LAB 04 Transport Layer

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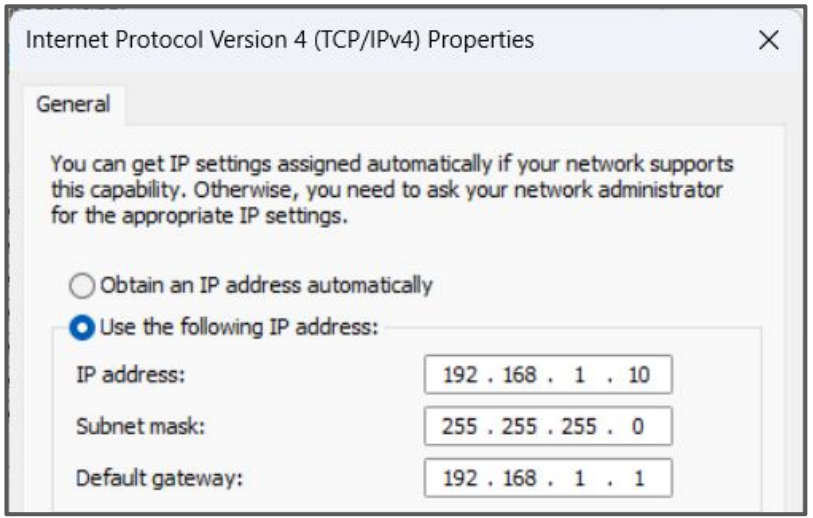
CMPS1192 Networking Fundamentals
October 17, 2024

