

Cyber Defense Organization

Fall 2018 - Routers & Security

Spooky edition



DNS is down

Why is my password not working?

Where are my backups??

Hard drives going *tick tick*

Quick Update!



Exploitation Training!

"Exploitation and reverse engineering are arts. They are puzzles.
The ultimate video game. Thrilling. Agonizing. They are arts.
Come revel in the art with us."

<https://www.exploitation.training/>

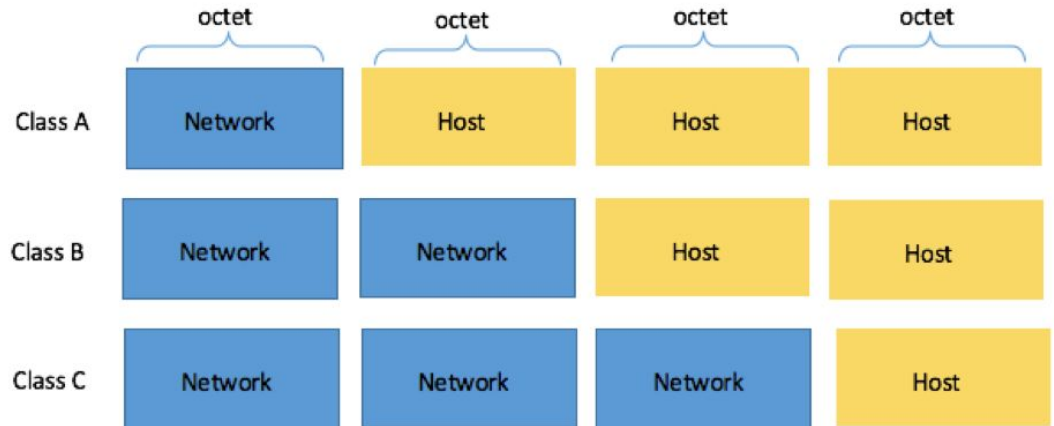


Word of the Week!

Subnetting

Subnetting

- Process of dividing networks into multiple parts
- Utilize binary versions of IP address and subnet masks
- Basic process:



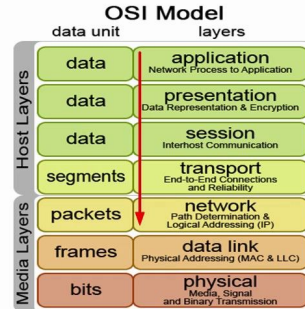
What are Routers?

- Layer 3 - Network
- Edge of your network
- Provide the ever important internet connection to the LAN

Layer 3 – Network Layer



- The “Routing” Layer
- Provides addressing and routing services
- Places two addresses in the packet:
 - Source Address & Destination Address
- Internet Protocol (IP)
- The primary network protocol used on the Internet, IPv4, IPv6 Logical Addresses



The Function of a Router

- Allow access to the WAN for LAN devices
- How?
 - Layer 3
 - IP Address
 - Subnet mask



Routing Tables

- Logic tables that contain all the known routes in a router
- Filled via two methods:
 - Static routing
 - Dynamic routing

```
C:\>route print -4

=====
Interface List
11...bc 30 5b a6 b2 6d .....Broadcom NetXtreme 57xx Gigabit Controller
1.....Software Loopback Interface 1
12...00 00 00 00 00 00 e0 Microsoft ISA/IAIP Adapter
14...00 00 00 00 00 00 e0 Teredo Tunneling Pseudo-Interface
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          10.1.0.1          10.1.0.177       11
10.1.0.0                    255.255.0.0      On-link          10.1.0.177       266
10.1.0.177                  255.255.255.255 On-link          10.1.0.177       266
10.1.255.255                255.255.255.255 On-link          10.1.0.177       266
65.52.107.0                 255.0.0.0        10.1.0.1          10.1.0.177       11
65.52.107.0                 255.255.255.0    10.1.187.236      10.1.0.177       11
127.0.0.0                   255.0.0.0        On-link          127.0.0.1        306
127.0.0.1                   255.255.255.255 On-link          127.0.0.1        306
127.255.255.255             255.255.255.255 On-link          127.0.0.1        306
224.0.0.0                   240.0.0.0        On-link          127.0.0.1        306
224.0.0.0                   240.0.0.0        On-link          10.1.0.177       266
255.255.255.255             255.255.255.255 On-link          127.0.0.1        306
255.255.255.255             255.255.255.255 On-link          10.1.0.177       266
=====

Persistent Routes:
None

C:\>
```




Static vs. Dynamic



Static:

- Manually tell the router where other networks are
- Complex with large networks, Easy with small

Dynamic:

- Routers automatically fill the table based on what it knows
- RIP, BGP, OSPF
- Complex for small, Easy for large

To Packet Tracer my Friends!



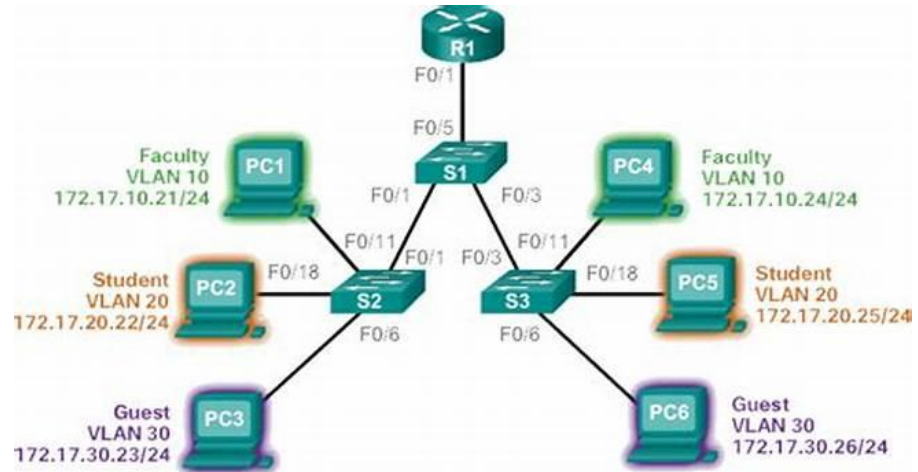
Security on a Router

- Edge of your network
- Utilize layers
- Configure securely
 - Minimum resources required
 - Passwords
 - Encryption



VLANs Application

- Further scope down the security of your network
- Allows separation in the business in case different departments are present
- Myriad of other uses



Access Control lists Application

- Leverage the created VLANS to implement a business/security policy
- Block traffic from certain networks
- Principal's about how to implement them



Cya Next week!

Send your cute pet
picture to Liam!

wcsmith@albany.edu

Follow us on Twitter? Add on
myInvolvement?



CCDC Team! - Monday
7:15pm BB121



Workshop? Yeah probably
- **Friday 3pm BB123**