Trainer: James Conrad

Videos in course:

Total Course Duration: 10:05:28

Series Intro ~~00:02:47~~ 2 minute preview

This introductory training Nugget will cover the 98-366 certification and all the topics we will cover, to prepare you for work and the certification exam.

Network Infrastructure Concepts, Part 1 ~~00:55:01~~ 2 minute preview

This Nugget training video will teach you to understand the concepts of Internet, intranet, extranet, and security zones.

Network Infrastructure Concepts, Part 2 ~~00:20:25~~ 2 minute preview

This training Nugget covers concepts of firewalls, including CheckPoint firewall, VPN, SSTP, PPTP, L2TP, IKEv2, DMZ, demilitarized zone, and perimeter network.

Local Area Networks ~~00:42:22~~ 2 minute preview

Let the LAN training begin! Understand local area networks (LANs). Perimeter networks; addressing; reserved address ranges for local use (including local loopback ip); VLANs; wired LAN and wireless LAN; peer-to-peer network; client-server network; switch, hub; repeater; router; gigabit ethernet; 10Gbe; 10 gigabit ethernet. Examples of devices.

Wide Area Networks ~~00:29:38~~ 2 minute preview

Understand wide area networks (WANs), including leased lines, dial-up, ISDN, VPN, T1, T3, E1, E3, DSL, cable, etc., and their characteristics (speed, availability). Map T1 a LAN or WAN, modem, ISDN, integrated services data network, BRI, basic rate interface, PRI, primary rate interface, OC-1, OC-3, OC-12, OC-48, OC-192, digital subscriber line, cable modem, asynchronous transfer mode, ATM, VDSL, ADSL.

Wireless Networking ~~00:40:45~~ 2 minute preview

Understand wireless networking. Types of wireless networking standards and their characteristics (802.11A,B,G,N including different Ghz ranges), types of network security (WPA/WEP/802.1X etc.), point-to-point (P2P) wireless, wireless bridging, WPA2, wi-fi protected access, wired equivalency protocol, SSID, security set identifier, MAC address, administrator password, SMAC, wepcrack

Topology and Access Methods ~~00:31:24~~ 2 minute preview

Understand network topologies and access methods. Bus, token ring, ring, mesh, partial mesh, star, hub and spoke, ethernet, ethernet frames, CAT5, CAT5e, CAT6, CAT7, category cable, twisted pair cable, media access method

OSI and TCP Models ~~00:42:18~~ 2 minute preview

Understand the OSI model; TCP model; examples of devices, protocols, applications and which OSI/TCP layer they belong to; TCP and UDP; well-known ports for most used purposes (not necessarily Internet); packets and frames, Department of Defense Model (DOD model), FTP, HTTP, HTTPS, TLS, SSL, SNMP, IMAP4, POP3, NetBIOS, DNS, physical, datalink, network, transport, session, presentation, application

Switches ~~00:43:13~~ 2 minute preview

Understand switches, including transmission speed; number and type of ports; number of uplinks; speed of uplinks; managed or unmanaged switches; VLAN capabilities; Layer 2 and Layer 3 switches; security options; hardware redundancy; support; backplane speed; switching types, mac table; understanding capabilities of hubs vs. switches; sub-VLAN; console port; store-and-forward switches; crossover cable; cut-through (real-time) mode; FragmentFree (Modified Cut-Through); secure MAC address; dynamic mac; static mac; sticky mac; VLAN opping; trunk connections; switchport mode access; private VLAN; DHCP snooping; rogue DHCP; spanning tree attack; CDP; physical security; SSH

Routers ~~00:47:00~~ 2 minute preview

Understanding routers. Transmission speed considerations, directly connected routes, static routing, dynamic routing (routing protocols), default routes; routing table and how it selects best route(s); routing table memory, NAT, software routing in Windows Server, RIP, routing internet protocol, open shortest path first, OSPF, IGRP, EIGRP, link state protocols, distance-vector protocol, the ROUTE command