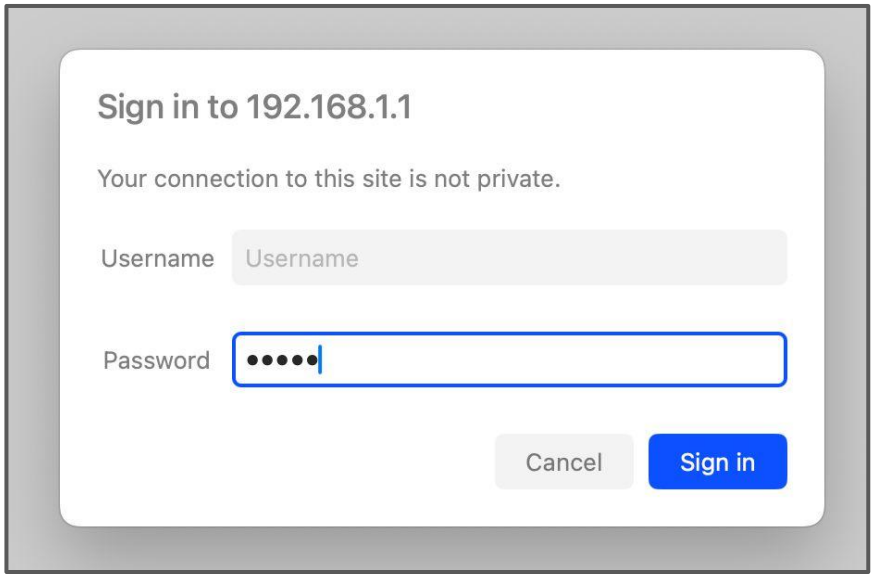
Setting Up the Linksys WRT54GL

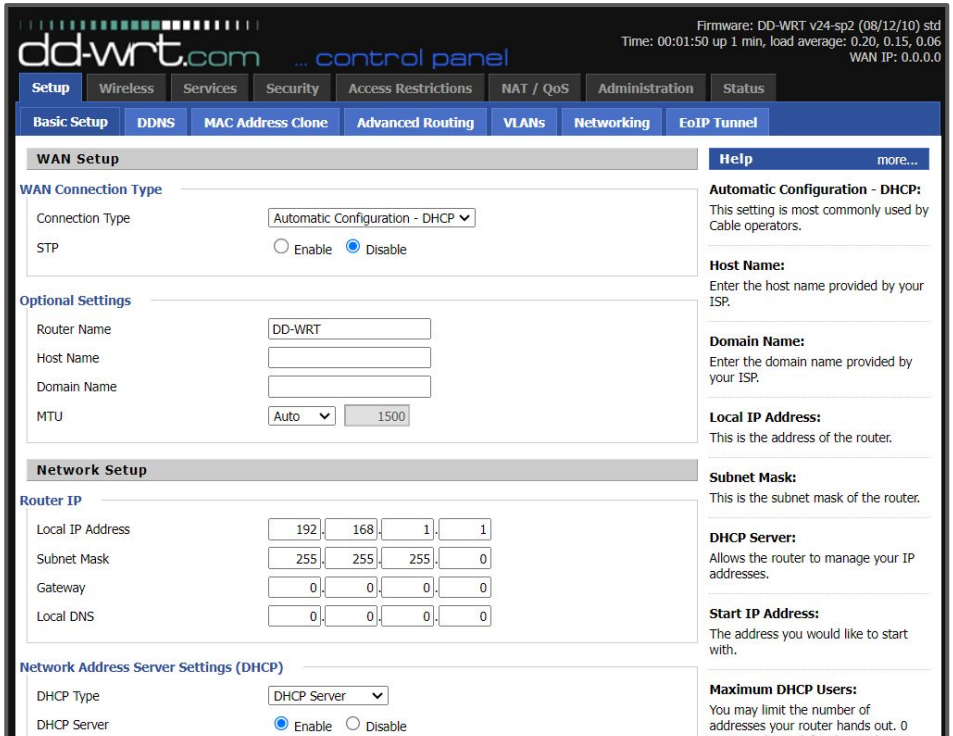
Step 1: Set a Static IP for your device



Setting Up the Linksys WRT54GL

Step 2: Access the Web Interface





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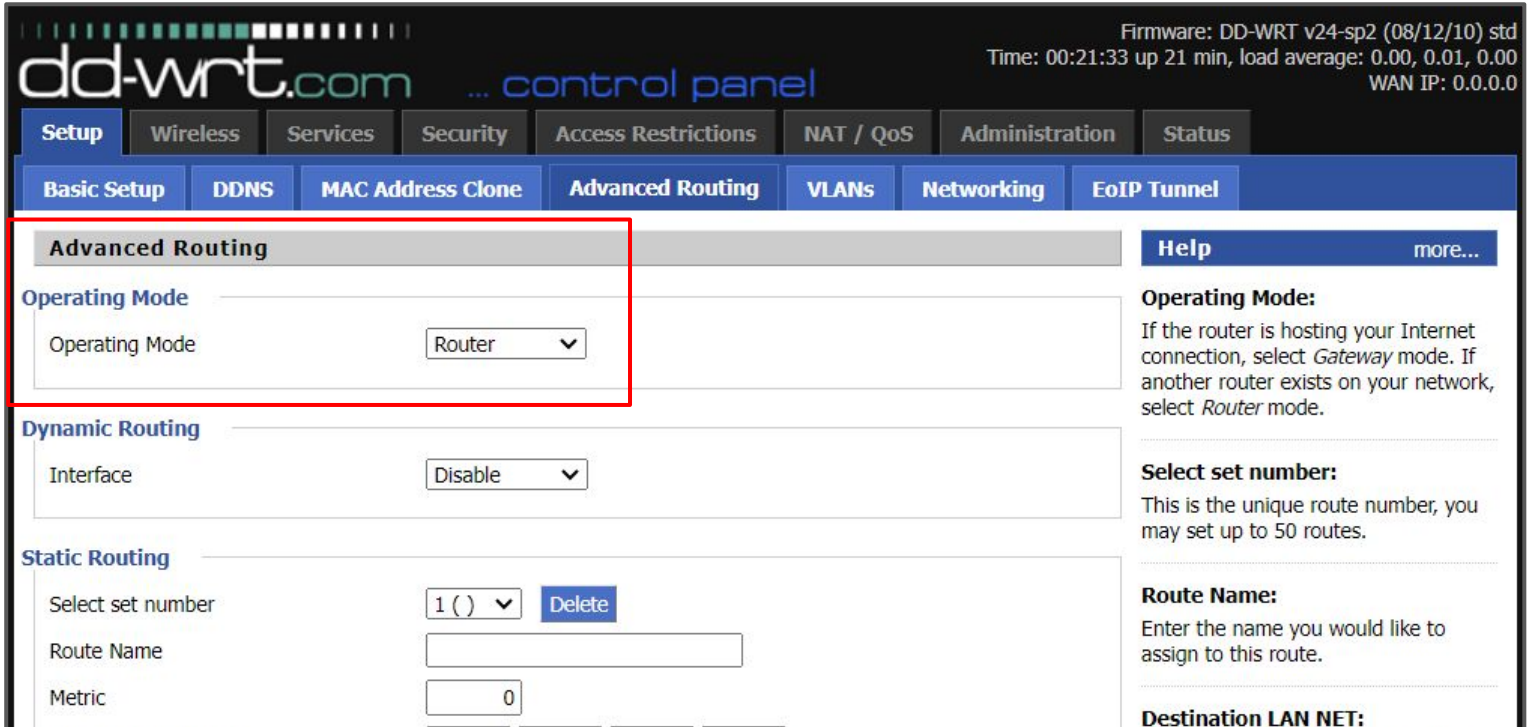
Step 3: Set Operating Mode from Gateway to Router



