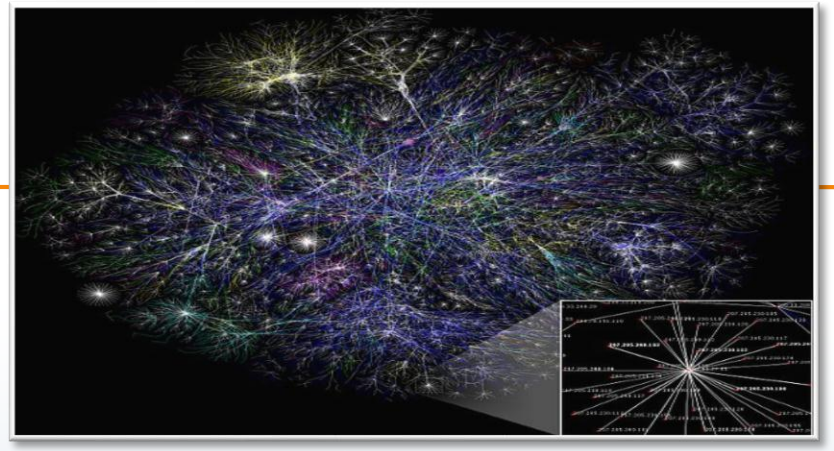
NETWORK TECHNOLOGIES 2



- Firewall
- Voice Over VoIP Phones
- Internet Appliance
- Internet Service Provider (ISP)
  - Cable
  - Digital Subscriber Line (DSL)
  - Dial Up
  - Fiber Optic
  - Satellite
  - ISDN
  - Cellular
  - Wimax

Outline

- Personal Area Network (PAN)
- Local Area Network (LAN)
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- Wide Area Network (WAN)
- Virtual Private Network (VPN)
- Metropolitan Area Network (MAN)
- Campus Area Network (CAN)
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- Enforce MAC Filtering

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Outline

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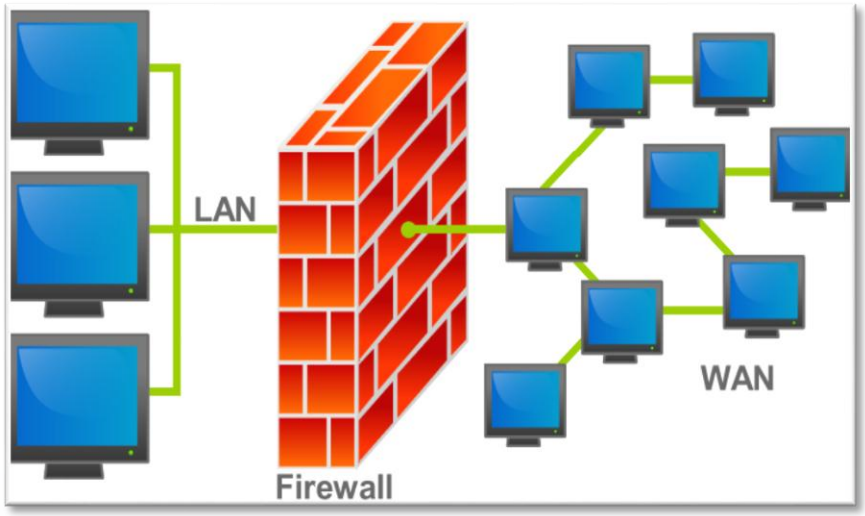
- tracert
- netstat
- net

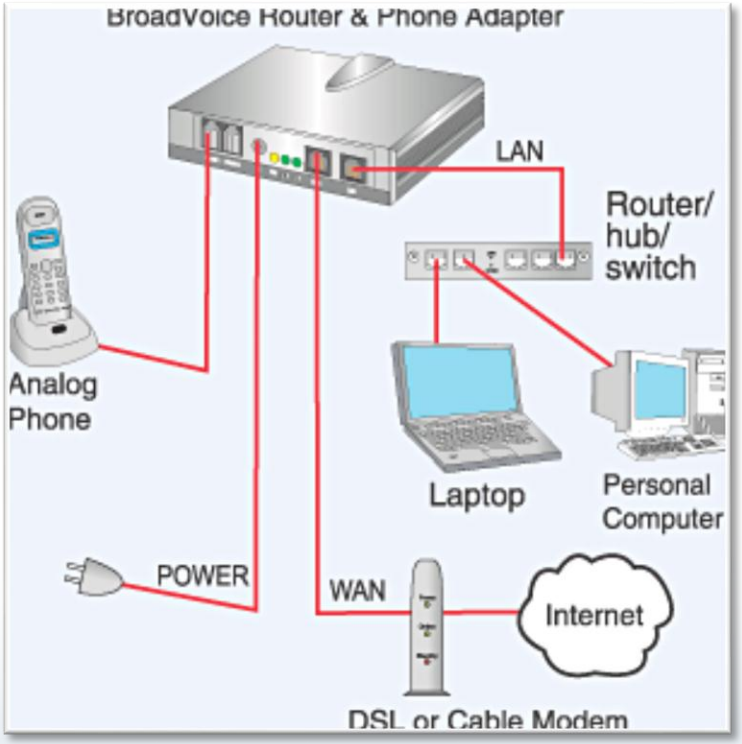
Firewall

- Hardware or software device that enables or blocks incoming and outgoing network traffic based upon a rule sets
- Rules can be based upon ports, source and destination IP addresses, protocols, data type, etc.



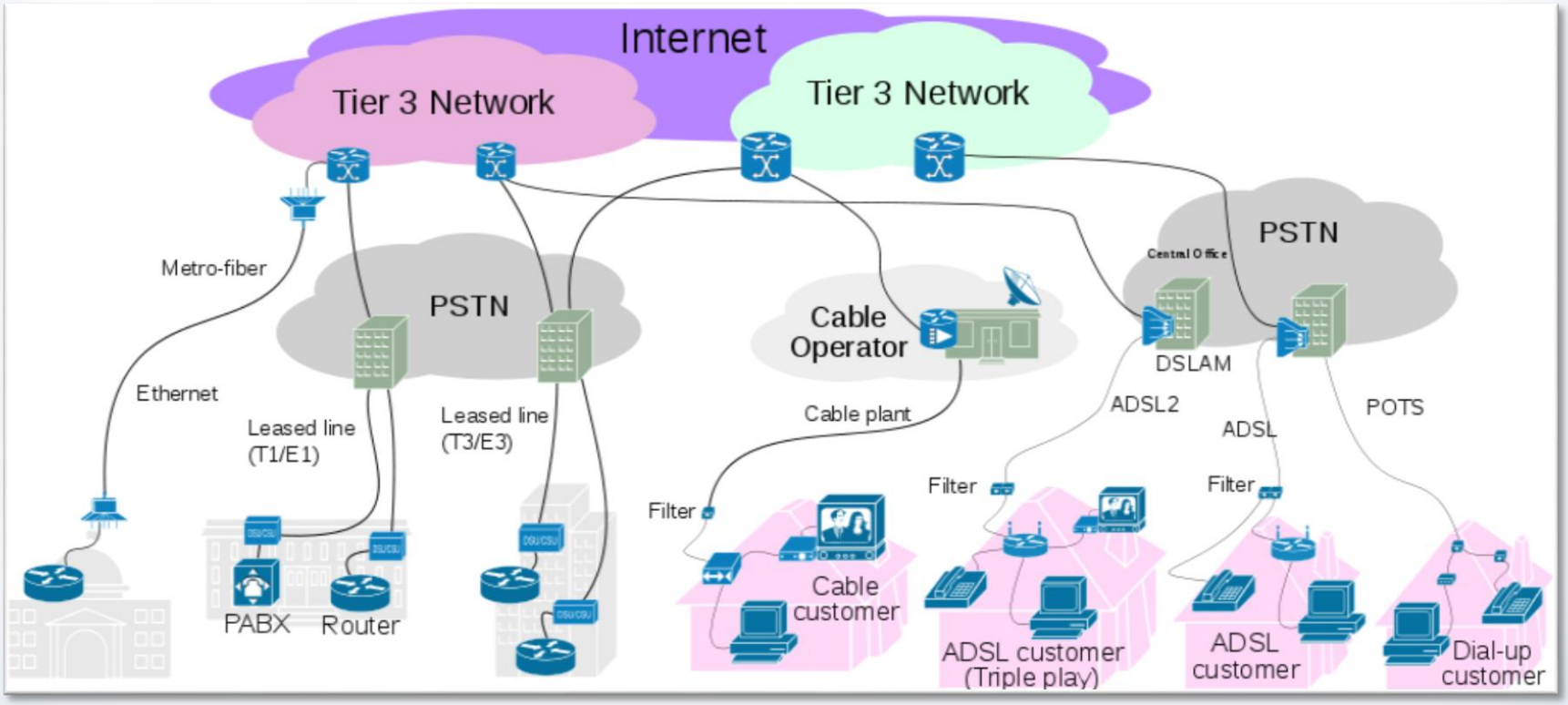
Voice Over IP (VoIP) Phones

- Devices that transmit voice and audio over IP networks with a destination to a POTS telephone
- Stand alone phone, hardware, or software
- Sometimes integrated with routers and modems



- Computer device that allow access to Internet services
- Examples
  - Set top box connect to TV
  - Handheld computer
  - Tablets
  - Smartphones
  - Console game systems

- An organization that provides Internet access to individuals and other organizations