Media ~~00:21:58~~ 2 minute preview

Understand media types. Cable types and their characteristics, including media segment length and speed; fiber optic; twisted pair shielded or nonshielded; catxx cabling, wireless; ; susceptibility to external interference (machinery, power cables, etc); susceptibility to electricity (lightning), susceptibility to interception, plenum-rated, STP, UTP, LC, Lucent connector, ST, straight tip connector, SC, square connector, BNC, british naval connector

IPv4 ~~00:47:56~~ 2 minute preview

Understanding IPv4. Subnetting, converting decimal and binary numbers, subnet mask, gateway, packets, reserved address ranges for local use, (including local loopback IP). Custom subnetting, ANDing process.

IPv6 ~~00:37:47~~ 2 minute preview

Understanding IPv6. Subnetting; IPconfig; why use IPv6; addressing; IPv4 to IPv6 tunneling protocols to ensure backwards compatibility; dual IP stack; subnetmask; gateway; ports; packets; reserved address ranges for local use (including local loopback ip) 4to6, 6to4, teredo, ISATAP, intra-site automatic tunneling protocol.

Name Resolution Part 1 ~~00:21:18~~ 2 minute preview

Understanding names resolution. DNS, WINS, steps in the name resolution process, netbios names, hosts file, lmhosts file, broadcasts

Name Resolution Part 2 ~~00:42:31~~ 2 minute preview

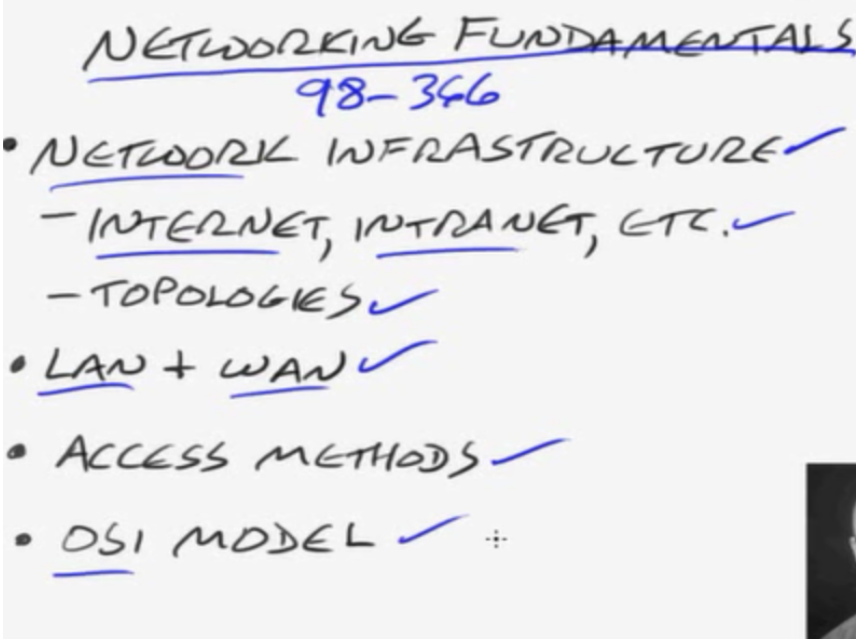
Understanding names resolution, part 2. DNS, WINS, steps in the name resolution process, netbios names, broadcasts, global names zone, GNZ, installing and configuring WINS, installing and configuring DNS