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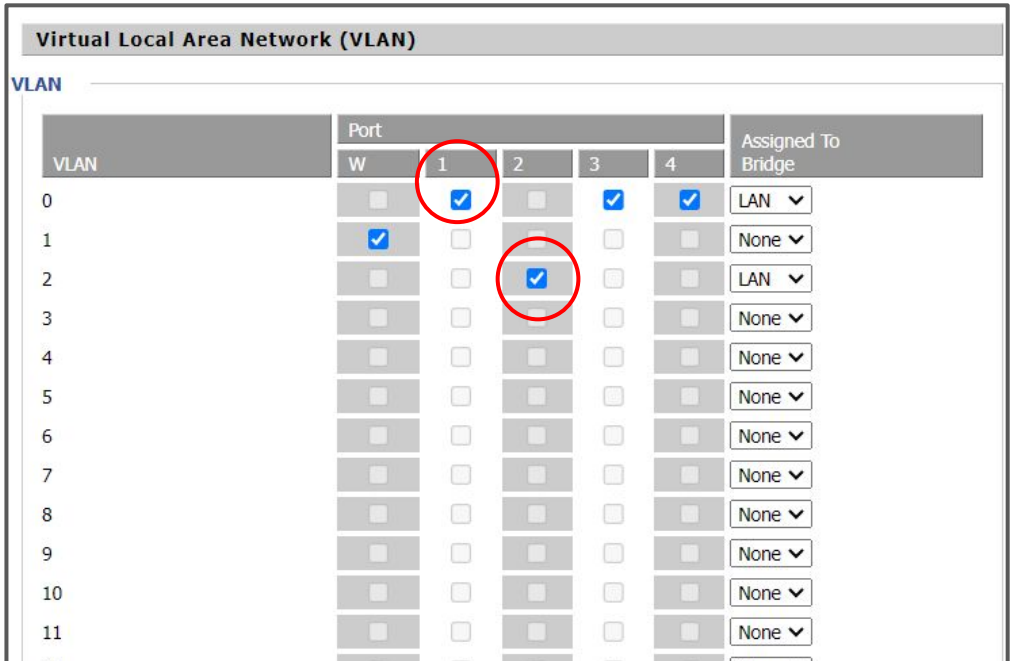
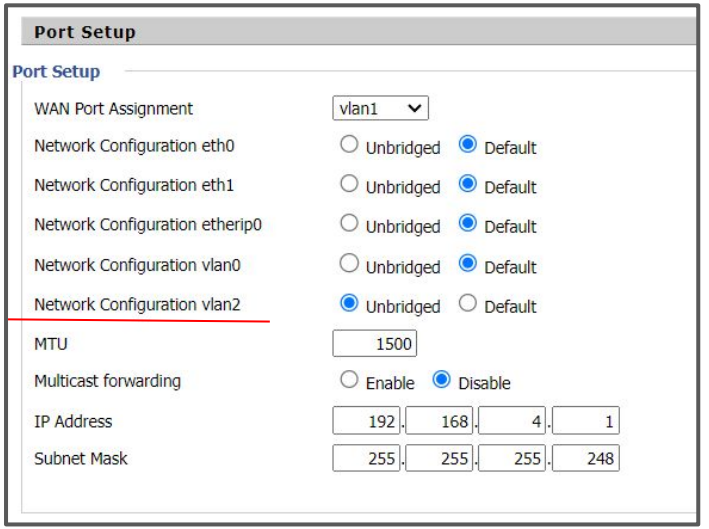
Step 4: Set the VLANs of the Ports