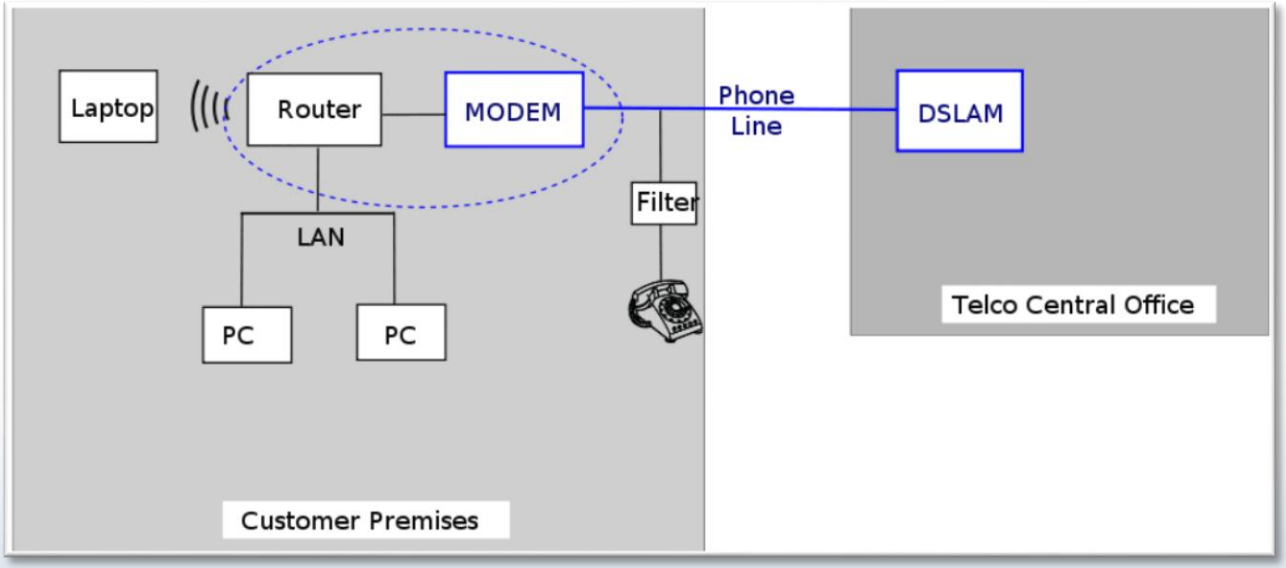


Cable ISP

- Uses cable TV infrastructure to provide Internet access
- Video and data are carried on the same coaxial cable, many time including bundled services
- Speeds vary
  - Download: 3 to 400 Mbit/s
  - Upload: 384 kbit/s to 20 Mbit/s+
- DOCSIS – Data Over Cable Service Interface Specification

Digital Subscriber Line (DSL) ISP

- Transmits digital signals over phone lines
- ADLS – asymmetric DSL – most DLS lines are ADLS because upstream and downstream rates are not equal
- Speeds
- -Download 256 kbit/s to 40 Mbit/s
- -Distance from phone company switching station and phone line quality can significantly affect speed



- Transmits audio signals over PSTN (Public Switched Phone Network) phone line
- Max speed 56 kbit/s
- Low cost
- Limited due to faster ISP

Fiber Optic ISP

- ISP uses fiber optic transmission lines, FiOS
- All the benefits of fiber optic technology including high speed and long data transmission
- Speed
- -Download – up to 2.4 Gbit/s
- -Upload – up to 1.2 Gbit/s

- Uses space satellites to transmit and sometimes receive data over very long ranges (~22,300 miles)
- Can be expensive, requires skill to deploy
- Some systems operate in the download direction and a dialup, or DSL connection must be made for the upload direction
- Used in very rural or remote areas

Integrated Services Digital Network

- Combines voice and data over a PSTN
- Similar but slower than DSL
- Speed 128 kbit/s

- Radio signals from a cellular network to provide data
- Fixed or mobile data, primarily mobile data
- Standards include CDMA, GSM, UTMS, LTE, HSPA+, WiMax, EDGE, HSDPA/HSUPA,
- Range varies: up to 14 km from cell tower
- Speed varies based on standard and network health
  - Downstream: 1.6 – 300 Mbit/s
  - Upstream: 0.5 – 22 Mbit/s

WiMax - Wireless Interoperability for Microwave Access

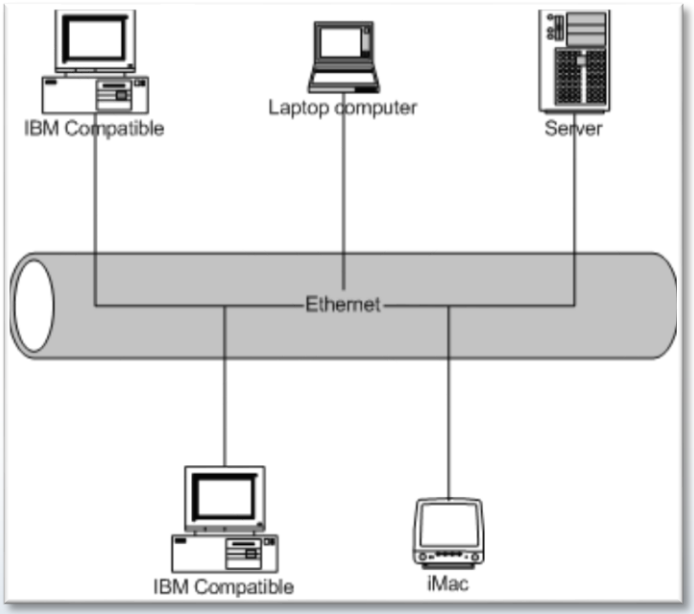
- Packet based wireless radio, 2-11 Ghz range
- Provides fixed and mobile data access
- Range: up to 30 miles for fixed stations, 3-10 miles for mobile devices
- Speed
- - Downstream: up to 141 Mbit/s
- - Upstream: up to 138 Mbit/s
- Line of sight - Distances can be seen by the human eye
- Based on IEEE 802.16 standard

Personal Area Network (PAN)

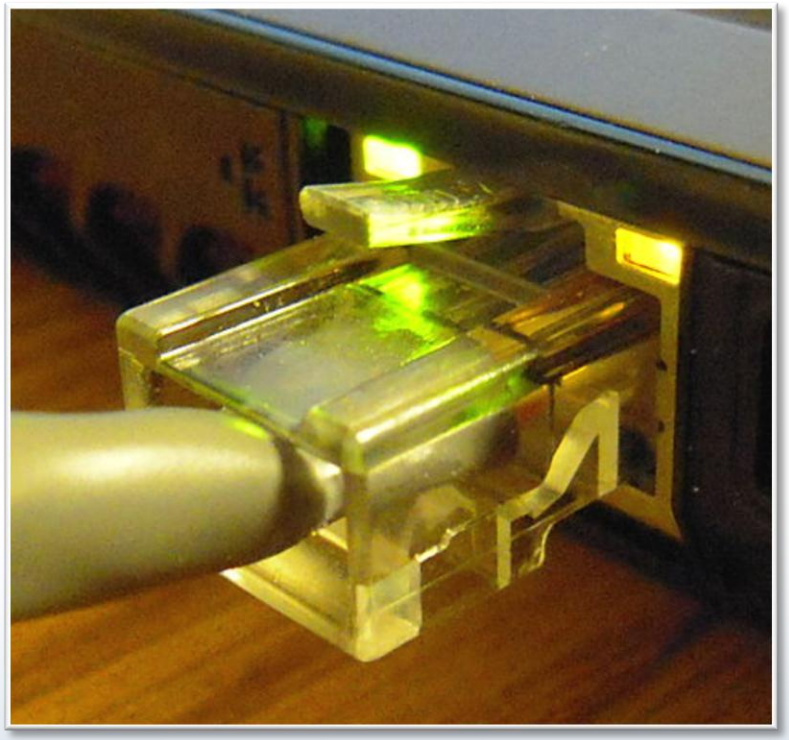
- A collection of 2 or more computing devices connected together to be used by one person
- Implemented over a very short distance such as a desk workspace or small room
- Uses wired or wireless, USB, Firewire, IrDA Bluetooth, Wifi, Z-wave, Zigbee
- IEEE 802.15
- Similar to a Body Area Network (BAN) IEEE 802.15.6

Local Area Network (LAN)

- Self contained network that spans a small area
- Usually high data speeds
- Generally does not require the use of leased data connections
- Vast majority use Ethernet over twisted pair
- Can also use Wifi
- Example: school, home, computer laboratory, office building
- IEEE 802.3, 802.11

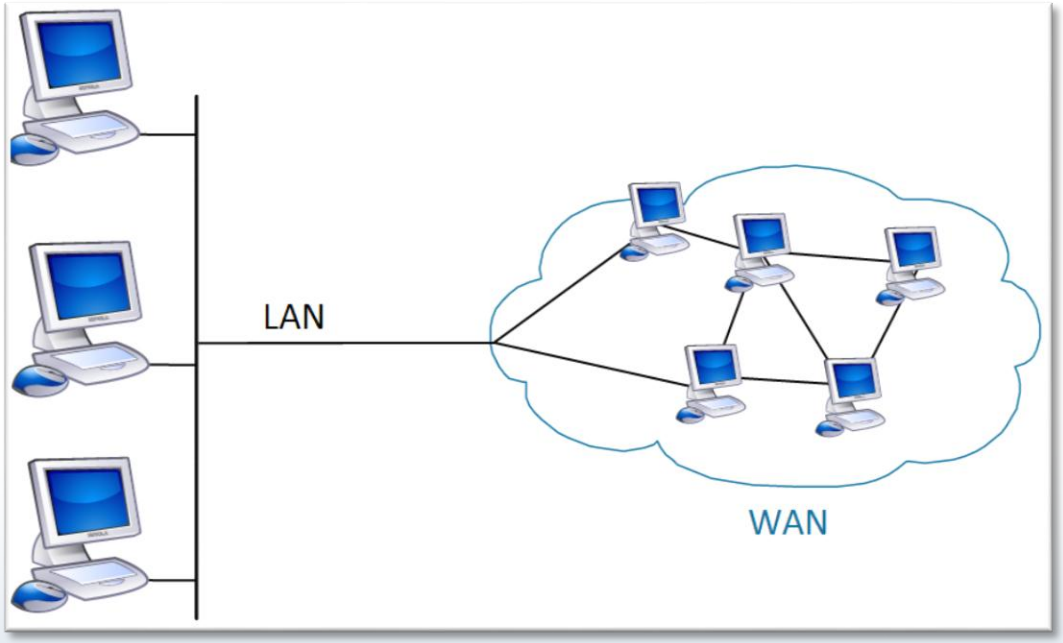


- Popular LAN implementation standard for wiring and signaling
- TCP/IP Link Layer
- OSI Physical and Data Layer 1/2
- Includes coaxial, twisted pair, and fiber
- IEEE 802.3