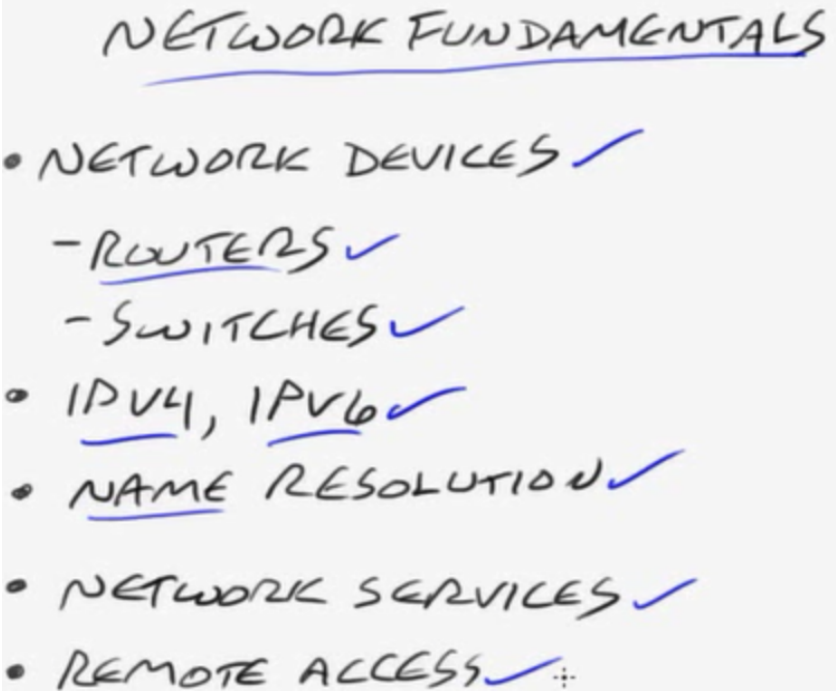
Network Services ~~00:49:14~~ 2 minute preview

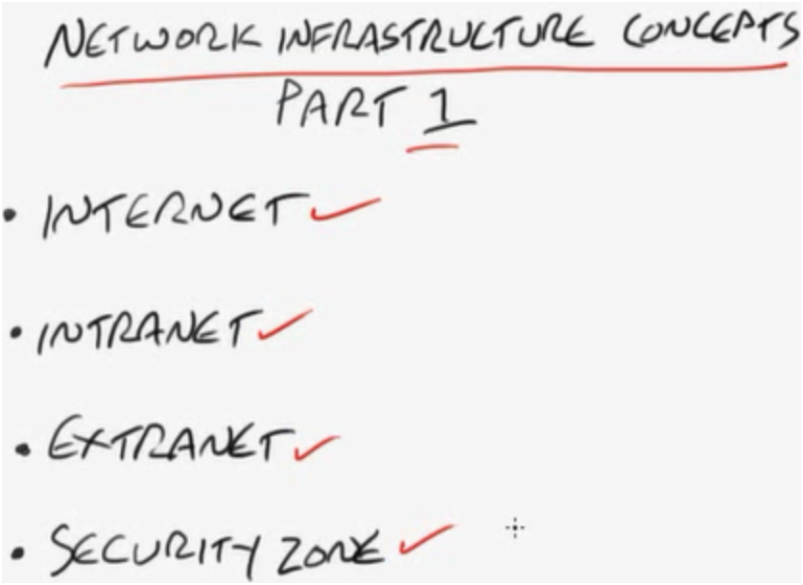
Understanding networking services. DHCP, command line TCP/IP tools, understand TCP/IP. Ping; tracert; pathping; Telnet; IPconfig; netstat; net use.

Remote Access ~~00:29:51~~ 2 minute preview

Understanding remote access. Virtual private networks, VPN, layer two tunneling protocol, L2TP, point-to-point tunneling protocol, PPTP, Internet Key Exchange v2, IKEv2, Direct Access, secure socket tunneling protocol, SSTP, routing and remote access server, RRAS, Remote access dial-in user service, RADIUS





