



# Networking 101

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# About Me

- 30+ years experience with IT and computers
- 12 years Air Force aircraft mechanic
- 4 years Air Force Reserve network infrastructure in
- 7 years Hewlett Packard field service and account support
- 6 years Northrop Grumman facilities, hardware engineering, configuration management
- 5th year light show enthusiast
- Facebook:  
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# Networking 101

- Can range from simple to very complex
- Lots of different ways to accomplish the same thing
- Focus on just enough to get a lightshow up and running



# Network Cabling

## Key Terms:

- Cat 5E
- Cat 6



## Ideal cable:

- Cat 5E
- UV/Outdoor rated
- Pure copper
- UTP

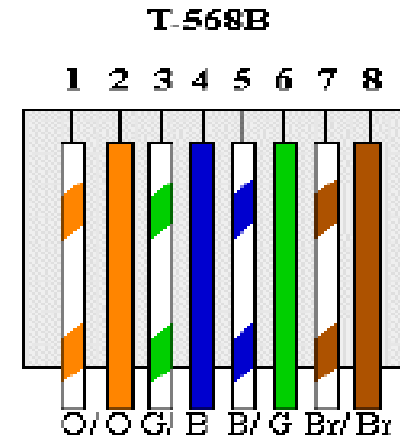
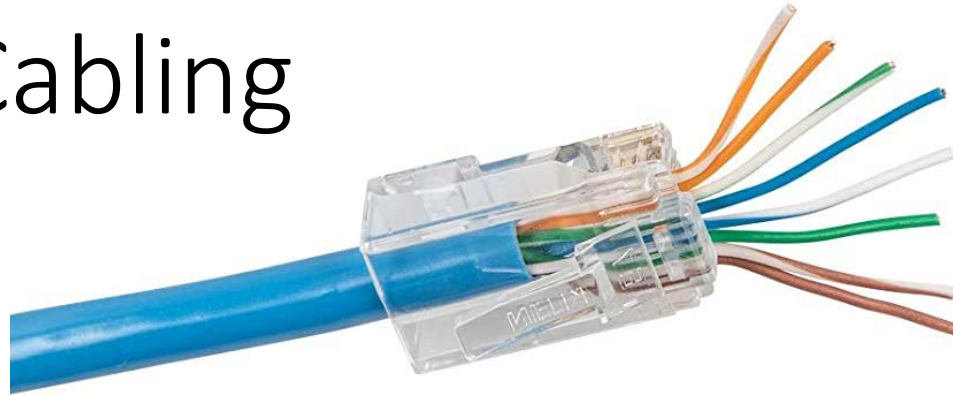
FEATURES / SPECS	CAT 5E	CAT 6	CAT 6E	CAT 6A	CAT 7
<b>Common Usage</b>					
Phone Lines	✓	✓	✓	✗	✗
Home Network	✓	✓	✓	✗	✗
Office Network	✓	✓	✓	✓	✗
Data Center	✗	✗	✓	✓	✓
<b>Potential Bandwidth (per sec)</b>	1000 Megabits	1000 Megabits	1000 Megabits	10,000 Megabits	10,000 Megabits
<b>Time to transfer 1 Terabyte</b>	3 hours	3 hours	3 hours	20 minutes	10 minutes
<b>Data Transmission</b>	1000 BASE-T	1000 BASE-TX	Exceeds 1000BASE-TX	10GBASE-T	Exceeds 10GBASE-T
<b>Connector Type</b>	RJ45 8P8C	RJ45 (for Cat6)	RJ45 (for Cat6)	RJ45 (for Cat6A)	GG45
<b>Frequency Range Minimum</b>	0 - 100 MHz	0 - 250 MHz	0 - 250 MHz	0 - 500 MHz	0 - 600 MHz
<b>Frequency Maximum</b>	350 MHz	500 MHz	550 MHz	600 MHz	750 MHz
<b>Performance Distance</b>	328 Feet	328 Feet	328 Feet	328 Feet	328 Feet
<b>Alt. Distance</b>		10Gb @ 180ft	10Gb @ 180ft		