Setup > VLANs



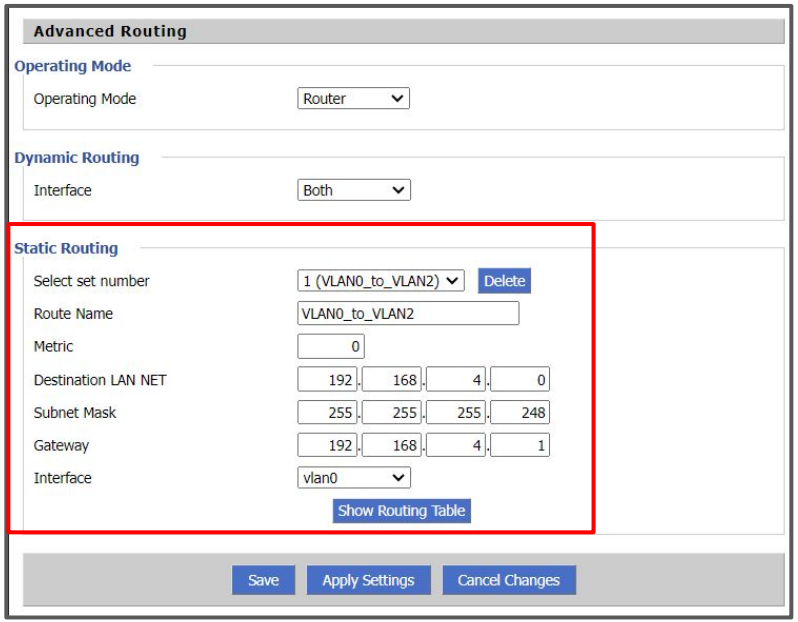
Setup > Networking

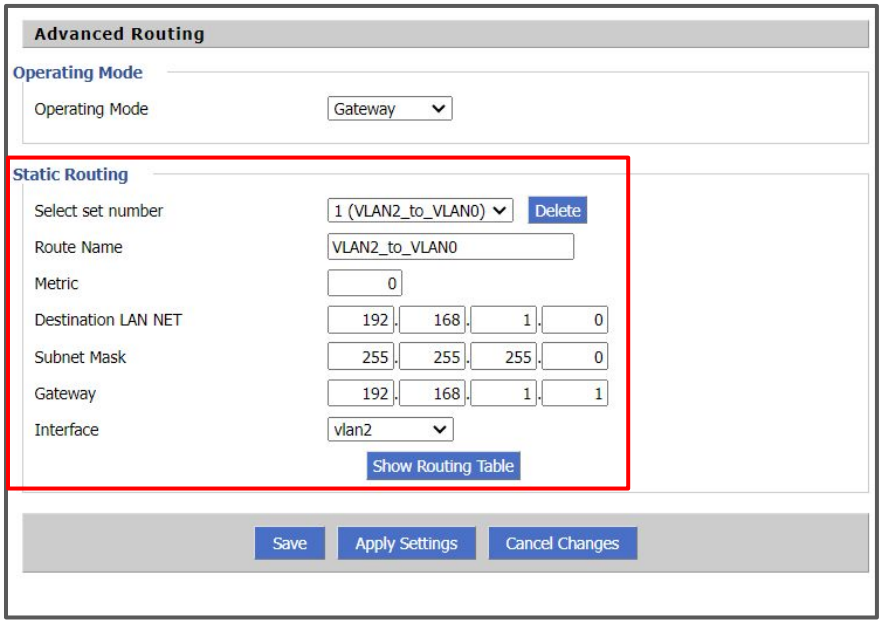


Setting Up the Linksys WRT54GL

Step 5: Set the Static Routes

Setup > Advanced Routing





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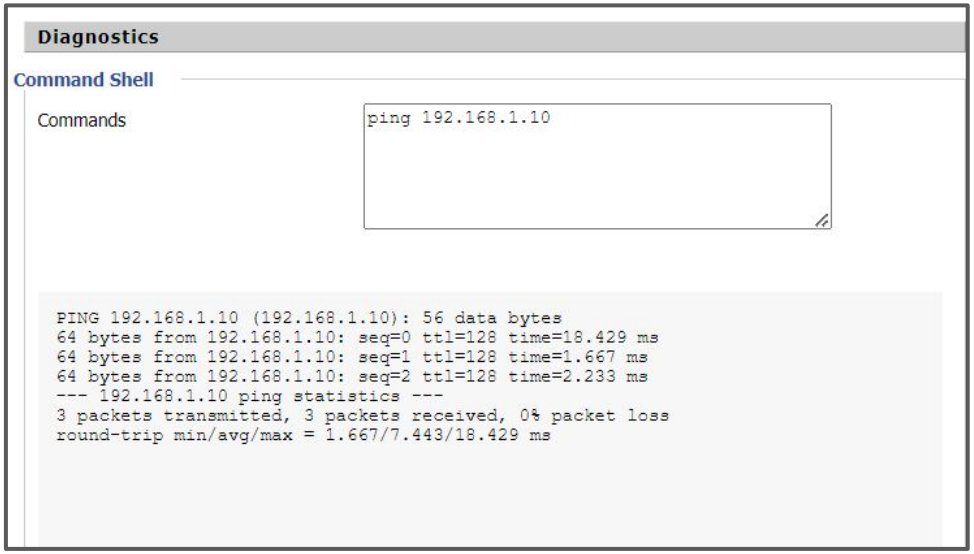
Step 6: Testing

Administration > Commands



Router successfully pinged Host A

HOSTS			
Host A	Jennessa	VLAN0	192.168.1.10
Host B	Andres	VLAN2	192.168.4.2
Host C	Tysha	VLAN2	192.168.4.3

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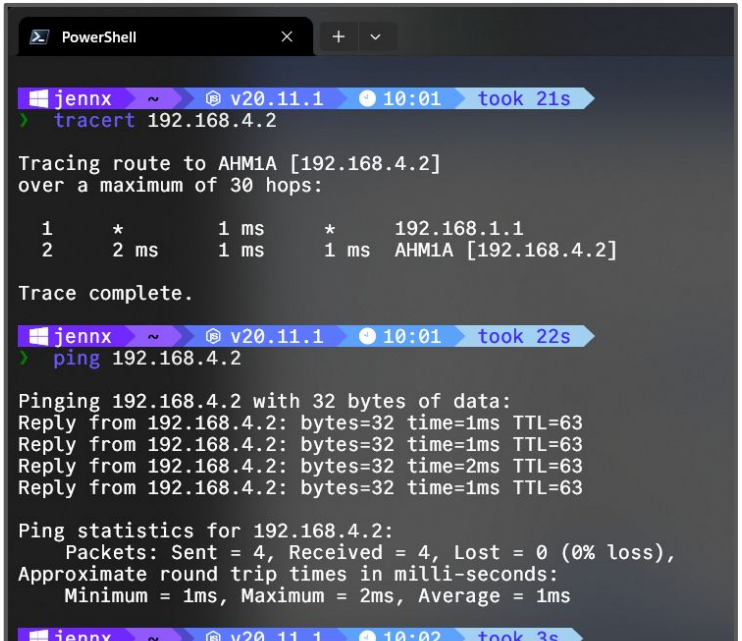
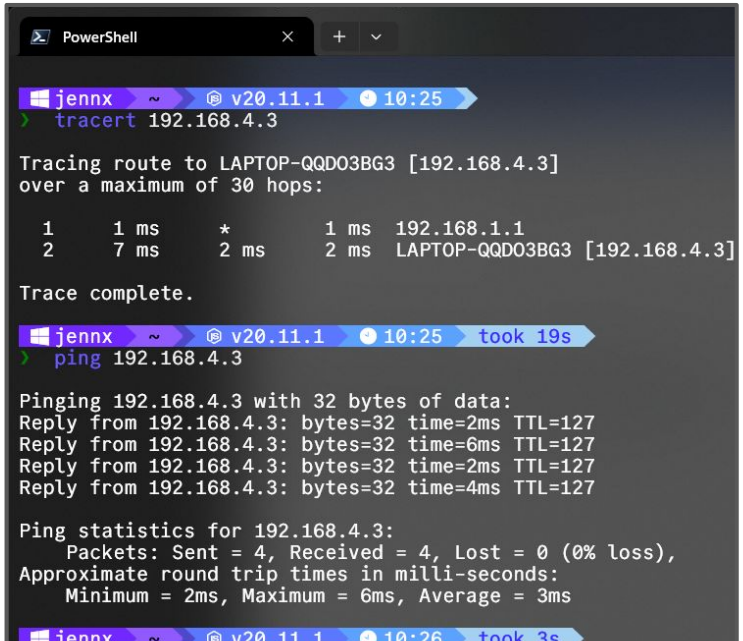
Step 6: Testing (Ping & Traceroute)