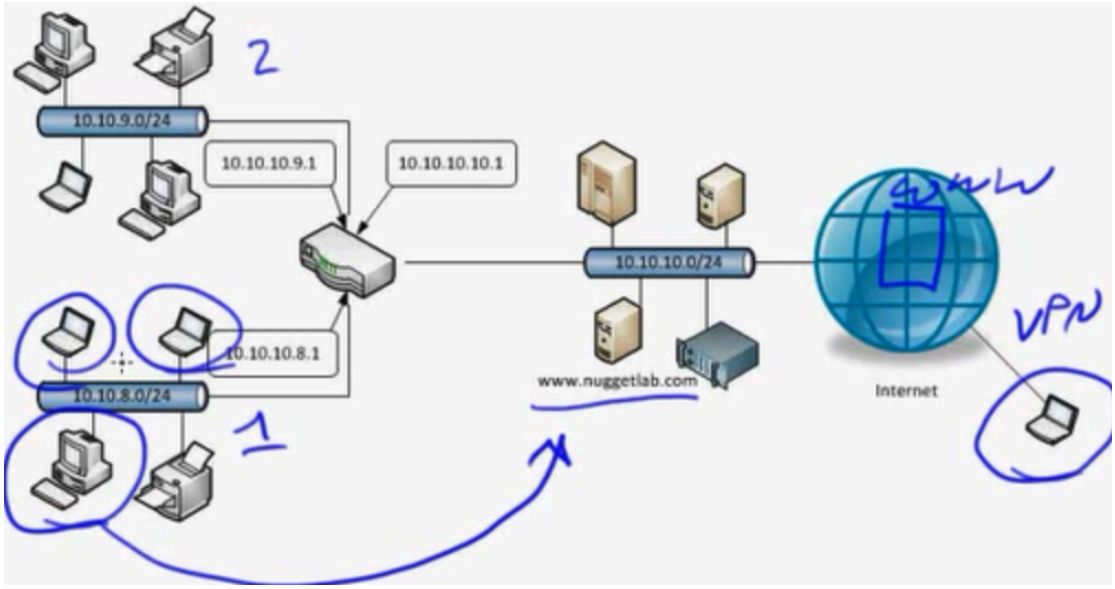


->http(hyper text transfer protocol)(www)
->pop3/smtp/imap(mail)(exchange/outlook/windows live mail)
->cuteFTP(ftp)
->sccp/sip(voip)(cisco/avaya)(all phone line services are moving to packet-switched networks)

INTRANET

- INTERNET-LIKE SERVICES
  - TCP/IP PROTOCOLS
  - WWW, FTP, MAIL, ETC.
  - NOT PUBLICLY AVAILABLE
  - ACCESSIBLE TO AUTHORIZED COMPANY USERS

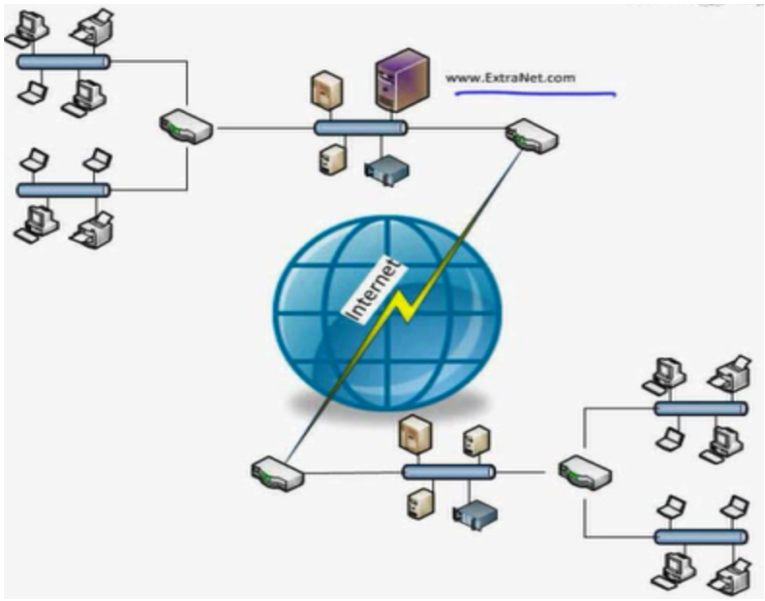
->intranet=internet for internal employees only



EXTRANET

- AN INTRANET ACCESSIBLE TO AUTHORIZED OUTSIDERS ✓
  - SOMETIMES VARYING LEVELS OF ACCESS
  - BUSINESS PARTNERS, EDUCATION, SUPPLIERS, VENDORS, CUSTOMERS..