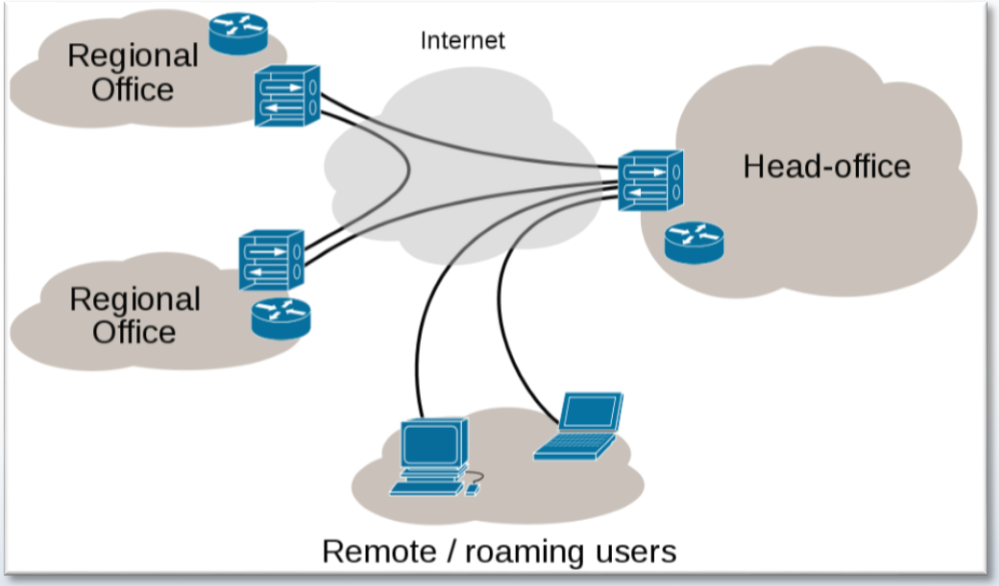
Wide Area Network (WAN)

- Any network that links ACROSS metropolitan, regional, or national boundaries
- Typically connects many LANs over long distances
- Can be public or private
- The Internet is an example of a public WAN



Virtual Private Network (VPN)

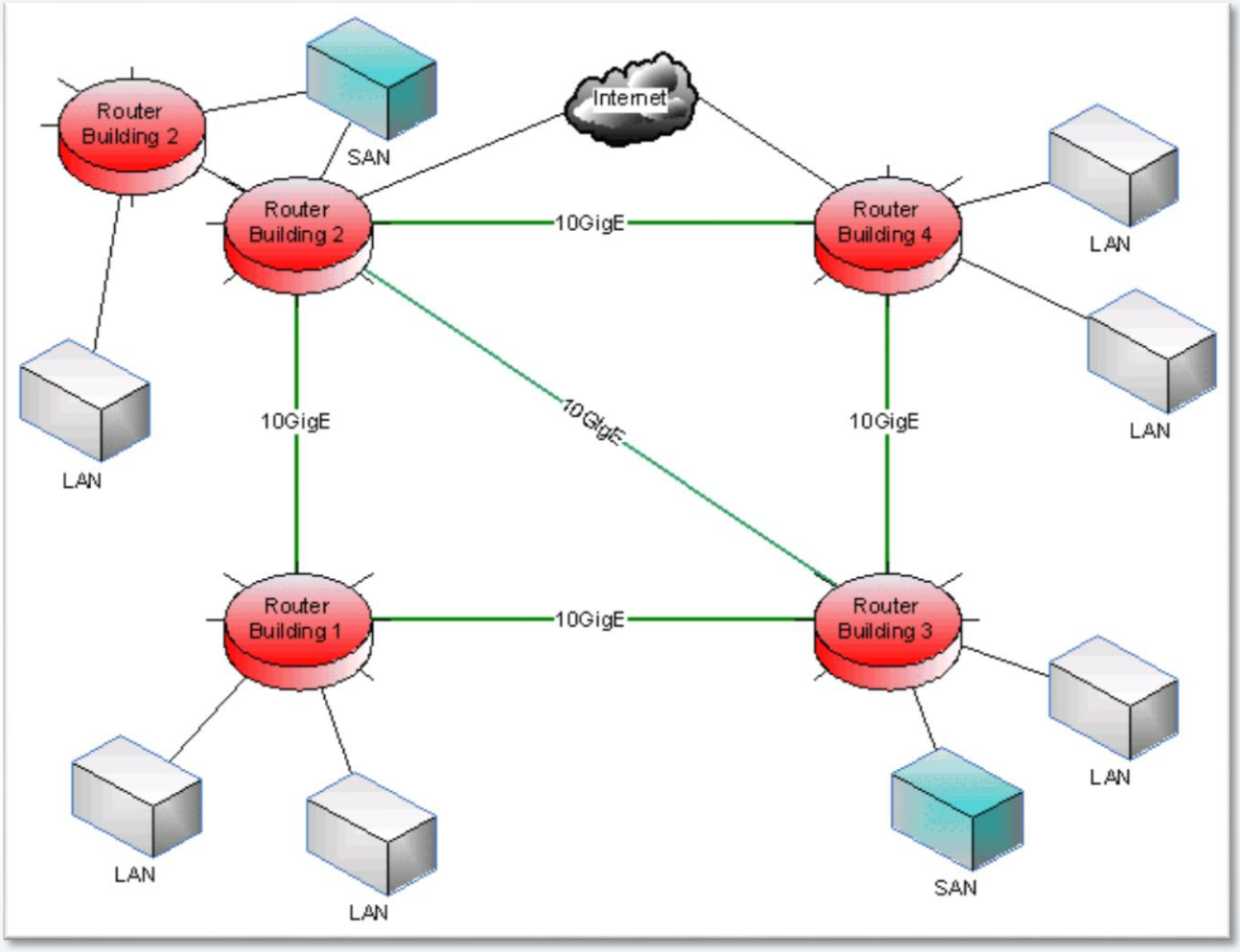
- Extends a private network using public networks or the Internet
- Retains the functionality, security, and management policies of the private network
- Uses tunneling and encryption to secure data
- Implemented using routers, servers, specialized devices, and client software
- Protocol options include: Cisco AnyConnect, IPsec, TLS/SSL, MPPE, OpenVPN, SSH



Metropolitan Area Network (MAN)

- Connects multiple networks or computers over metropolitan geographical area
- Can be private or public
- Can be owned by a single or multiple organizations
- Uses ATM, FDDI, SMDS, microwave, radio, infra-red laser, Metro Ethernet
- Specified by IEEE 802.6

Metropolitan Area Network (MAN)



Campus Area Network (CAN)

- Connects multiple LAN networks or computers over campus
- Campus can be educational institutions or corporate parks/campus
- Can be owned by a single or multiple organizations
- Uses fiber, twisted pair, wireless

- WLAN and WiFi Technologies

- Exchanges data wirelessly over a network using radio waves
- Based on IEEE (Institute of Electrical and Electronics Engineers) 802.11 standards
- Common name is WiFi

Wireless LAN History

- FCC (1985) releases ISM band (Industrial Scientific and Medical) including 2.4Ghz and 5Ghz
- AT&T/NCR (1991) precursor to 802.11, initially intended for cashier systems
- IEEE (1997) 802.11
- IEEE (9/1999) 802.11a and 802.11b
- IEEE (2003) 802.11g

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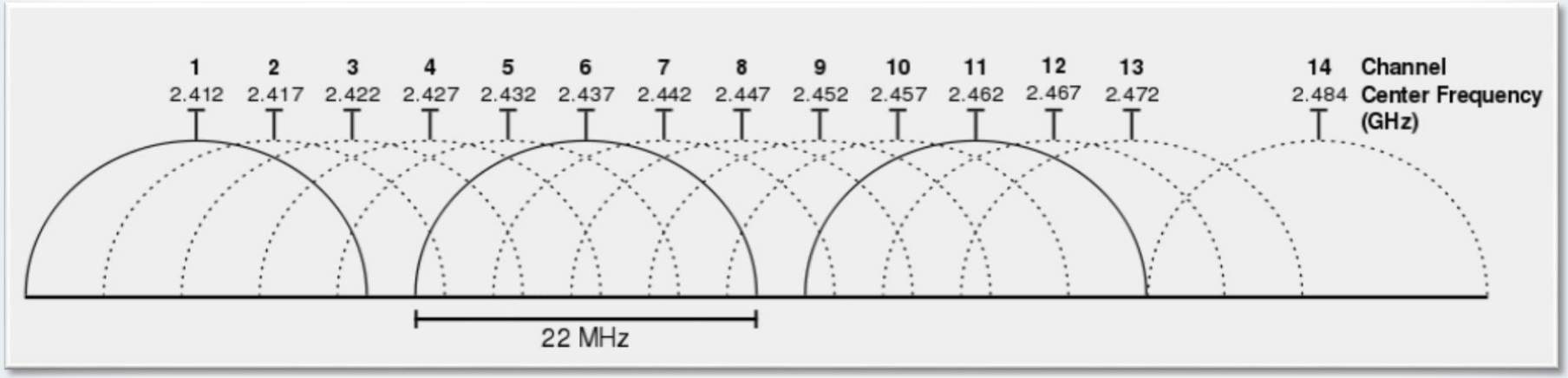
- IEEE (2003) 802.11g

Protocol	Data Rate (Mbit/s)	MIMO Streams (# of Antennas)	Max Indoor Range (ft)	Max Outdoor Range (ft)
802.11a	6,9,12,18,24, 36,48,54	1 OFDM	115	390
802.11b	1, 2, 5.5, 11	1 DSSS	115	460
802.11g	6, 9, 12, 18, 24, 36, 48, 54	1 OFDM	125	460

Protocol	Data Rate (Mbit/s)	MIMO Streams (# of Antennas)	Max Indoor Range (ft)	Max Outdoor Range (ft)
802.11n 20MHz	7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2	4 OFDM	230	820
802.11n 40MHz	6.5 - 600	4 BPSK, QPSK, QAM	230	820
802.11ac	up to 866.7	8 OFDM		

2.4Ghz Frequency

- 2.4Ghz to 2.5Ghz
- 13 channels spaced 5Mhz apart (Channel 1 @ 2.412Ghz)
- 11 channels in US
- 802.11n can use 40Mhz of spectrum



- Considerations before setup:
  - Wired or wireless?
  - Peer-to-peer or client/server-based?
  - Location of SOHO network?

