Internet Protocol - ARP and DNS Fundamentals

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Course Overview

Network Topologies and the OSI Model

Internet Protocol –
Addressing and Subnetting Fundamentals

**Internet Protocol –
ARP and DNS Fundamentals**

Internet Protocol - Routing Packets

Routing Packets with Linux

Investigating TCP Internals

Troubleshooting Network Issues

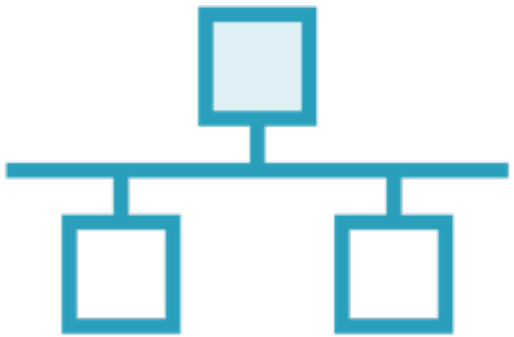
Module Overview

Ethernet

Translating MAC to IP with ARP

Converting names to IPs with DNS

Ethernet



A very commonly used physical network

Layer 2

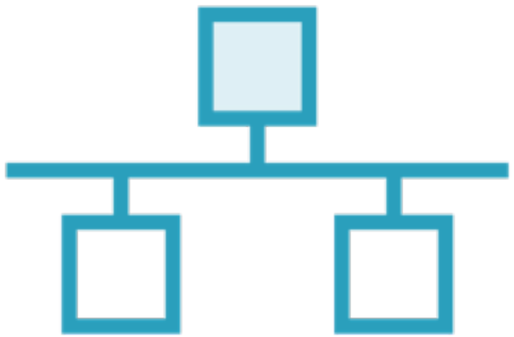
Unique 48 bit address called a MAC Address

Systems are connected together on a bus on a switch

MAC is contained within the Ethernet frame header

Maximum Transmission Unit - 1500 bytes

Ethernet



IP gets the data to the network,
Ethernet gets to the host

How do we get from layer 3 to layer 2?

Address Resolution Protocol (ARP)

http://www.erg.abdn.ac.uk/users/gorry/course/inet-pages/arp.html

Used to map MAC addresses to an IP

Broadcasts on the bus to see who has the MAC for a particular IP

The owner of that IP replies

Cached in the ARP cache

Demo

- **ARP Request with** `wireshark`
  - **Local address and a remote network**
- **ARP Cache using** `arp` **and** `ip`

Domain Naming System (DNS)

Used to map names to IPs

DNS Servers store databases mapping names to IPs

Request an IP for a name

Clients store DNS servers information in `/etc/resolv.conf`

Varying record types

- A Record is a host
- CNAME is an alias

Demo

Examine DNS client configuration

Generate host name requests using `dig` and `host`

Examine a DNS request using `wireshark`

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What's Next!

Internet Protocol – Routing Packets

References

- **Internetworking with TCP/IP Vol. 1** by Douglas Comer - http://amzn.to/29X7dyT