Host A ⟶ Host B



Host A ⟶ Host C



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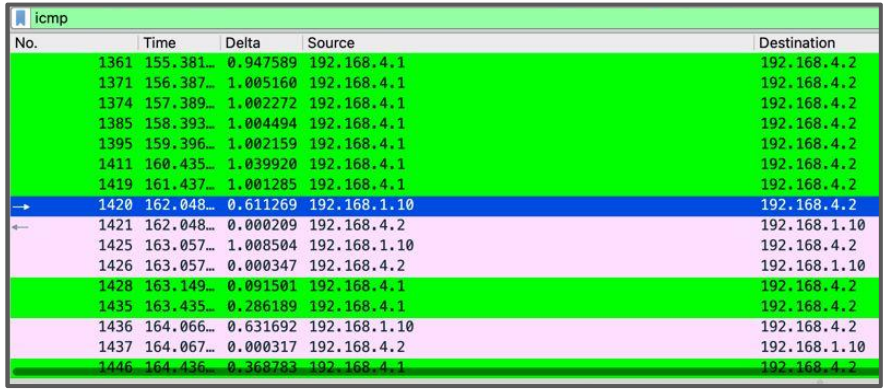
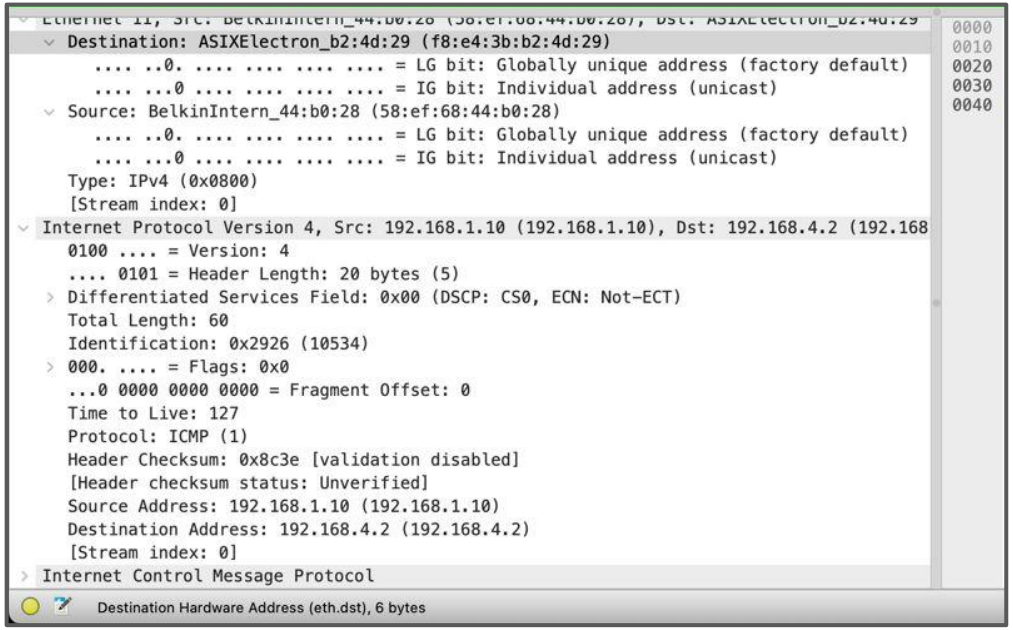
Step 6: Testing (Wireshark)