- Cable length (if wired), device types and requirements, and compatibility issues are similar to larger environments

- Main limitation is number of devices

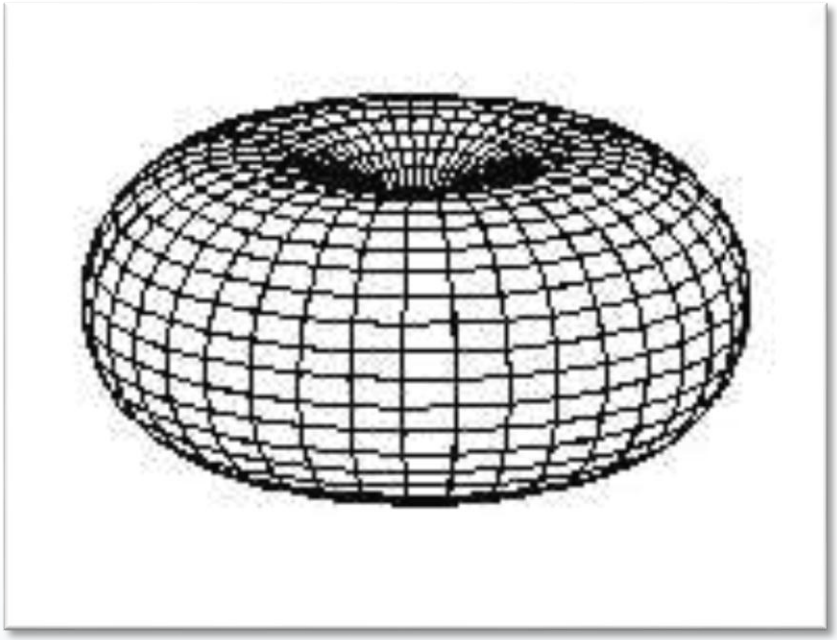
- Involves installing the wireless NIC in your computer
- Most modern laptop and smaller computers have built-in wireless NICs -- no installation needed
- Otherwise, two options:
  - PCMCIA / PC Port
  - USB based wireless NIC

Wireless Access Point (WAP)

- If single access point, locate centrally in relationship to wireless NIC
- Locate the WAP high in the environment
- The further a wireless NIC is from the access point, the slower
- Metal objects, cement, thick walls degrade signals

WAP Omni-directional Antennas

- Most WAPS come with Omni-directional Antennas
- Radiate signal in all directions similar to a light bulb



- Flat
- Beam
- Parabolic (satellite dishes)

Signal Strength

- The strength of a wireless signal when you are trying to send or receive information across a wireless network
- Factors that affect signal strength
  - Actual distance to WAP
  - Interference

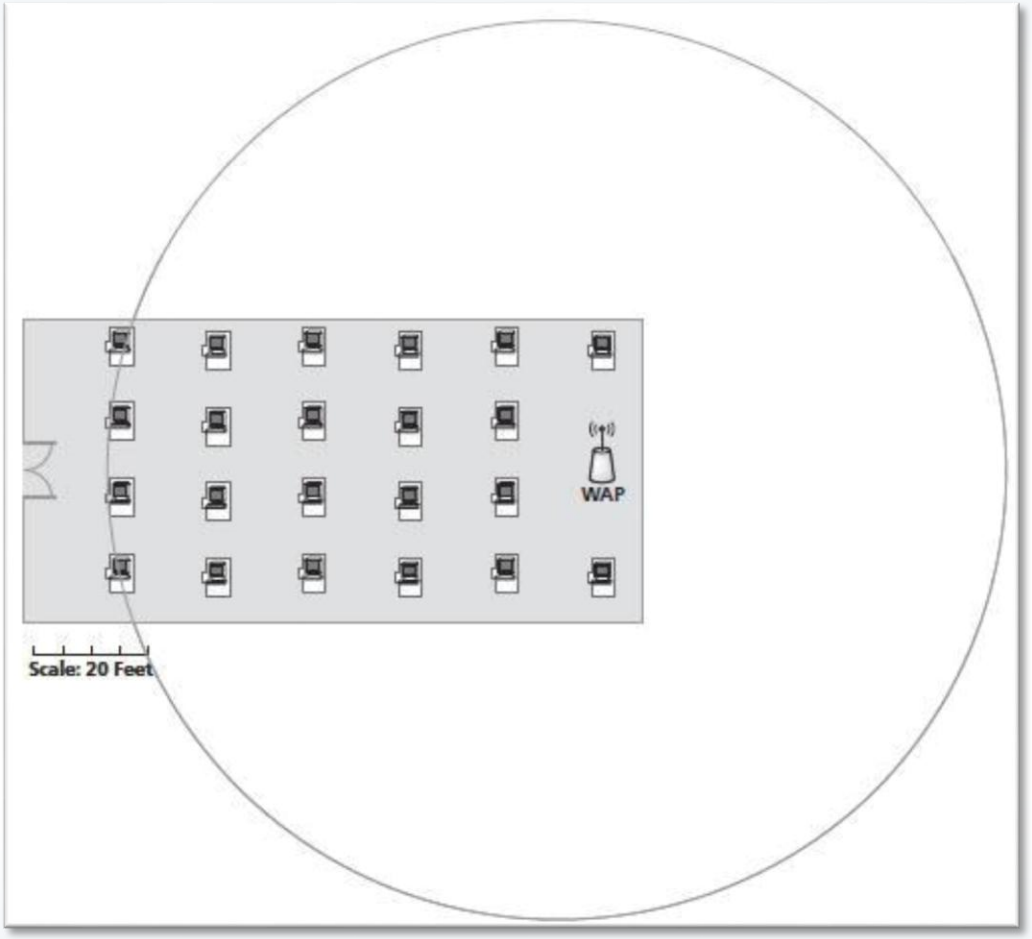
Beacon Frames

- A frame periodically broadcasted by a WAP to announce presence of the wireless network

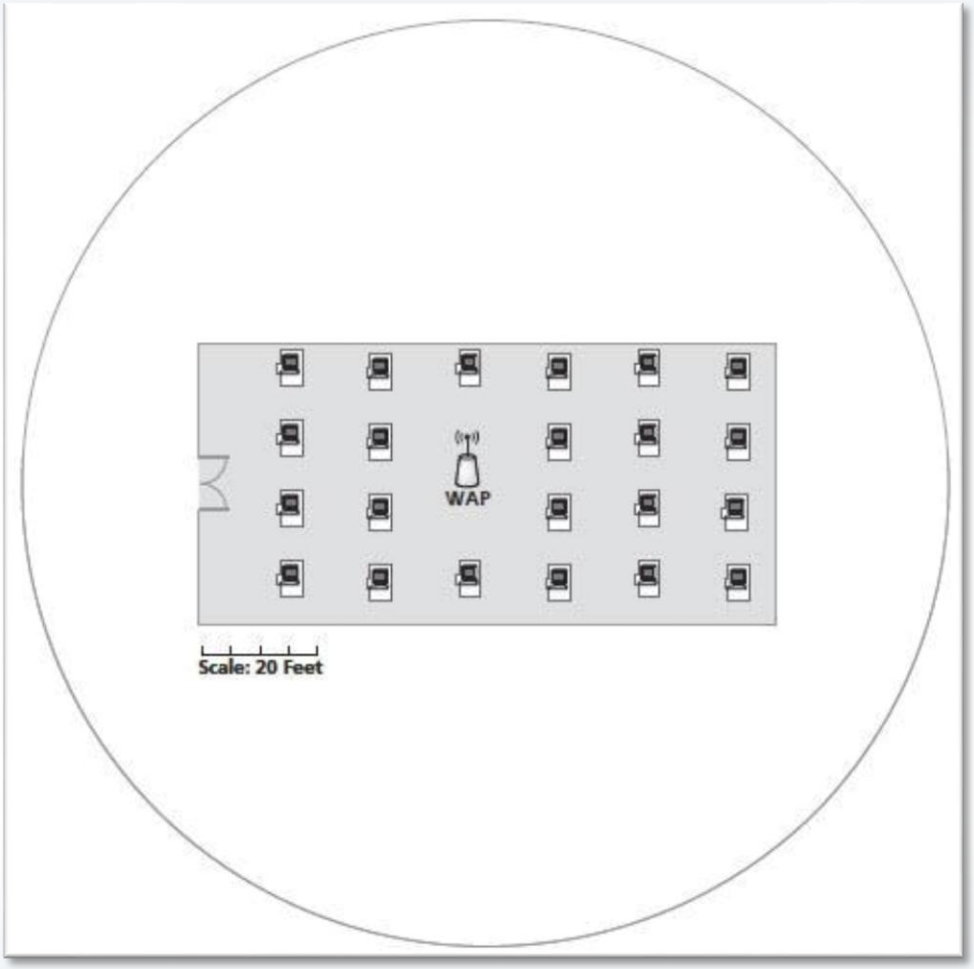
- Contains:
  - A MAC header identifying its MAC address
  - A body with relevant information about the wireless network
  - Timestamp, interval the beacon frame is broadcast on, and basic summary

- Interference
  - Any electromagnetic signal that interferes with passing data over a wireless network Examples: Electric motors and microwave ovens
  - Something that redirects wireless signals
  - Example: A building that uses steel studs in its walls rather than wooden ones