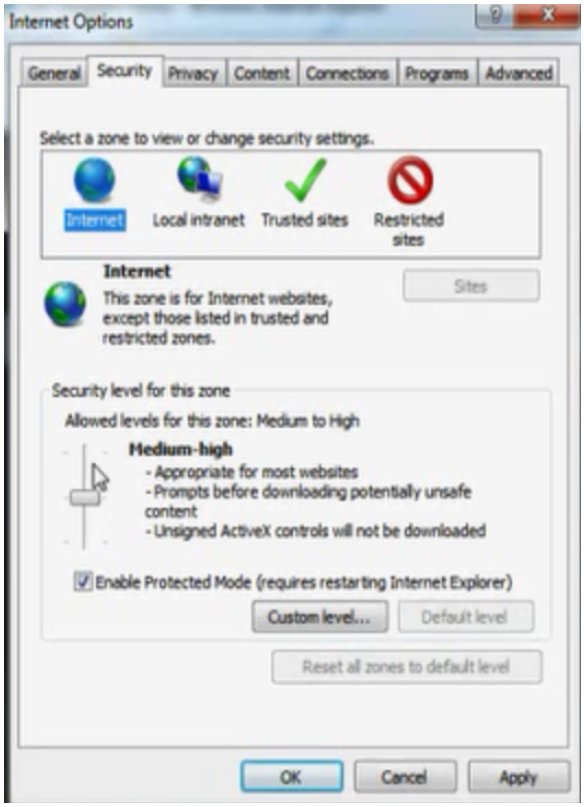
->microsoft sharepoint server



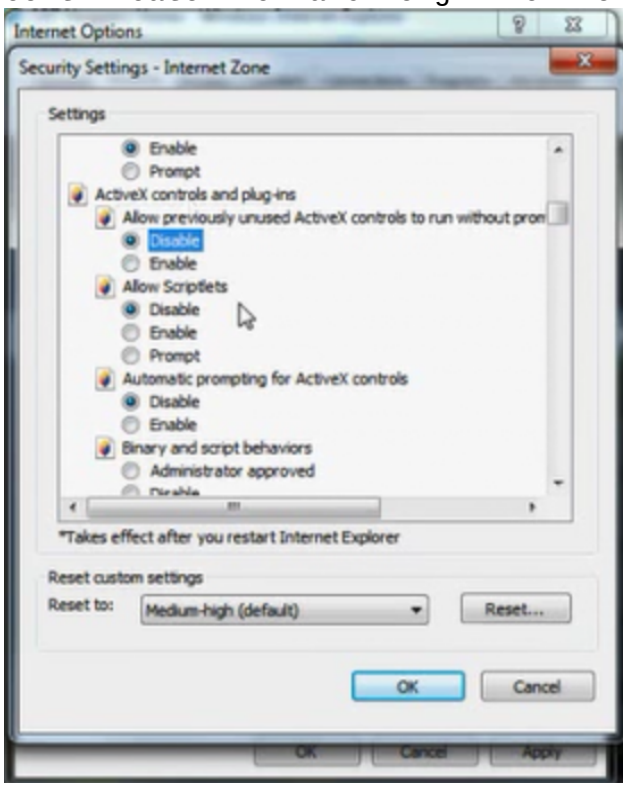
SECURITY ZONES

- CONFIGURE IN BROWSER ✓
- ZONES FOR DIFFERENT LEVELS OF TRUST ✓
- ZONES HAVE PRE-PACKAGED SETTINGS
  - .NET ✓
  - ACTIVEX ✓
  - DOWNLOADS ✓
  - SCRIPTS ✓
  - CAN MODIFY LOCALLY OR CENTRALLY

