

# Linux Services

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Week 6

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# Agenda - Week 6

1. Review
2. Understanding Services
3. Protocols
4. Hands On: DB
5. Roles of a Wiki
6. Hands On: Web Server



# Why are we here?

- ⬡ Build your own Wiki
- ⬡ Configuring and managing services to split up tasks for one end goal

## Remember...

- Endpoints/Hosts
  - Clients
  - Servers
    - AD (Windows Server)
    - pfSense GUI Application
      - Web Server that lives on your router hardware
- Local
  - Open pfSense, 8 (Shell), pfctl -d
- Remote
  - Create default deny all firewall rule in pfSense GUI

## Remember...

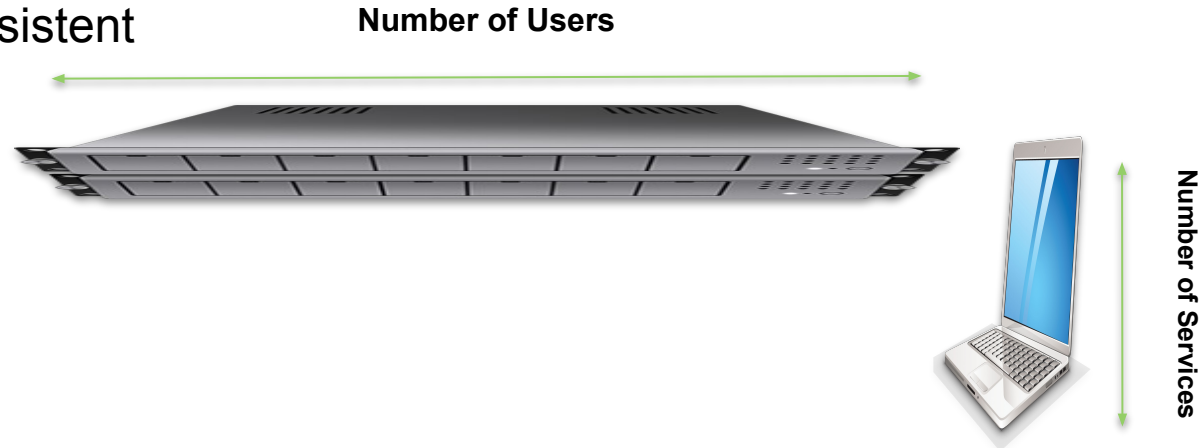
- Endpoints/Hosts
  - Clients
    - Windows, Ubuntu, Kali (Offender)
    - System you're using (Host)
  - Servers
    - AD (Windows Server)
    - pfSense GUI Application
      - Web Server that lives on your router hardware
- Local
  - Open pfSense, 8 (Shell), pfctl -d
- Remote
  - Create default deny all firewall rule in pfSense GUI

# What are Services?

- Services vs Processes
  - Process: you control when it starts and stop
    - Installing VMWare Tools
    - Starting Rocket League
  - Services: continuous and always running
    - pfSense GUI
- Today we're discussing and using services

## Who has the Services?

- Client
  - Runs scores of services for a strictly limited amount of users
- Server
  - Runs fewer services but some for 100-1M users (hardware dependent)
- Services are persistent



## The Special Services

- MariaDB Service
- Web
  - Web Servers process incoming requests from clients for web resources over HTTP and related protocols
  - Identified by a Uniform Resource Locator (URL)
  - HTTP
  - HTTPS
    - Client is able to authenticate the server
- SSH
  - Remote access protocol for encrypted client-server connection





## Example of another Service

- Microsoft Exchange Accounts
- Internal Email Network using CL
- Web services don't know how to send emails back and forth
- Frontend and backend
  - Frontend
    - Web server sending the graphics to you
  - Backend
    - Machinery of the web server
    - Email server and services move emails across the internet

## Example of another Service Cont.

- TCP/IP provides a reliable, flexible email system built on a few basic protocols
- Simple Mail Transfer Protocol (SMTP) moves mail across the Internet and across your local network
- How Email Works:
  - A mail client sends the message to your mail server (which is owned by the website listed after the @ symbol)
  - Sent by a “mail transfer agent” to a mail exchanger (MX), mail delivery agent (MDA), and finally to the recipient’s inbox

## Sneaky Services

- Network scans can expose ports that are open and closed
- Open ports show which services may be running
  - Nmap
- Logs
  - Security logs, system logs

```
root@wks01:/home/vivek# nmap --top-ports 10 192.168.1.1
Starting Nmap 5.00 ( http://nmap.org ) at 2012-11-27 03:30 IST
Interesting ports on 192.168.1.1:
PORT      STATE SERVICE
21/tcp    closed ftp
22/tcp    open  ssh
23/tcp    closed telnet
25/tcp    closed smtp
80/tcp    open  http
110/tcp   closed pop3
139/tcp   closed netbios-ssn
443/tcp   closed https
445/tcp   closed microsoft-ds
3389/tcp  closed ms-term-serv
MAC Address: BC:AE:C5:C3:16:93 (Unknown)

Nmap done: 1 IP address (1 host up) scanned in 1.58 seconds
```

```
MAC Address: BC:AE:C5:C3:16:93 (Unknown)
```

```
3389/tcp closed ms-term-serv
```