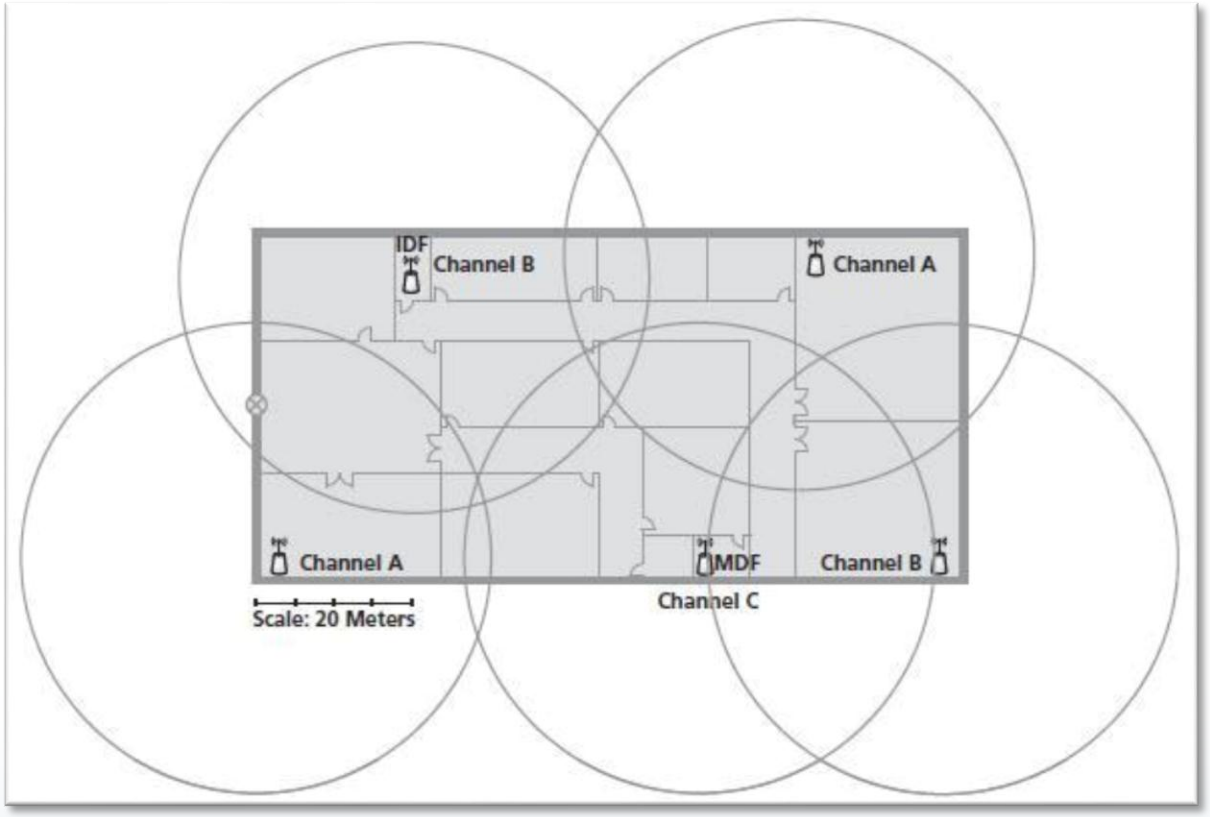
Deployment A Poorly Placed WAP



A Well-Placed WAP



Well placed WAPS = No WAP channel overlap



- May need multiple WAP(s)
  - Set individuals WAPs on different frequency
  - Use the same SSID and security
- Scan the RF spectrum in the area & choose a channel with little interference (smartphone apps)
- Use directional antennas

Service Set Identifiers (SSIDs)

- Extended Service Set Identifier (ESSID)
- Basic Service Set Identifier (BSSID
- BSSIDs identify independent wireless networks
  - Ad hoc or have a central access point
- ESSIDs used when two or more independent wireless networks are connected

Configure Appropriate Encryption

- WEP – Wired Equivalent Privacy
  - DO NOT USE

- WPA – Uses TKIP for older NIC cards

- WPA2 (WiFi Protected Access v2)
- -USE AES-CCMP over TKIP
- -Possible compatibility with AES and older wireless NIC cards

- Upgrade wireless cards or use both TKIP and AES
- WPS – Wifi Protected Setup
  - Sets up WPA encryption using PIN numbers and pairing of wireless devices to an access point which can be easier than making setting changes to SSID password, encryption, etc.
  - WPS can be used to gain access to a WPA2 encrypted network and should be disabled after initial configuration

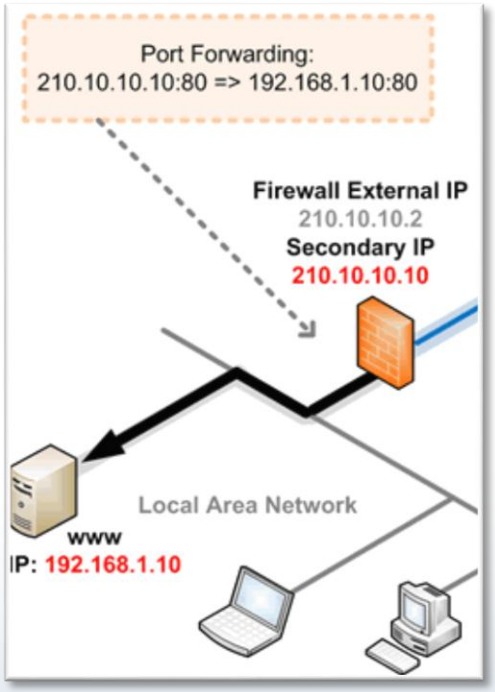
Quality of Service (QOS)

- Sets priority based on type of network traffic including:
  - Protocol
  - Source
  - Destination
  - IP address range
- Mostly used to improve network quality for VoIP and video service
- IEEE 802.11e

Port Forwarding

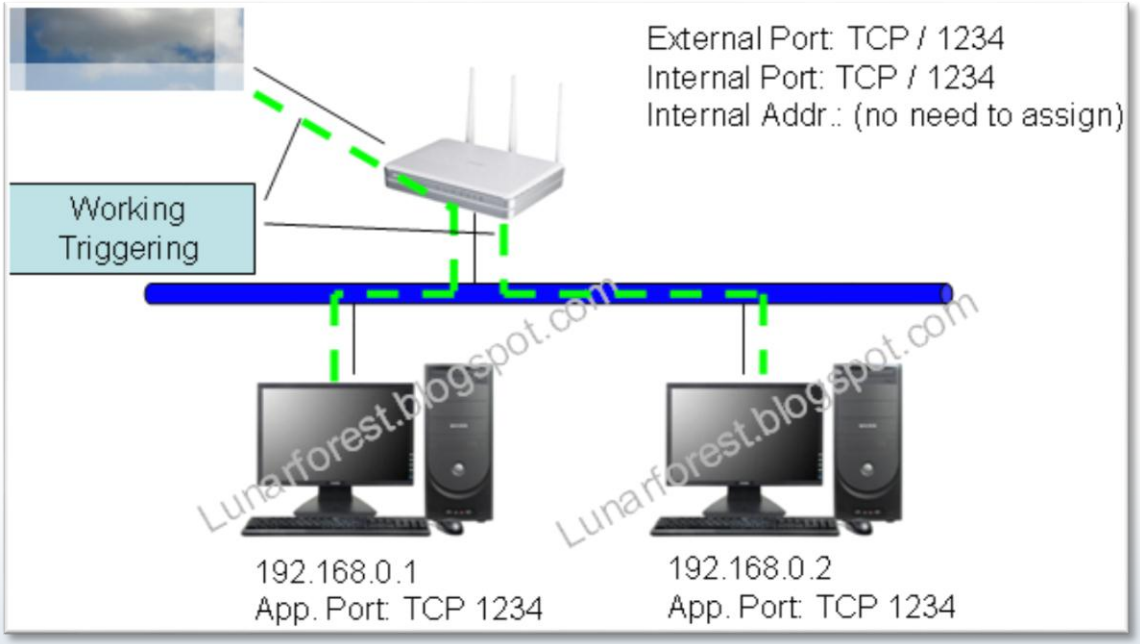
- Allows a remote computer to connect to a specific computer on a private network

- The incoming port (or range) is forwarded to a specific port (or range) at a specific IP address within the private network



Port Triggering

- Used with NAT
- A private network node (behind the firewall) makes an outbound connection through the firewall to an (i.e. port 6667)
- The firewall knows that when outbound port 6667 is used, to allow inbound port 113 to connect to the node making the outbound connection

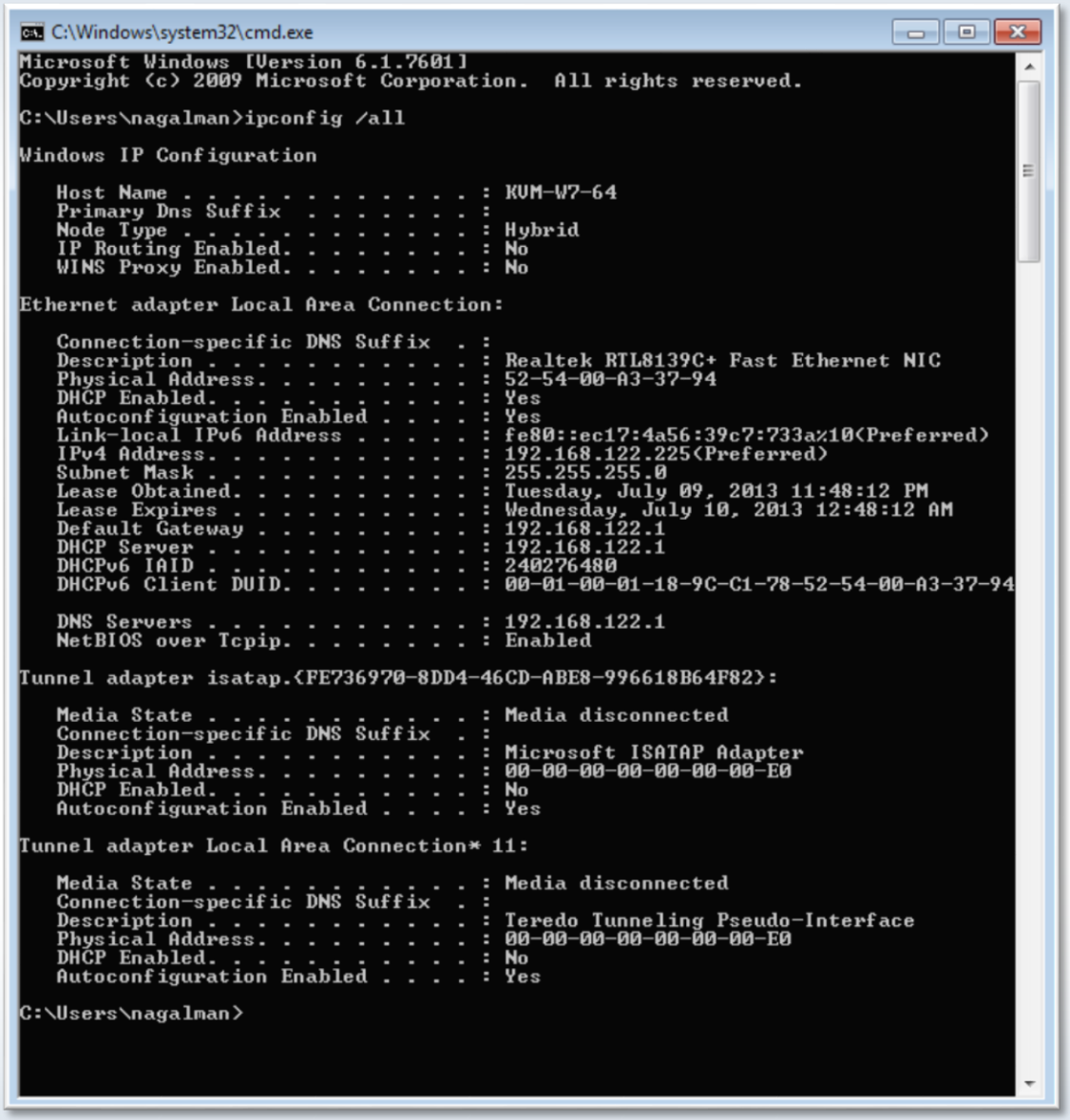


- Configure Appropriate RADIUS for authentication
- Disable the ESSID broadcast
- Separate “public” and “private” networks
  - VPN for private