GPO

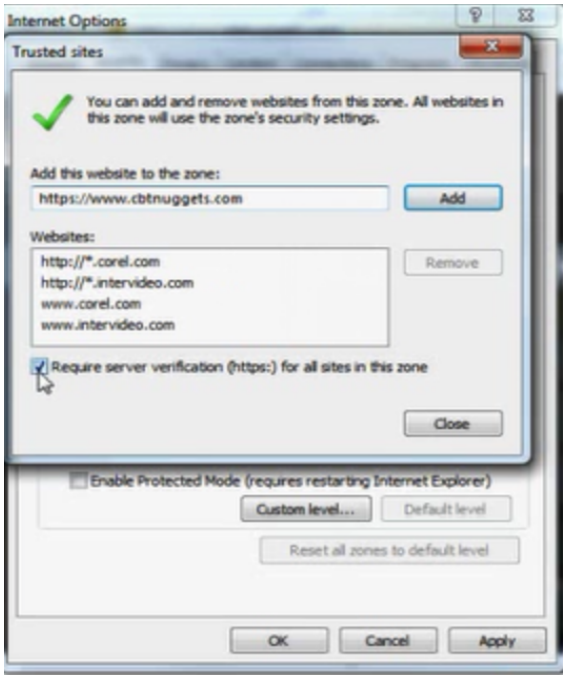


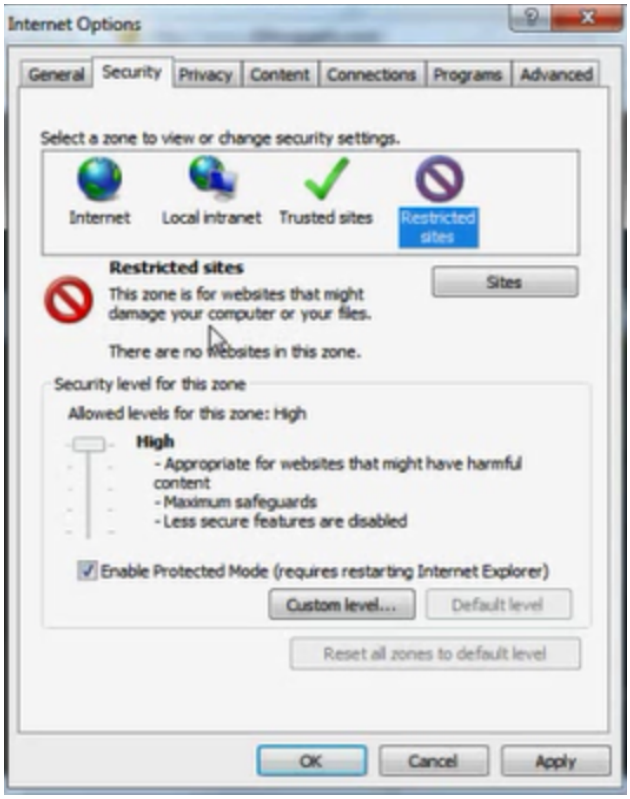
->signed and unsigned activex control (signed requires a certificate from a CA e.g. from veri-sign)