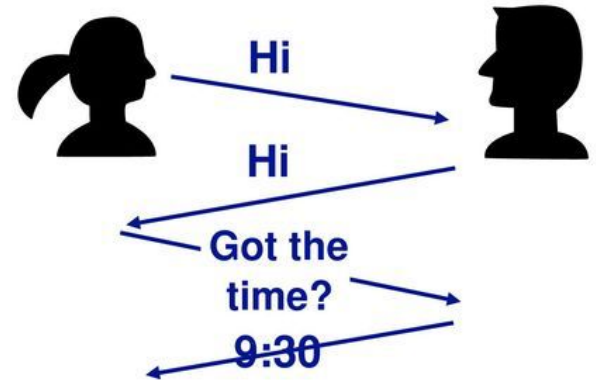
```
443/tcp closed https
```

# Protocols Refresher

- No computers allowed, give protocol examples

## Protocols Refresher

- No computers allowed, give protocol examples
  - Call the Police:
    - “Where is the emergency” > Give location
  - COVID contact tracing:
    - “Who have you been in contact with” > List names



## Protocols Refresher Cont.

- TCP
  - How information should be packaged, sent, and received, and how to get to its destination
- Routing

## MariaDB?

- Database Server
- Supported fork of MySQL
- ~ 935 Companies use MariaDB
  - Samsung
  - Walmart
  -
- Relational Database Management System

# HANDS ON

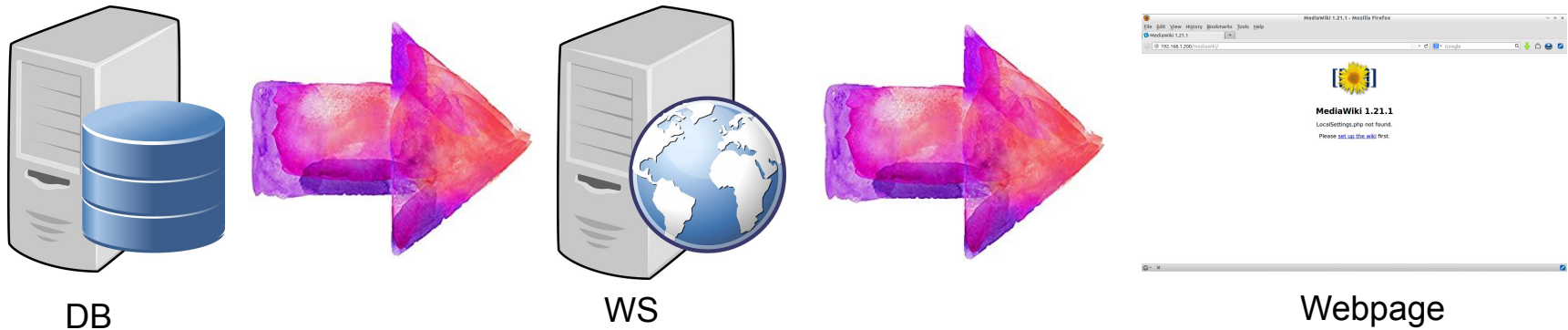
- Database Setup...
  - Netstat port listeners
  - Start the service
  - Enable service for automatic start
  - Verify that it is running and enabled
  - Installing mysql\_secure\_installation
  - Allow traffic across relevant port





# The Roles of a Wiki

- Needs a web server
- Needs a database
  - Schemas, tables, columns, rows
  - Engineered different than an OS filesystem



# HANDS ON

## Web Server Setup...

- Investigation of Apache Config
- Install and set up MediaWiki
- Make MediaWiki accessible from web root



## Localhost & 127.0.0.1

- Localhost
  - If the machine points to itself, it will use localhost to find a service
  - Localhost IP address?
    - Ranges from 127.0.0.0 to 127.255.255.255
    - Usually: 127.0.0.1
  - Generally used for local testing

## Localhost & 127.0.0.1

- Localhost can't be used since we have separate machines (DB and web server)
- Want each machine to rely on each other instead of itself
  - Software configurations in MariaDB and Mediawiki front end

## Localhost & 127.0.0.1 Cont.

- Fun Fact:
  - First section of the address (127) is reserved only for loopbacks
  - Transmission Control Protocol and Internet Protocol (TCP/IP) recognize that you want to contact your computer after entering any address that starts with these numbers
- Uses
  - Program or Web Application Test
    - Loopback to test if applications work
  - Site Blocking
    - Stores Files of Every Site Visited
  - Speed Tests
    - Ping Requests