Network Traffic between Hosts



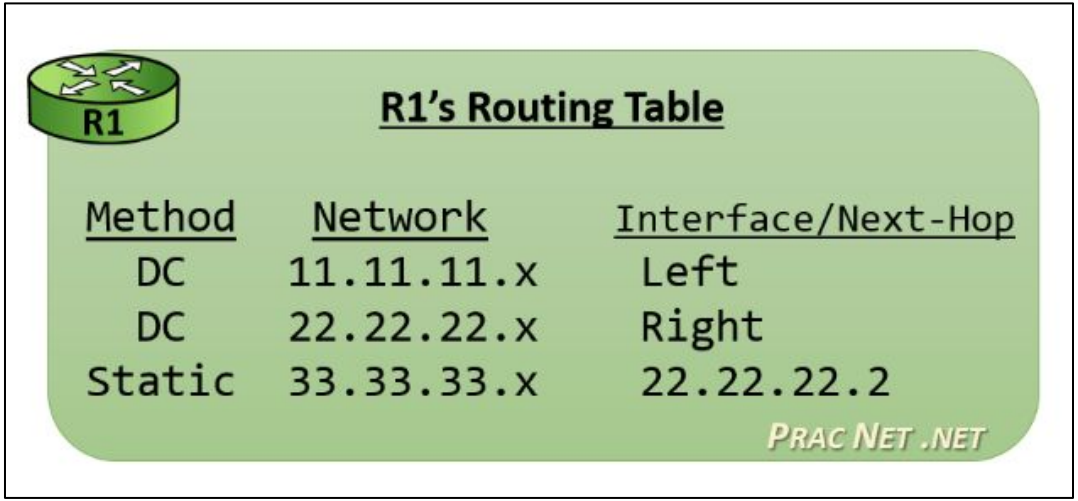


How Routing Works (Layer 3 Review)

- Router maintains a Routing Table, mapping IP Addresses to interfaces.
- Network to network hops

3 Types

- Direct Connection
- Static Routing
- Dynamic Routing

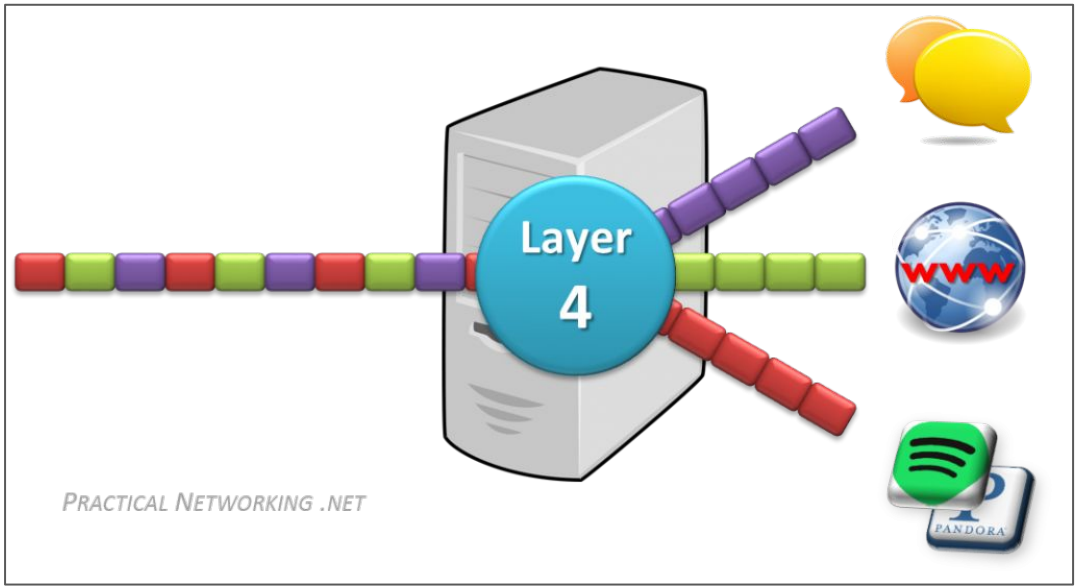


Why the Transport Layer (Layer 4)

- IP is a connectionless protocol.
- Need a guarantee that data is not lost, cannot be duplicated, and assembled in right order.

- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)

- Distinguishes network streams and uses Ports.

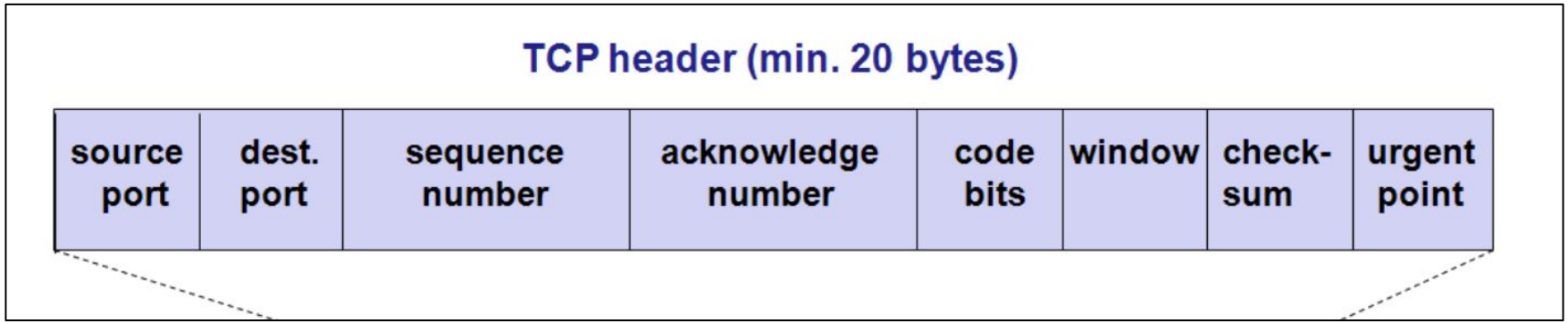


Transmission Control Protocol (TCP)