Enforce MAC Filtering

- Only preprogrammed MAC addresses will be allowed access to a specific WAP
- Need configuration info from computer
- Windows - ipconfig command at command line to obtain MAC address of a NIC
- Linux/Mac – ifconfig/iwconfig command at command line to obtain MAC address of a NIC

Running Ipconfig



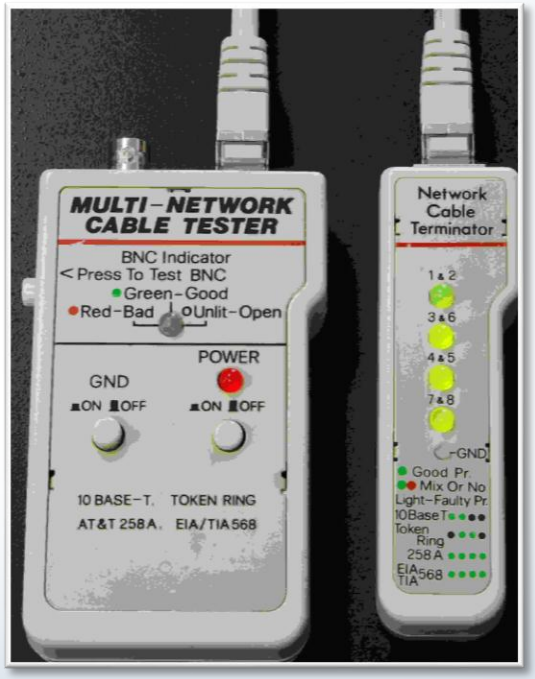
Verify Installation

- After installation and configuration, verify that:
  - You changed the default SSID and password
  - All network devices know the SSID
  - All devices that need access to the network are entered correctly into the MAC filter list (if applicable)

- Test wireless network to make sure that data is flowing across it

Network Tools - Cable Tester

- Electronic device used to verify the electrical connections in a cable.
- Includes:
  - A source of electric current,
  - A volt meter,
  - A switching matrix used to connect the current source and the volt meter to all of the contact points in a cable



Network Tools - Crimper

- Attaches cable media to the end connectors
- Many times includes a wire stripper
- Different crimper for different connectors

- Measures voltage, current, and resistance

- Used to check circuit boards, wires, and connections

Toner Probe

- Locates voice, audio, video, and data cabling by varying an audible tone or visual indicators

- Usually can test the operation of a cable via audio or visual indicators when connected to the cabling

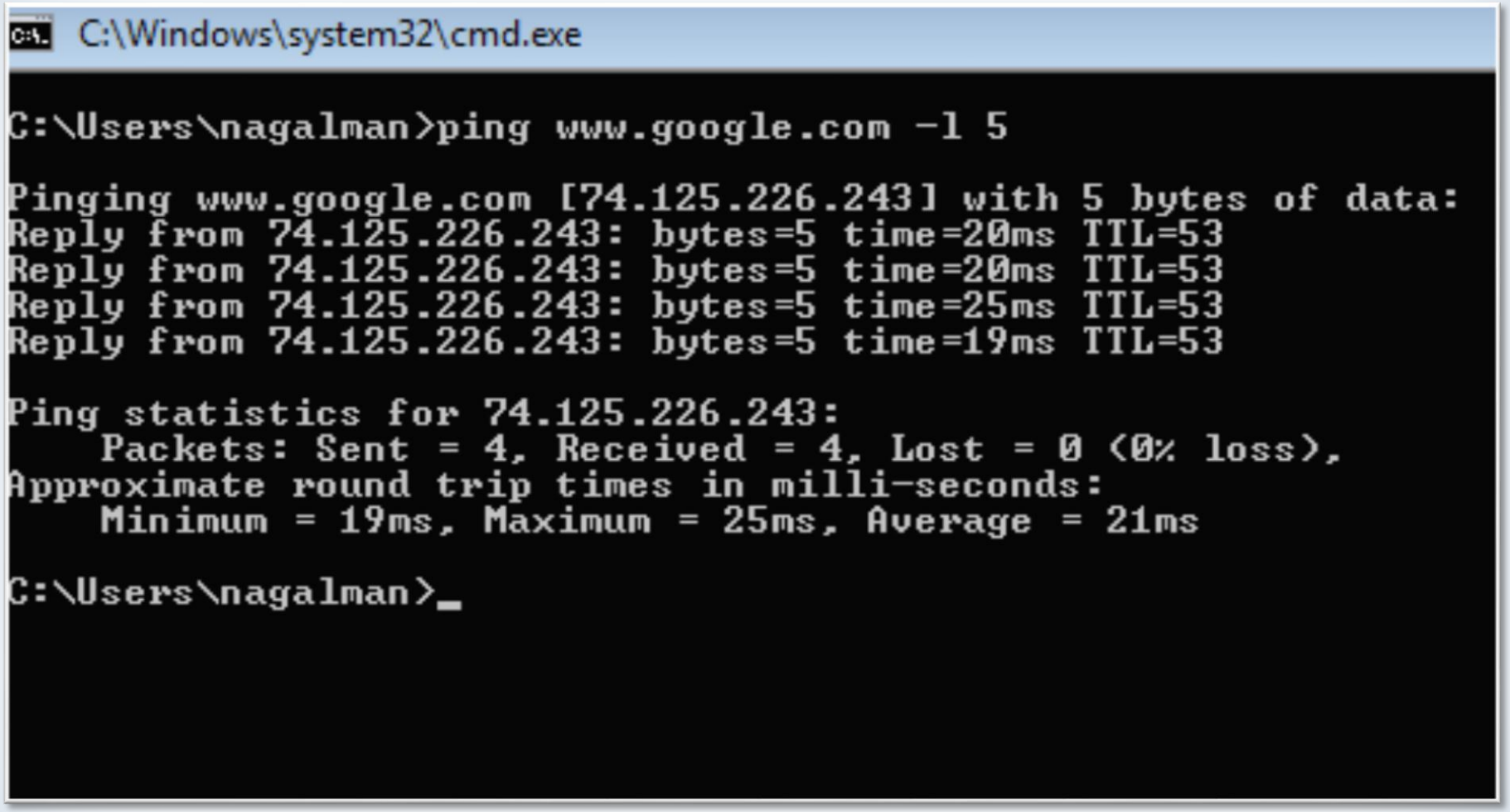
Loopback Plug

- Sends a signal back to device for testing
- Used to troubleshoot transmission problems

Punchdown Tool

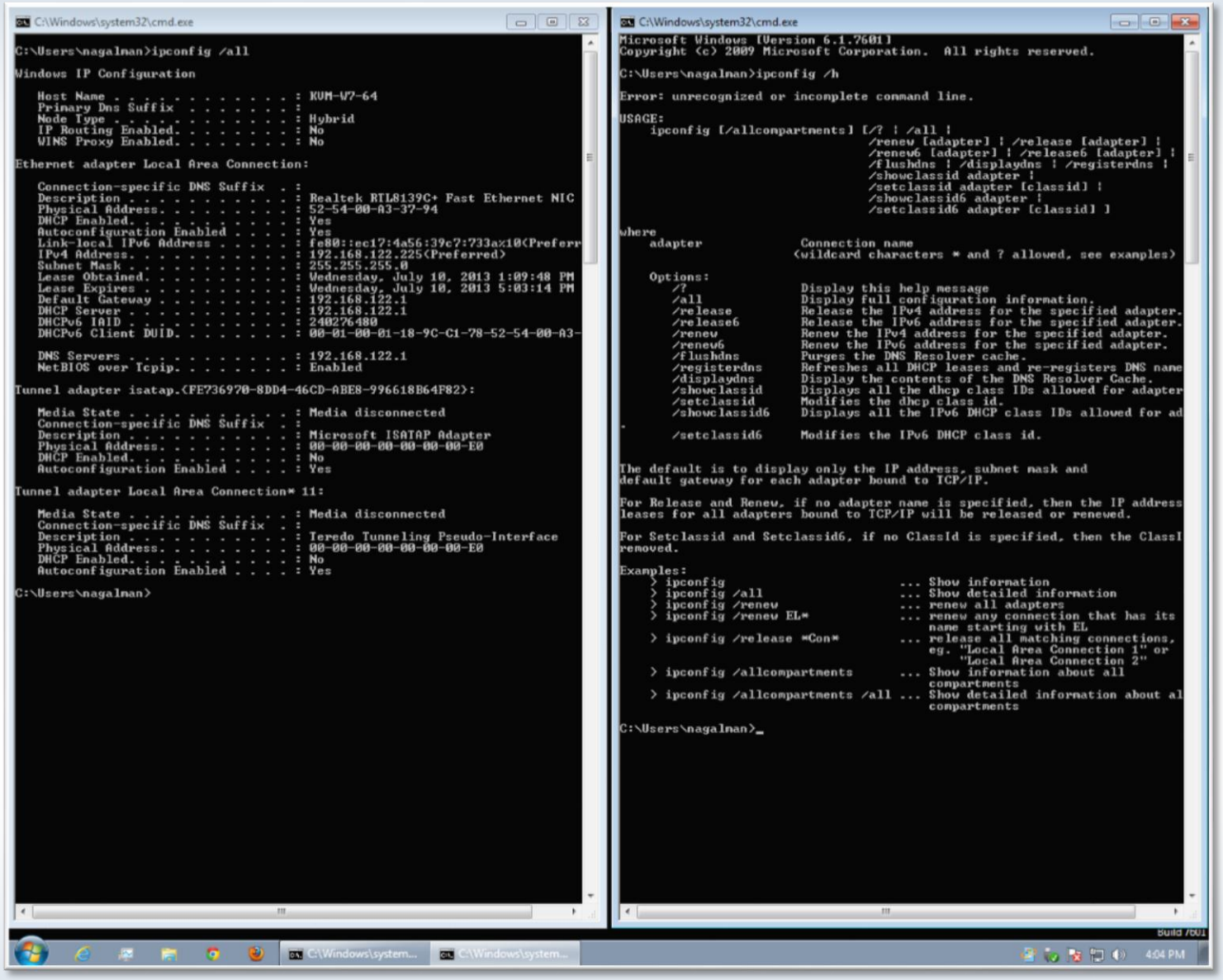
- Connects twisted pair wires to a patch panel
- Strips protection from the wire and embeds it to the connection on the patch panel, all in one motion