**OVERKILL**



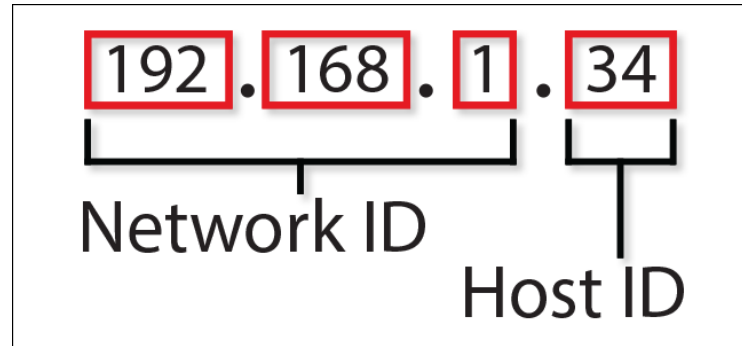
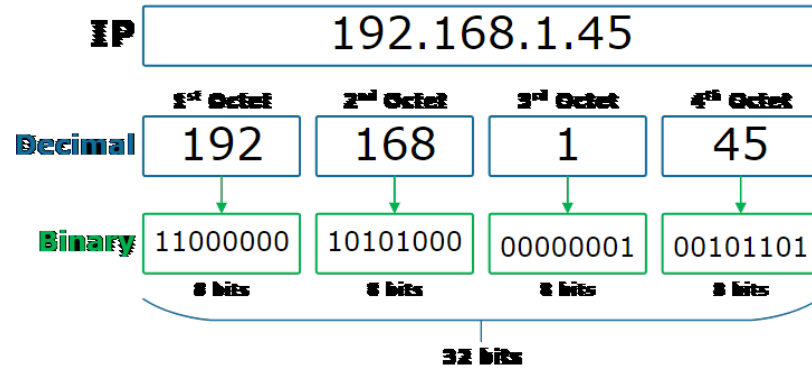
# Network Cabling

Key Terms:  
RJ-45  
Passthrough  
568B  
Service loop  
Crimping tool  
Cable tester



# Basic Network

Key Terms:  
 IP Address  
 Octet  
 Network  
 Host  
 Subnet mask  
 PING  
 IPCONFIG



192.168.1.10



192.168.1.15



**Class A**  
Subnet Mask

Network	Host	Host	Host
255	0	0	0

**Class B**  
Subnet Mask

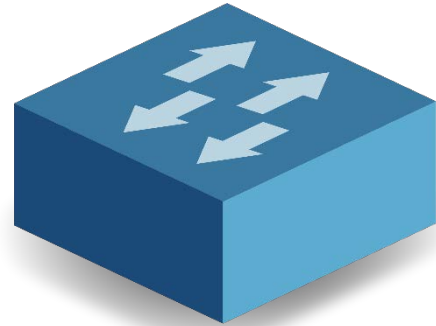
Network	Network	Host	Host
255	255	0	0

**Class C**  
Subnet Mask

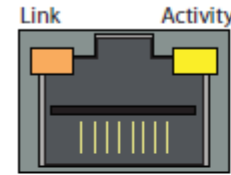
Network	Network	Network	Host
255	255	255	0

# Switched Network

Key Terms:  
Switch  
Mbps  
(Megabits per second)  
Unmanaged



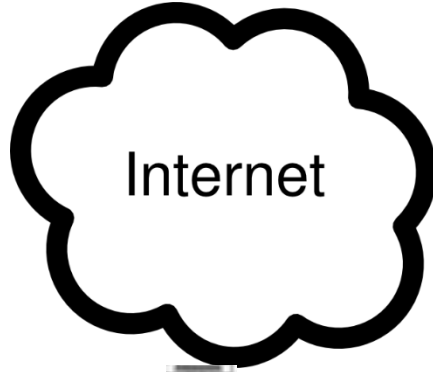
- Switch builds a table of all attached devices
- Sends data from port to port



Label	Color	Port Status
Activity	Steady Yellow	Link is up but inactive
	Blinking Yellow	Link is up and active
	Dark	Link is down
Link	Steady Amber	1000 Mbps
	Steady Green	100 Mbps
	Dark	10 Mbps