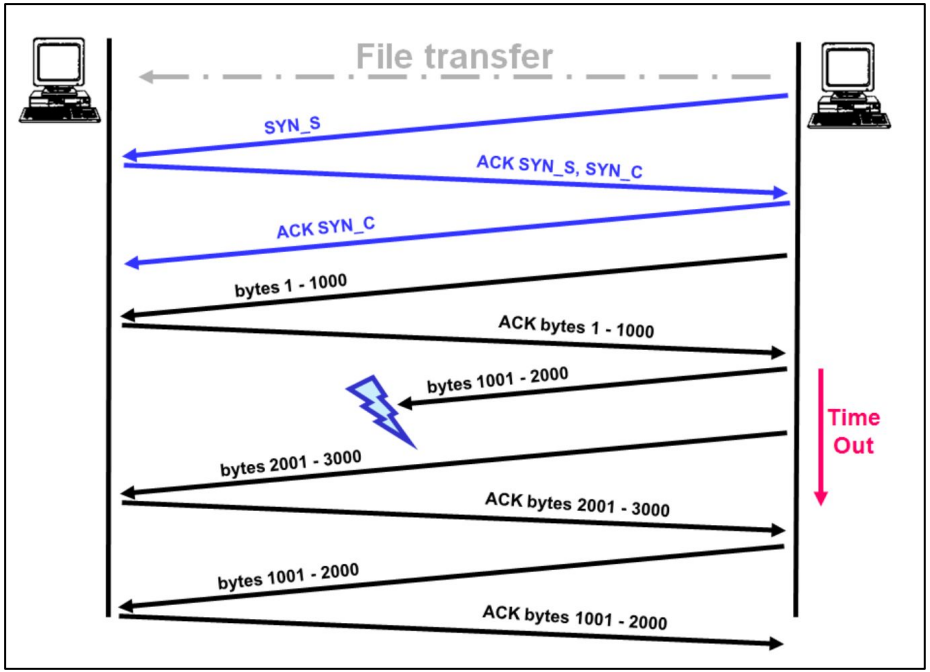
- Connection oriented (logical connection established first and stops when done).
- Reliable protocol (achieved through resending datagrams, window mechanisms, and three-way handshake.)

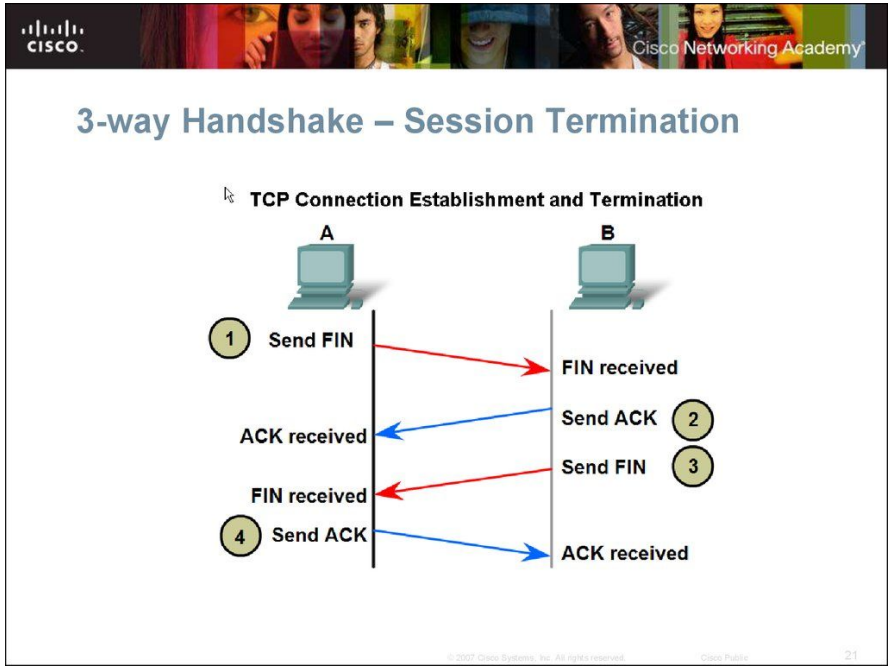
Examples

- HTTP (Port 80)
- HTTPS (Port 443)
- FTP (Ports 20/21)



Three-way Handshake (TCP)