- Sends data packets to a computer on the network to test TCP/IP connectivity
- Reports if a reply is received, individual, minimum, maximum, average time it takes roundtrip
- ping google.com -l 5
- -l (number) = number of attempts for ping
- CTRL – C to stop

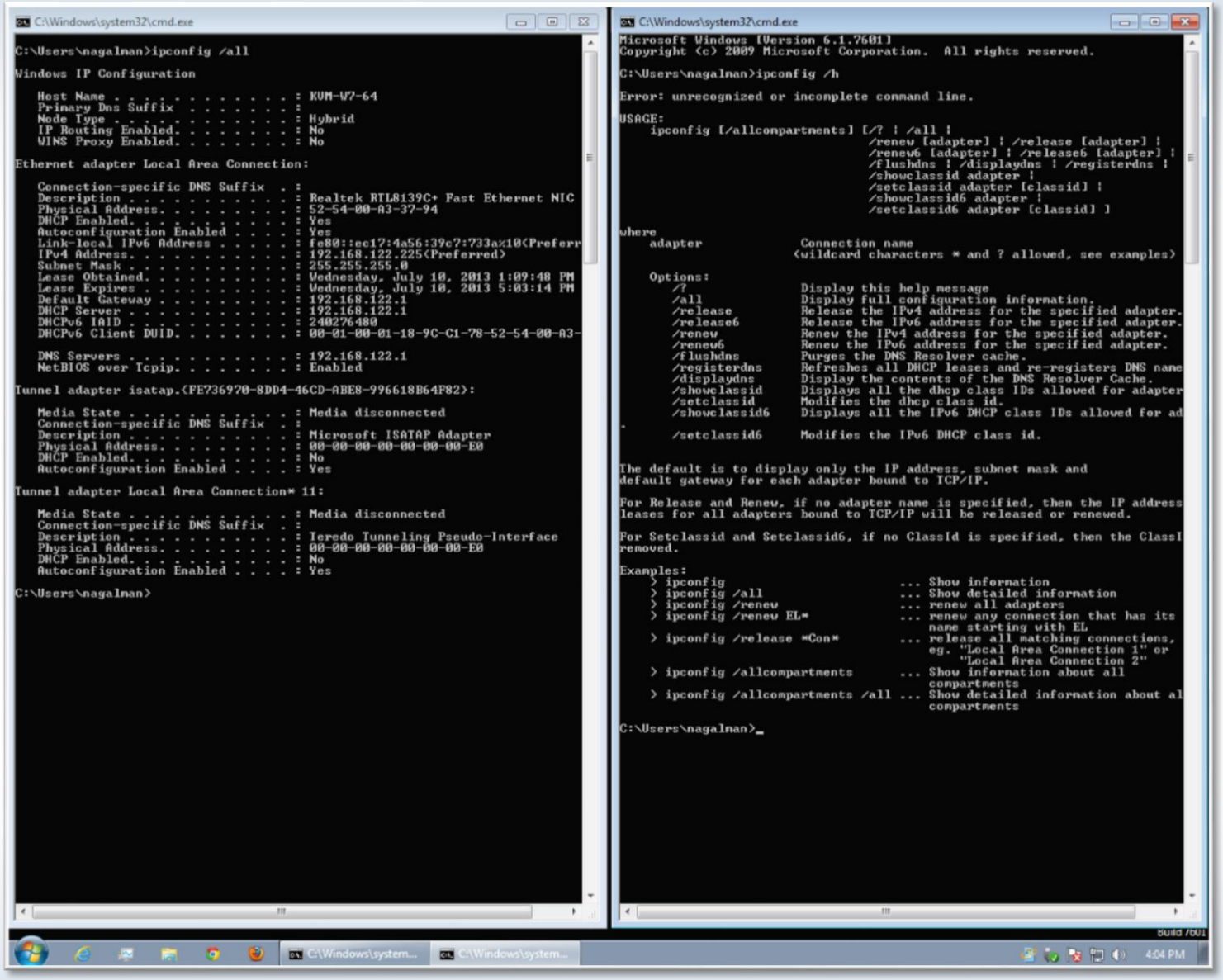

C:\Windows\system32\cmd.exe
C:\Users\nagalman>ping www.google.com -l 5
Pinging www.google.com [74.125.226.243] with 5 bytes of data:
Reply from 74.125.226.243: bytes=5 time=20ms TTL=53
Reply from 74.125.226.243: bytes=5 time=20ms TTL=53
Reply from 74.125.226.243: bytes=5 time=25ms TTL=53
Reply from 74.125.226.243: bytes=5 time=19ms TTL=53
Ping statistics for 74.125.226.243:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 19ms, Maximum = 25ms, Average = 21ms
C:\Users\nagalman>

- Displays network setting information
- Releases and renews DHCP configuration from a network device
- ipconfig /all
- ipconfig /release
- ipconfig /renew

ipconfig


C:\Windows\system32\cmd.exe
C:\Users\nagalman>ipconfig /all
Windows IP Configuration
Host Name . . . . . : KVM-W7-64
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
Description . . . . . : Realtek RTL8139C+ Fast Ethernet NIC
Physical Address. . . . . : 52-54-00-A3-37-94
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ec17:4a56:39c7:733a%10(Preferr
IPv4 Address. . . . . : 192.168.122.225(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Wednesday, July 10, 2013 1:09:48 PM
Lease Expires . . . . . : Wednesday, July 10, 2013 5:03:14 PM
Default Gateway . . . . . : 192.168.122.1
DHCP Server . . . . . : 192.168.122.1
DHCPv6 IAID . . . . . : 240276480
DHCPv6 Client DUID. . . . . : 00-01-00-01-18-9C-C1-78-52-54-00-A3-
DNS Servers . . . . . : 192.168.122.1
NetBIOS over Tcpip. . . . . : Enabled
Tunnel adapter isatap.{FE736970-8DD4-46CD-ABE8-996618B64F82}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft ISATAP Adapter
Physical Address. . . . . : 00-00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Tunnel adapter Local Area Connection* 11:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Teredo Tunneling Pseudo-Interface
Physical Address. . . . . : 00-00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
C:\Users\nagalman>
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\nagalman>ipconfig /h
Error: unrecognized or incomplete command line.
USAGE:
ipconfig [/allcompartments] [/? | /all |
/renew [adapter] | /release [adapter] |
/renew6 [adapter] | /release6 [adapter] |
/flushdns | /displaydns | /registerdns |
/showclassid adapter |
/setclassid adapter [classid] |
/showclassid6 adapter |
/setclassid6 adapter [classid]]
where
adapter Connection name
(wildcard characters * and ? allowed, see examples)
Options:
/? Display this help message
/all Display full configuration information.
/release Release the IPv4 address for the specified adapter.
/release6 Release the IPv6 address for the specified adapter.
/renew Renew the IPv4 address for the specified adapter.
/renew6 Renew the IPv6 address for the specified adapter.
/flushdns Purges the DNS Resolver cache.
/registerdns Refreshes all DHCP leases and re-registers DNS name
/displaydns Display the contents of the DNS Resolver Cache.
/showclassid Displays all the dhcp class IDs allowed for adapter
/setclassid Modifies the dhcp class id.
/showclassid6 Displays all the IPv6 DHCP class IDs allowed for ad
/setclassid6 Modifies the IPv6 DHCP class id.
The default is to display only the IP address, subnet mask and
default gateway for each adapter bound to TCP/IP.
For Release and Renew, if no adapter name is specified, then the IP address
leases for all adapters bound to TCP/IP will be released or renewed.
For Setclassid and Setclassid6, if no ClassId is specified, then the ClassI
removed.
Examples:
> ipconfig ... Show information
> ipconfig /all ... Show detailed information
> ipconfig /renew ... renew all adapters
> ipconfig /renew EL* ... renew any connection that has its name starting with EL
> ipconfig /release *Con* ... release all matching connections, eg. "Local Area Connection 1" or "Local Area Connection 2"
> ipconfig /allcompartments ... Show information about all compartments
> ipconfig /allcompartments /all ... Show detailed information about al compartments
C:\Users\nagalman>
4:04 PM