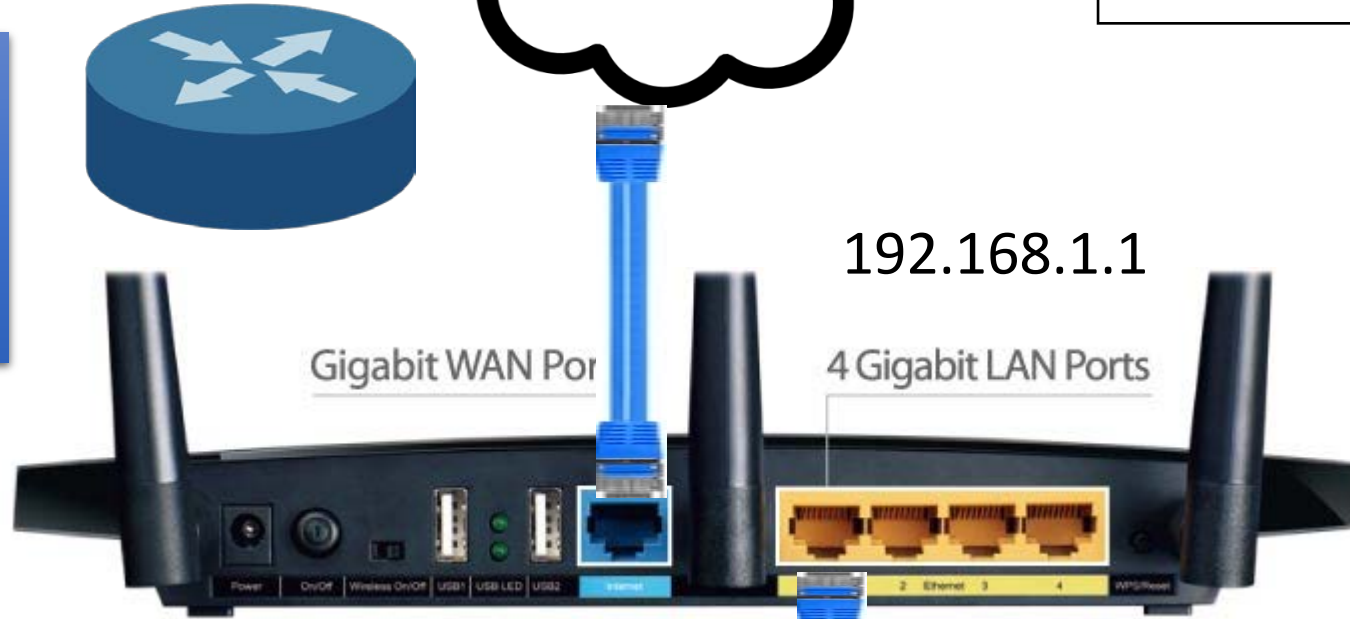


# Routed Network



- Router sends non-local data to the internet

Key Terms:  
Router  
Default Gateway  
DNS



192.168.1.10

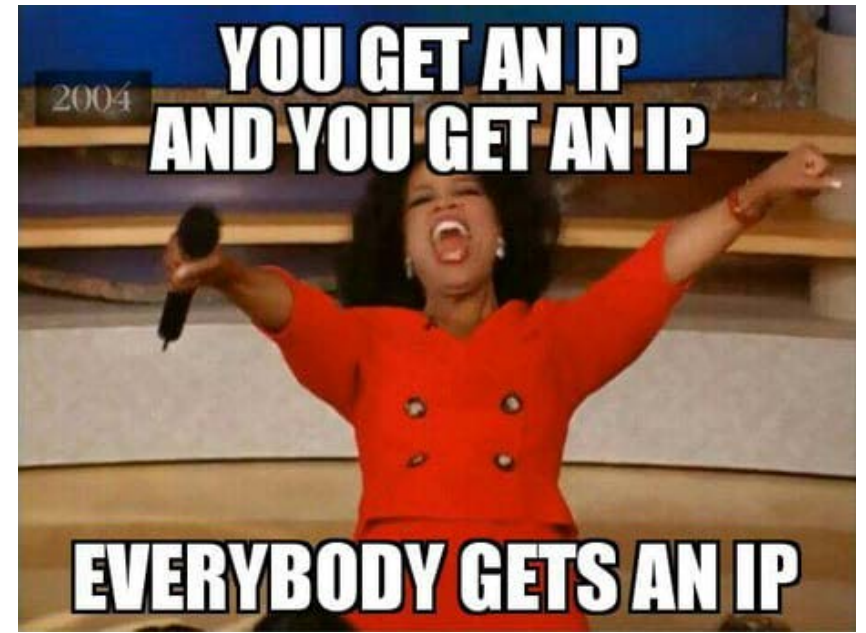
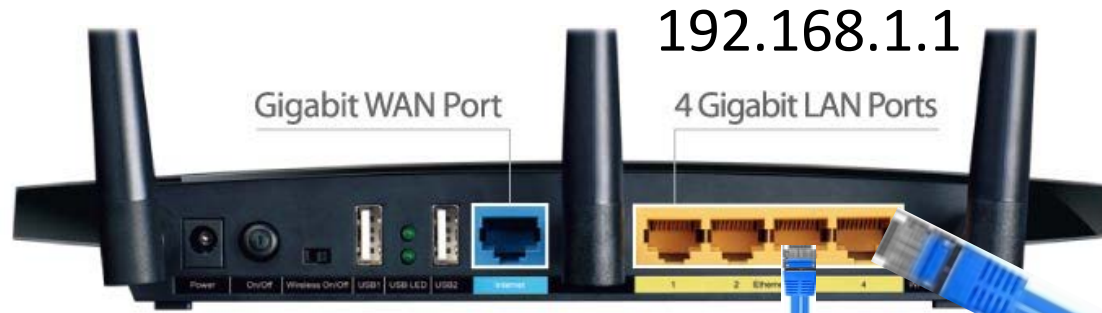