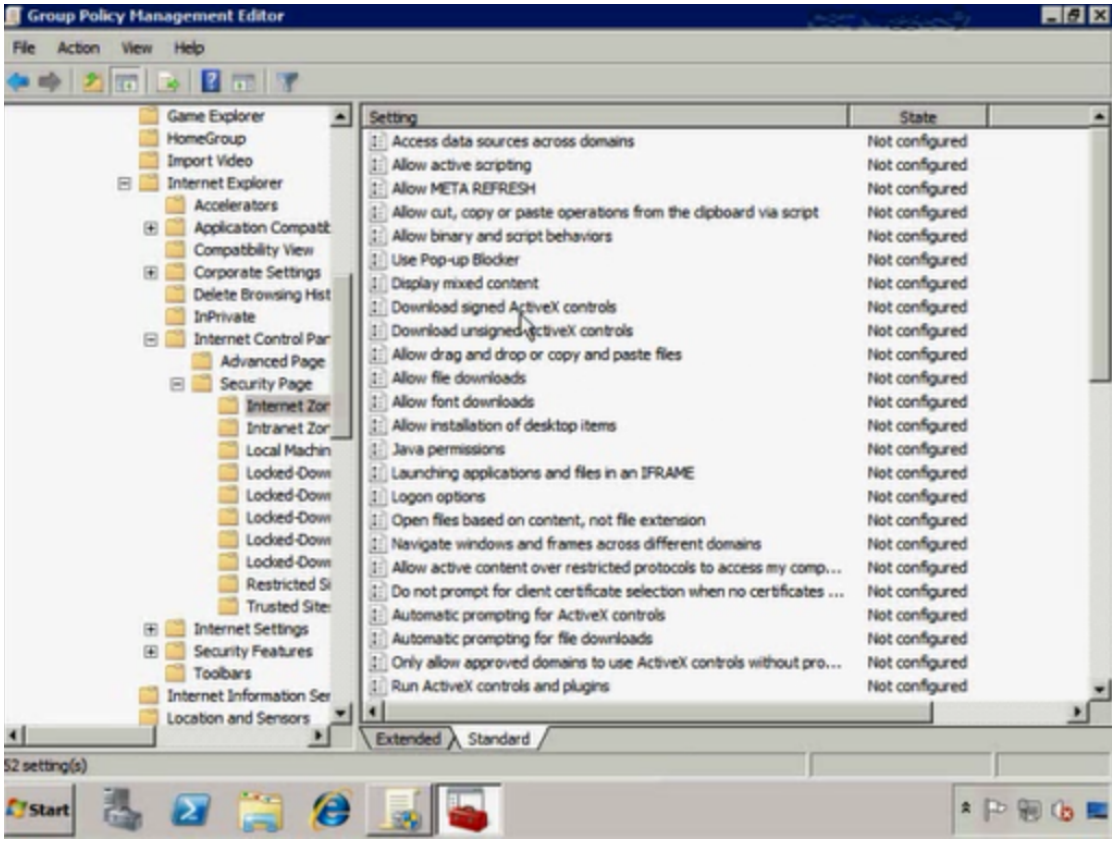


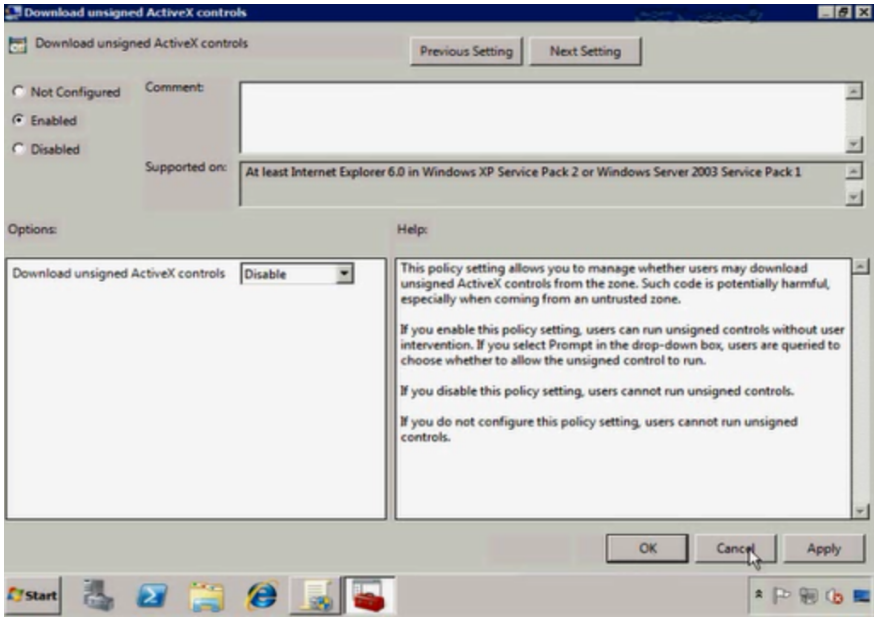

Internet Options
General
Security
Privacy
Content
Connections
Programs
Advanced
Select a zone to view or change security settings.
Internet
Local intranet
Trusted sites
Restricted sites
Local intranet
This zone is for all websites that are found on your intranet.
Sites
Security level for this zone
Allowed levels for this zone: All
Medium-low
- Appropriate for websites on your local network (intranet)
- Most content will be run without prompting you
- Unsigned ActiveX controls will not be downloaded
- Same as Medium level without prompts
Enable Protected Mode (requires restarting Internet Explorer)
Custom level...
Default level
Reset all zones to default level
OK
Cancel
Apply

