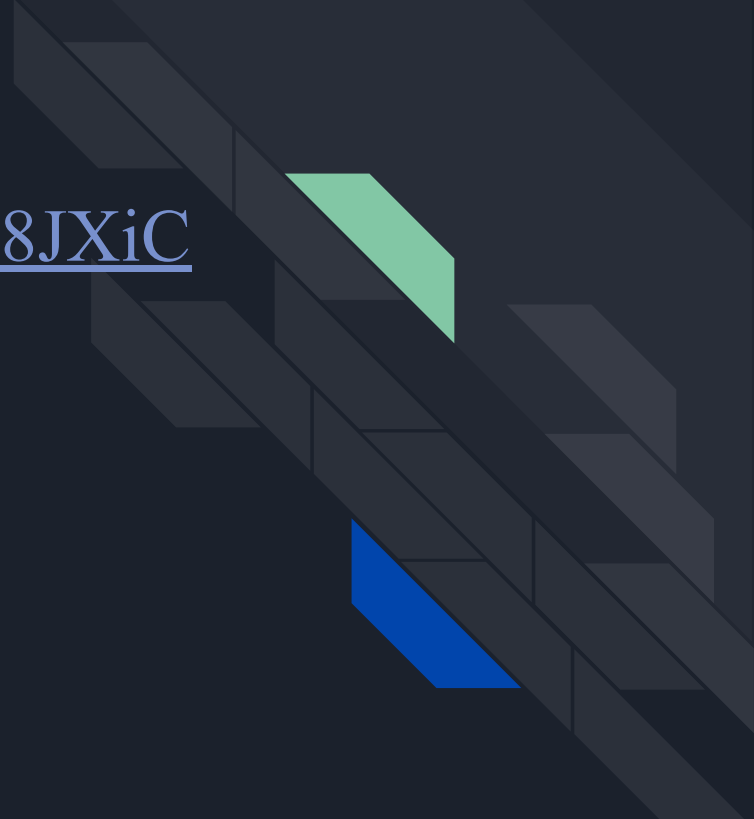
**WHAT IF I TOLD
YOU**

**THAT YOU CAN RUN A COMPUTER INSIDE
YOUR COMPUTER!**

meme-generator.net

<https://www.youtube.com/watch?v=o8JXiC>

YNuDo



System Resources





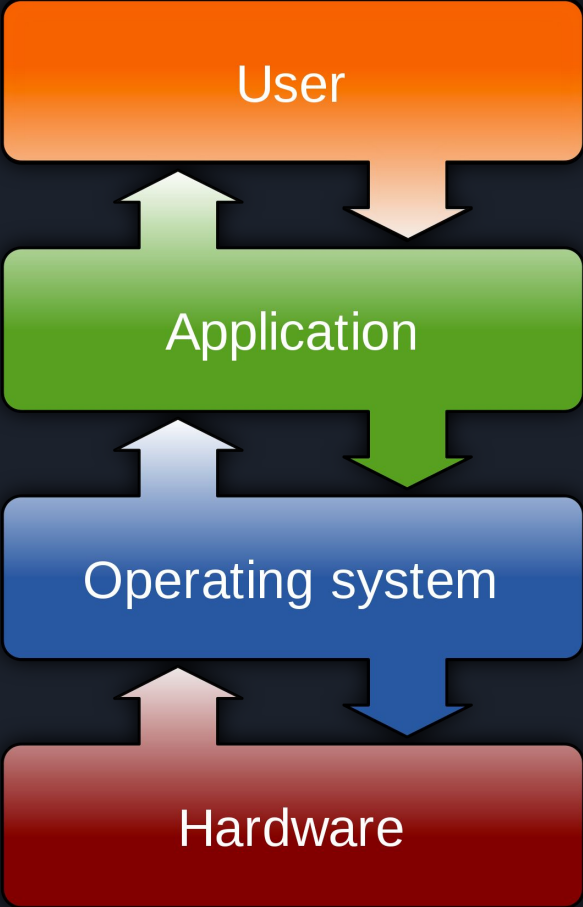
Hardware

- Physical components that a computer system requires to function.
- Easy to change out and upgrade.
- Large determinant of how fast your computer operates.
- Software is the programming that tells all these components what to do.

Operating Systems

- The primary software that manages all the hardware and other software on a computer.
- Launches and manages applications.
- Common examples includes Windows, Ubuntu and Mac OS.







