

Server Side 1

Servers

What is a server OS?

- A lot of the times, a stripped down version of a standard OS.
 - What does this mean?
- Examples
 - Linux (Debian/Ubuntu, RedHat/CentOS)
 - FreeBSD/macOS Server/NetBSD/OpenBSD
 - Windows Server 20**

What can it serve?

- SSH
- HTTP/S
- FTP/SFTP
- many more ...

Server networking?

- Internet
 - Amazon AWS
 - Digital Ocean
 - Linode
- Intranets
 - Virtual Private Network (VPN)
 - Allows connection to a private network from an outside network.
- Desktop
 - OS
 - Virtual Box
 - Vagrant
 - Containers (Docker)

Hardware vs. Virtualization

- Hardware

- Install server software directly on hardware.
- Advantages?
- Disadvantages?
- Virtualization
 - Software that virtualizes hardware.
 - Guest/Host relationship.
 - Simply, run an OS inside another.
 - Why?
 - Snapshots.
 - Flexible
 - Uses
 - Servers
 - Development
 - Testing
 - Game emulation
- How can you tell?
- Software
 - Virtual Box (Demo)
 - VMWare
 - Parallels
 - Windows Virtual PC
 - KVM

Services

Secure Shell (SSH)

- Network protocol (Part of the Internet protocol suite).
- Bidirectional text-oriented communication.
- Designed to replace Telnet because of encryption.
- Exposes remote OS's command line interface (CLI).
- Best know for remote login to a computer.
- Involves a SSH client and SSH server.
- SSH Clients
 - Linux/Mac (Built into OS).
 - Windows (Putty)
- SSH server
 - SSHD
 - DO NOT TOUCH THIS!
- NOT remote desktop.

- What is this?
- Default port: 22.

Hypertext Transfer Protocol (HTTP)

- Network protocol for communication on WWW.
 - How we send information from a web client to a web server.
- Like SSH, involves a client and a server.
 - What is the difference?
- What is the client and server?
- Request methods.
 - GET
 - Representation of a specified resource.
 - Should ONLY retrieve data and no other effect.
 - URL parameters (query strings) can be used to pass data to server to 'filter' retrieval of data.
 - http://example.com/users?page=5&sort=last_name
 - POST
 - Requests the server to accept a block of data from the user.
 - Data is submitted to a data handling process or create a new resource.
 - PUT
 - Representation of a specified resource.
 - BUT, requests the server to accept a block of data from the user which will be stored under the supplied URI.
 - If resource exists, it is modified, otherwise, creates a new one (but usually, this is the job for the post).
 - DELETE
 - Delete the method specified by the resource.
 - Full list
 - https://en.wikipedia.org/wiki/Hypertext_Transfer_Protocol#Request_methods
- Default HTTP port: 80
- Default HTTPS port: 443

File Transfer Protocol (FTP)

- Network protocol for the transfer of files.
- Like SSH and HTTP, involves a client and a server.
- Authenticated or anonymous users.
- NOT SECURE!
- Clients
 - FileZilla
- FTP over SSH

- Encrypts both commands and data.
- We'll see an example on Linux.
- Cyberduck (Windows)
- Default port 21

Web Server

- Implements HTTP!
- Static vs. Dynamic.
- Static
 - HTML pages (i.e. .html).
 - Images.
 - Videos.
- Dynamic
 - Sends request to server applications.
- Examples
 - Apache
 - Nginx
 - IIS
 - Apache Tomcat
 - https://en.wikipedia.org/wiki/Comparison_of_web_server_software
- Built-in
 - Django
 - NodeJS
 - PHP
- Configurations
 - Content types.
 - Content sizes (IN).
 - Error pages.
 - Proxy / Caching proxy
 - Pass on traffic!
 - Load balancing
 - Distribute traffic to multiple application servers (or web servers).
 - Rule based.

References

- CLI Cheat Sheet: <https://www.cheatography.com/davechild/cheat-sheets/linux-command-line/>
- APT-GET: <https://help.ubuntu.com/community/AptGet/Howto>

FINAL DO and DO NOTs.

- DO NOT shut-down your Virtual Machine.
- DO NOT touch SSHD service or software or configuration.
- DO BE VERY CAREFUL with super user (sudo) command.
- DO USE sudo ONLY when you need root privileges; you can DO most of your work on the server as regular user