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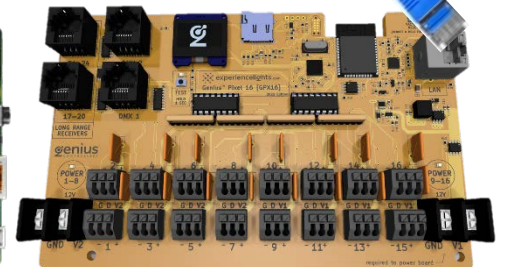
# Show network



Key Terms:  
Static IP  
DHCP  
IP Scanner (xScanner)  
Address Reservation  
MAC Address



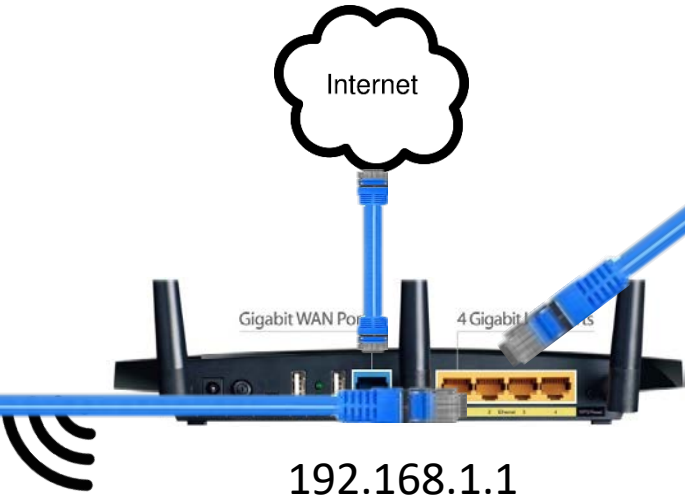
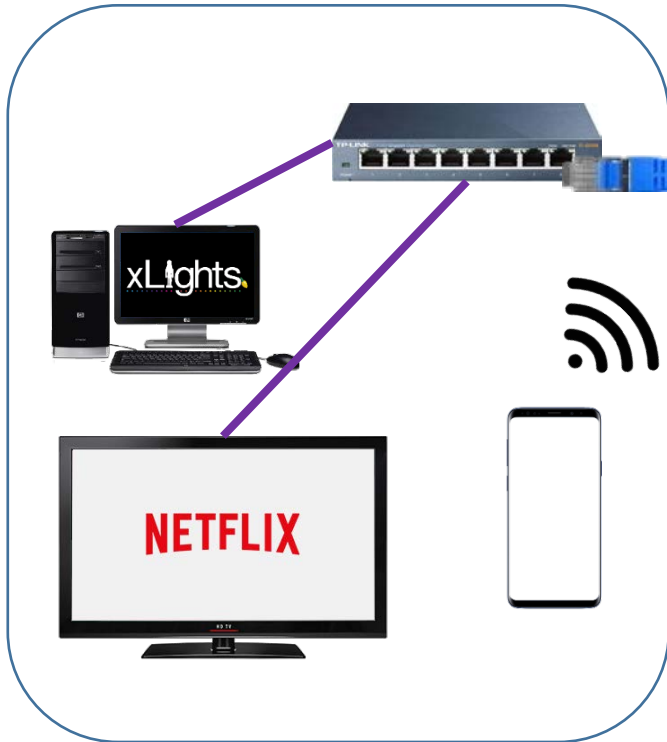
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xSchedule or FPP

# Best Practices

Key Terms:  
Differential  
Receiver



- Switches segregate network
- Flat network
- Black ports are for differential receivers