Other Components

- Central Processing Unit (CPU)
 - carries out instructions of a computer program, executing code.
- Random Access Memory (RAM)
 - A form of computer storage that stores data and machine code currently being used.
- Disk - permanent storage, slower than RAM.
- I/O - means for humans to interact with computers.



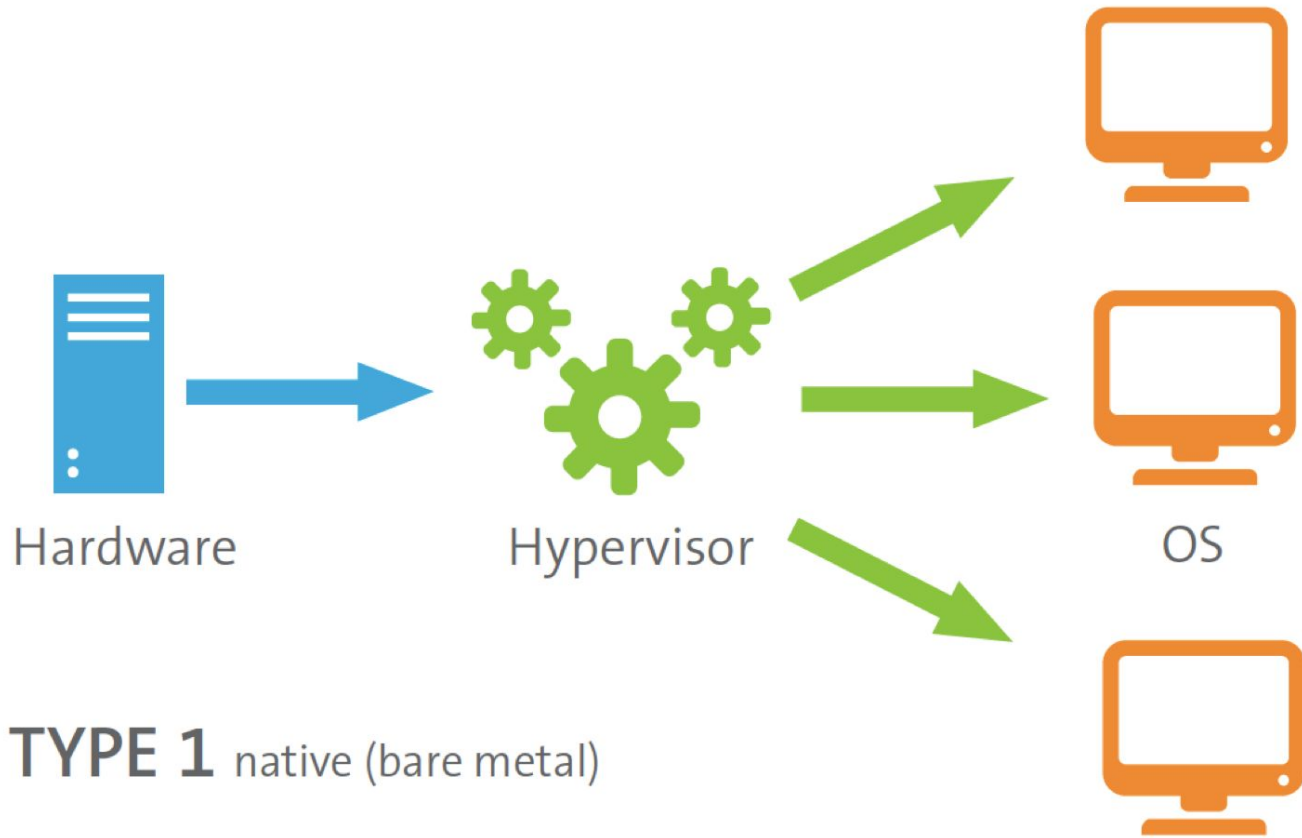
What Is Virtualization?