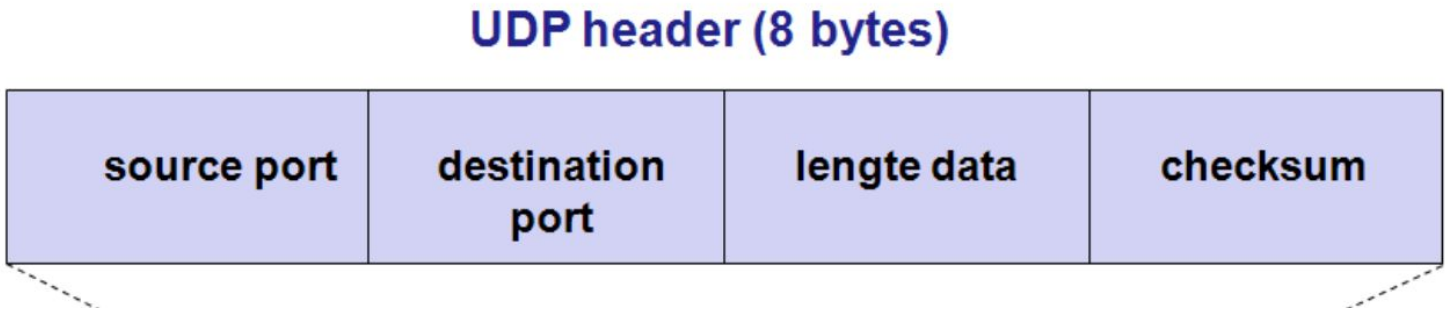


User Datagram Protocol (UDP)

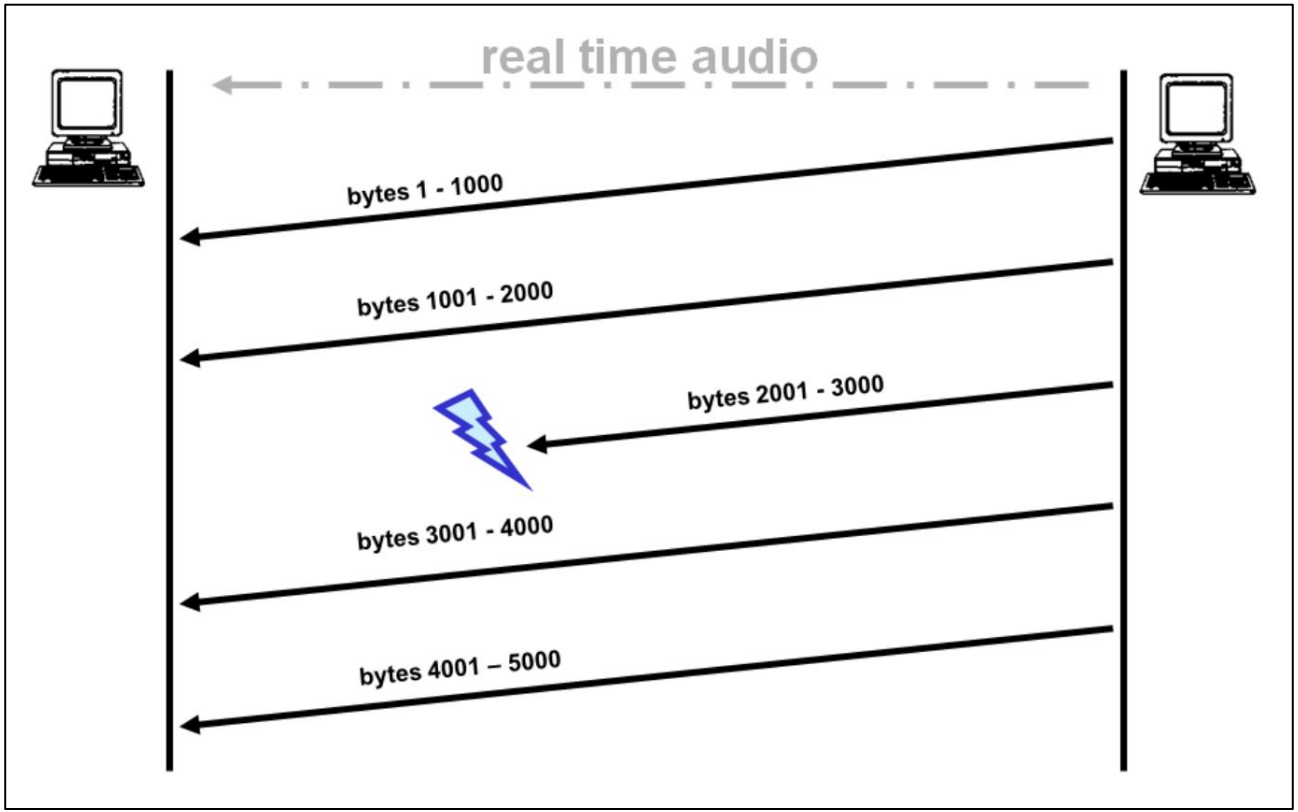
- Connectionless
- Just a simple checksum
- Great where reliability is not important.
- E.g. streaming, videoconferencing, etc.

Examples

- NTP (Port 123)
- DHCP (Ports 67/68)
- TFTP (Ports 69)



UDP Visual


real time audio
bytes 1 - 1000
bytes 1001 - 2000
bytes 2001 - 3000
bytes 3001 - 4000
bytes 4001 – 5000

Layer 4 in action: Client Server Model