Let’s Build a Network

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April 16, 2015

Who’s this guy?

- Network Engineer
- Systems Engineer
- Security Professional
- All around good guy

Elements of a Network

- Clients
- Servers
- Access to something (Internet? Intranet?)
- Common Language
- Language Interpreters

Let’s break it down

Clients

- End-users
- Many different devices
- Phones, Desktops, Printers, Photo Frames, Game Consoles, Cameras, etc… Yes, even Toasters (http://www.theregister.co.uk/2008/09/11/wacky_toaster/)
- Generally, a mess
- Typically considered a low security domain

Servers

- Services for end-users
- Services for the public
- Higher level of control
- Higher security domain

Connections

- Typically *why* we create a network
- Connect to the Internet?
- Private Intranet
- All of the above!
- Security different for each connection

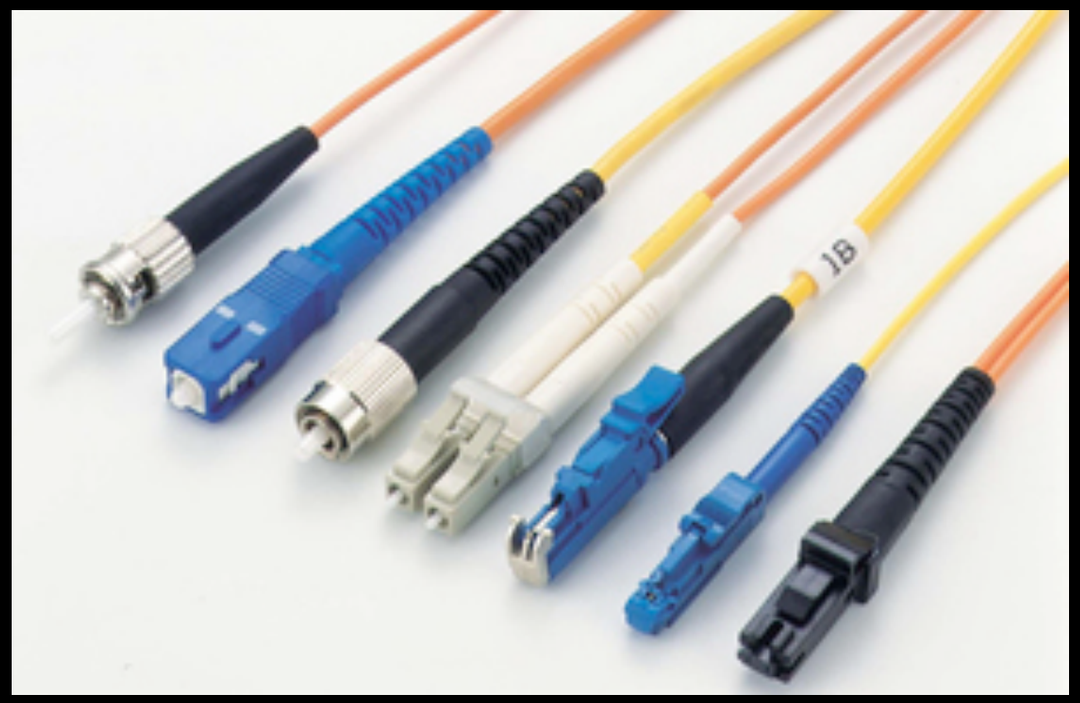
Speaking the Language

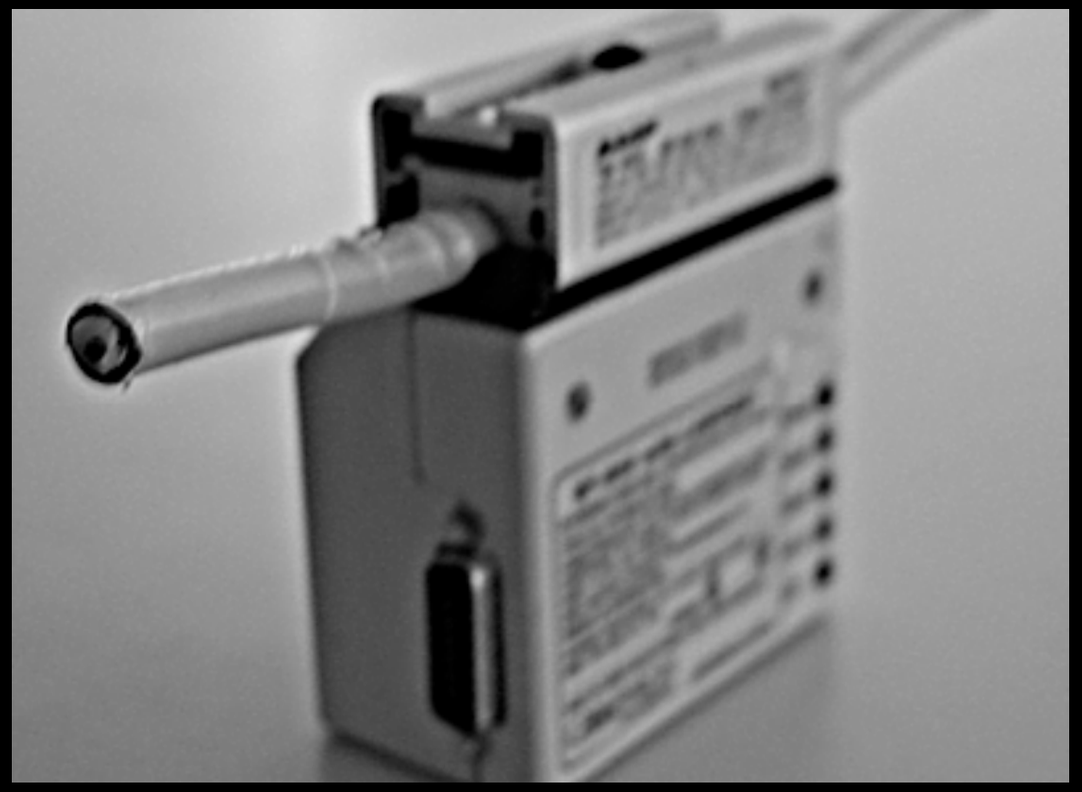
- Different languages per layer
- Some layers have multiple languages
- Requires “interpreters” between devices
- Some languages have advantages over others

Putting it all together

Layer 1 - Physical

- SONET
- DS-1/3
- OC-3/12/48/192
- 10Base2, 10BaseT, 100BaseT, 1000BaseT
- 802.11 Wireless (Technically layer 1 & 2)
- DOCSIS (Technically layer 1 & 2)





Layer 2 - Data Link

- Ethernet (802.3)
- Wireless 802.11 a/b/g/n/ac
- ATM
- DOCSIS
- Frame Relay
- Token Ring

Layer 3 - Network

- IP
- ICMP
- ARP
- Routing (OSPF, RIP, BGP, EIGRP, IS-IS)
- IPSec

Layer 4 - Transport

- TCP
- UDP

Layer 5 - Session

- NetBIOS
- RPC
- Half/Full Duplex
- Simplex

Layer 6 - Presentation

- SSL / TLS
- ASCII
- MIDI
- MPEG

Layer 7 - Application

- DNS
- FTP
- HTTP
- NFS
- DHCP
- SMTP
- SNMP
- Telnet
- And on, and on, and on …

Layer 8 - User

- Politics

TCP/IP Model

- Link (OSI layer 2)
- Internet (OSI Layer 3)
- Transport (OSI Layer 4)
- Application (OSI Layers 5, 6, and 7)