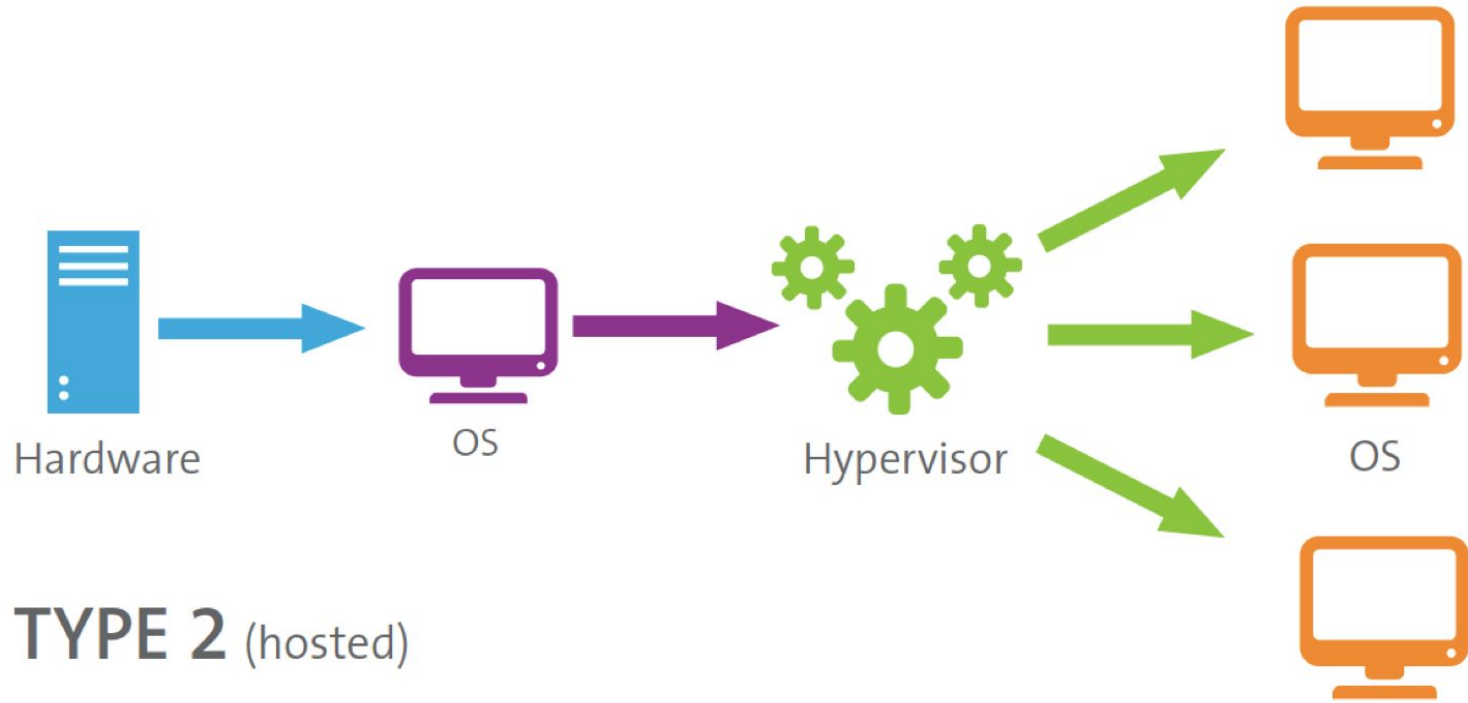
- Virtualization is the process of creating a software-based, or virtual, representation of something, such as virtual applications, servers, storage and networks.
- This practice allows IT organizations to operate multiple operating systems, more than one virtual system and various applications on a single server.
- Most effective way to reduce IT expenses while boosting efficiency and agility.
- Allows you to use a physical machine's full capacity by distributing its capabilities among many users or environments.



How Does Virtualization Work?

- With the help of a Hypervisor.
- Hypervisor - a software used to create Virtual Machines (VMs).
- What does it do?
 - Creates and runs virtual machines.
 - Divides resources and allocates them to each VM.
 - Isolates each guest so that it doesn't affect other guests or the host.





TYPE 2 (hosted)



Vocab

- Virtual Machine - a software computer comprised of configuration files and backed by the physical resources of a host
- Hypervisor - A Hypervisor is an OS that separates a computer's operating system and applications from the underlying physical hardware
- Host System - OS installed on physical hardware
- Guest System - Virtualized OS on top of Host System



Why Use Virtualization?

1. Security - VMs separate applications interfering with each other
2. Testing - open unknown or potentially malicious files without harming your computer
3. Learning - try out new programs without worrying about the results.
4. Resource Optimization - use the resources on hand more efficiently

And much more..

Reminder!!