ipconfig


C:\Windows\system32\cmd.exe
C:\Users\nagalman>ipconfig /all
Windows IP Configuration
Host Name . . . . . : KVM-W7-64
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
Description . . . . . : Realtek RTL8139C+ Fast Ethernet NIC
Physical Address. . . . . : 52-54-00-A3-37-94
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::ec17:4a56:39c7:733ax10(Preferr
IPv4 Address. . . . . : 192.168.122.225(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Wednesday, July 10, 2013 1:09:48 PM
Lease Expires . . . . . : Wednesday, July 10, 2013 5:03:14 PM
Default Gateway . . . . . : 192.168.122.1
DHCP Server . . . . . : 192.168.122.1
DHCPv6 IAID . . . . . : 240276480
DHCPv6 Client DUID. . . . . : 00-01-00-01-18-9C-C1-78-52-54-00-A3-
DNS Servers . . . . . : 192.168.122.1
NetBIOS over Tcpip. . . . . : Enabled
Tunnel adapter isatap.{FE736970-8DD4-46CD-ABE8-996618B64F82}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft ISATAP Adapter
Physical Address. . . . . : 00-00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Tunnel adapter Local Area Connection* 11:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Teredo Tunneling Pseudo-Interface
Physical Address. . . . . : 00-00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
C:\Users\nagalman>
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\nagalman>ipconfig /h
Error: unrecognized or incomplete command line.
USAGE:
ipconfig [/allcompartments] [/? | /all |
/renew [adapter] | /release [adapter] |
/renew6 [adapter] | /release6 [adapter] |
/flushdns | /displaydns | /registerdns |
/showclassid adapter |
/setclassid adapter [classid] |
/showclassid6 adapter |
/setclassid6 adapter [classid]]
where
adapter Connection name
(wildcard characters * and ? allowed, see examples)
Options:
/? Display this help message
/all Display full configuration information.
/release Release the IPv4 address for the specified adapter.
/release6 Release the IPv6 address for the specified adapter.
/renew Renew the IPv4 address for the specified adapter.
/renew6 Renew the IPv6 address for the specified adapter.
/flushdns Purges the DNS Resolver cache.
/registerdns Refreshes all DHCP leases and re-registers DNS name
/displaydns Display the contents of the DNS Resolver Cache.
/showclassid Displays all the dhcp class IDs allowed for adapter
/setclassid Modifies the dhcp class id.
/showclassid6 Displays all the IPv6 DHCP class IDs allowed for ad
/setclassid6 Modifies the IPv6 DHCP class id.
The default is to display only the IP address, subnet mask and
default gateway for each adapter bound to TCP/IP.
For Release and Renew, if no adapter name is specified, then the IP address
leases for all adapters bound to TCP/IP will be released or renewed.
For Setclassid and Setclassid6, if no ClassId is specified, then the ClassI
removed.
Examples:
> ipconfig ... Show information
> ipconfig /all ... Show detailed information
> ipconfig /renew ... renew all adapters
> ipconfig /renew EL* ... renew any connection that has its
name starting with EL
> ipconfig /release *Con* ... release all matching connections,
eg. "Local Area Connection 1" or
"Local Area Connection 2"
> ipconfig /allcompartments ... Show information about all
compartments
> ipconfig /allcompartments /all ... Show detailed information about al
compartments
C:\Users\nagalman>_
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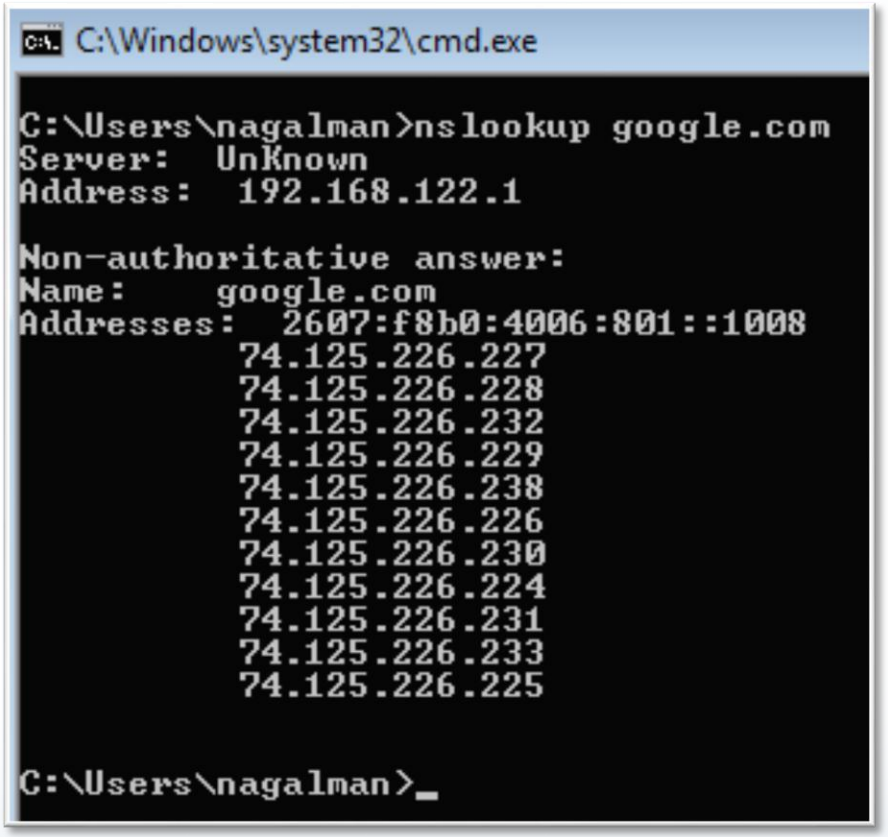
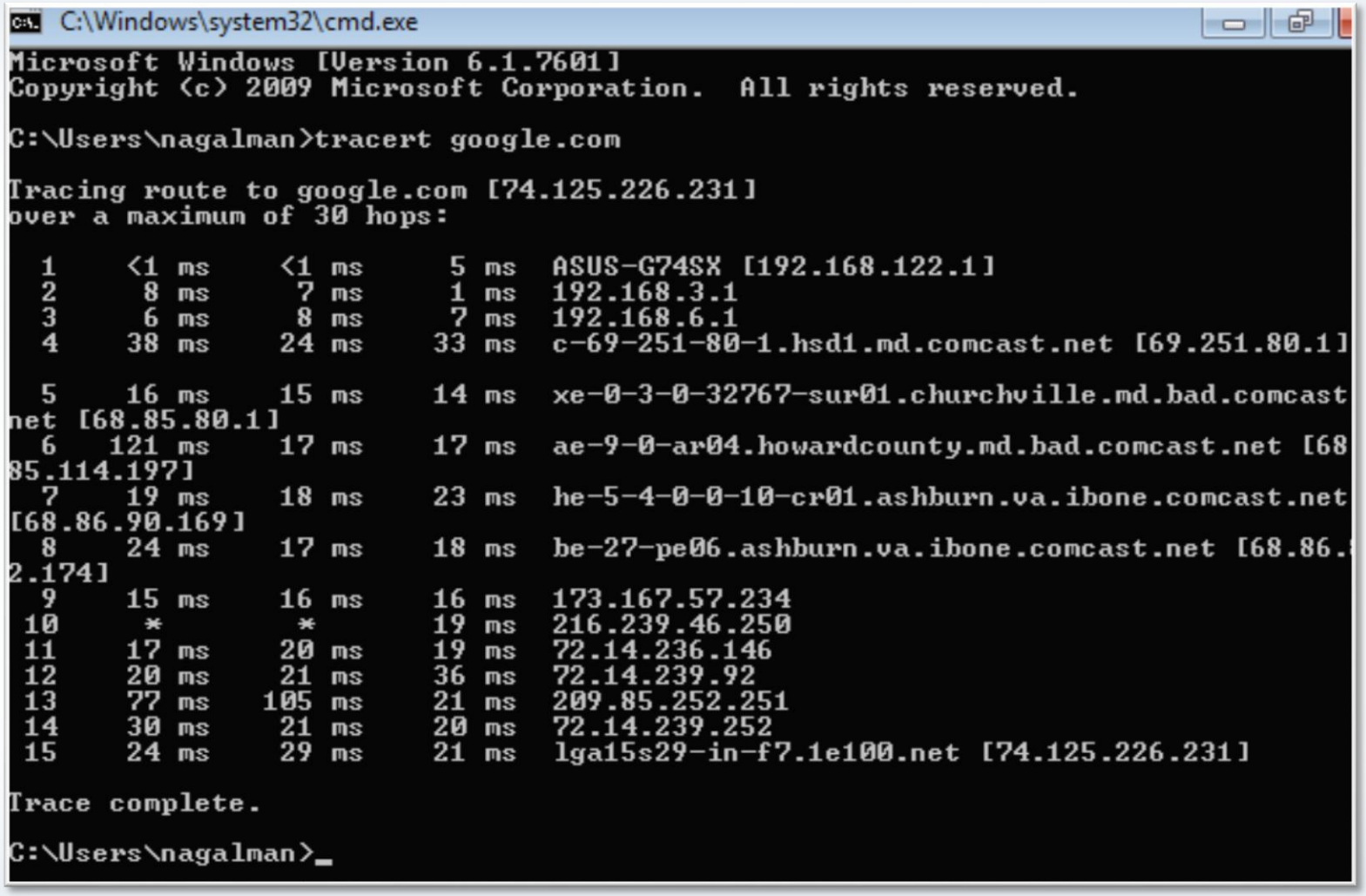
- Verifies a computer can connect to a DNS server and successfully find an IP address for FQDN

- nslookup google.com



- Indicates
  - Named connections and hops along the route to a particular destination for a packet
  - Times for each hop
- tracert google.com


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\nagalman>tracert google.com
Tracing route to google.com [74.125.226.231]
over a maximum of 30 hops:
1 <1 ms <1 ms 5 ms ASUS-G74SX [192.168.122.1]
2 8 ms 7 ms 1 ms 192.168.3.1
3 6 ms 8 ms 7 ms 192.168.6.1
4 38 ms 24 ms 33 ms c-69-251-80-1.hsd1.md.comcast.net [69.251.80.1]
5 16 ms 15 ms 14 ms xe-0-3-0-32767-sur01.churchville.md.bad.comcast
net [68.85.80.1]
6 121 ms 17 ms 17 ms ae-9-0-ar04.howardcounty.md.bad.comcast.net [68
85.114.197]
7 19 ms 18 ms 23 ms he-5-4-0-0-10-cr01.ashburn.va.ibone.comcast.net
[68.86.90.169]
8 24 ms 17 ms 18 ms be-27-pe06.ashburn.va.ibone.comcast.net [68.86.
2.174]
9 15 ms 16 ms 16 ms 173.167.57.234
10 * * 19 ms 216.239.46.250
11 17 ms 20 ms 19 ms 72.14.236.146
12 20 ms 21 ms 36 ms 72.14.239.92
13 77 ms 105 ms 21 ms 209.85.252.251
14 30 ms 21 ms 20 ms 72.14.239.252
15 24 ms 29 ms 21 ms lga15s29-in-f7.1e100.net [74.125.226.231]
Trace complete.
C:\Users\nagalman>

- Indicates
  - List active connection, protocol, local, and destination address

- netstat

- Allows control of Microsoft network from the command line
- net /?


C:\Windows\system32\cmd.exe
C:\Users\nagalman>net STATISTICS Workstation
Workstation Statistics for \\KVM-W7-64
Statistics since 7/10/2013 1:09:48 PM
Bytes received 0
Server Message Blocks (SMBs) received 13
Bytes transmitted 0
Server Message Blocks (SMBs) transmitted 0
Read operations 0
Write operations 0
Raw reads denied 0
Raw writes denied 0
Network errors 0
Connections made 0
Reconnections made 0
Server disconnects 0
Sessions started 0
Hung sessions 0
Failed sessions 0
Failed operations 0
Use count 0
Failed use count 0
The command completed successfully.
C:\Users\nagalman>

THANK YOU