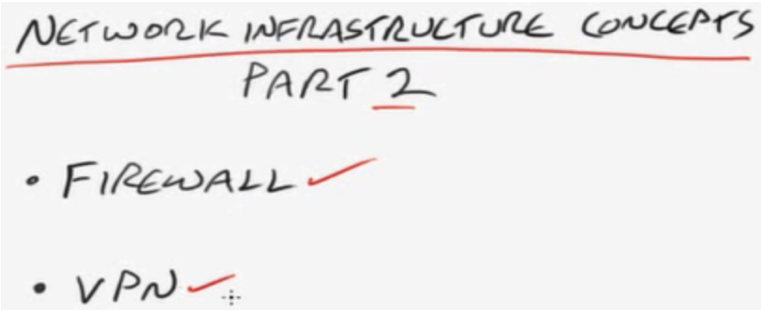

Internet Options
General
Security
Privacy
Content
Connections
Programs
Advanced
Select a zone to view or change security settings.
Internet
Local intranet
Trusted sites
Restricted sites
Trusted sites
This zone contains websites that you trust not to damage your computer or your files.
You have websites in this zone.
Sites
Security level for this zone
Allowed levels for this zone: All
Medium
- Prompts before downloading potentially unsafe content
- Unsigned ActiveX controls will not be downloaded
Enable Protected Mode (requires restarting Internet Explorer)
Custom level...
Default level
Reset all zones to default level
OK
Cancel
Apply

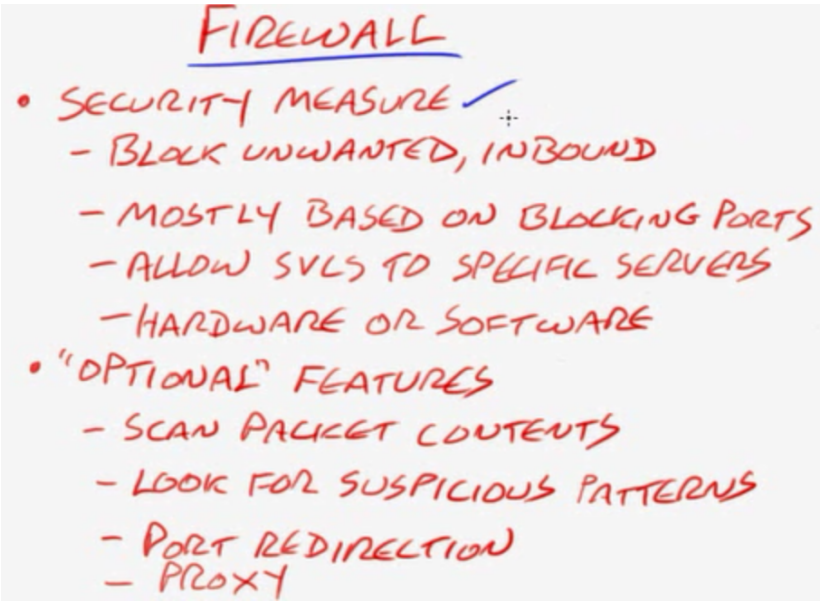

Internet Options
Trusted sites
You can add and remove websites from this zone. All websites in this zone will use the zone's security settings.
Add this website to the zone:
https://www.cbtnuggets.com
Add
Websites:
http://*.corel.com
http://*.intervideo.com
www.corel.com
www.intervideo.com
Remove
Require server verification (https:) for all sites in this zone
Close
Enable Protected Mode (requires restarting Internet Explorer)
Custom level...
Default level
Reset all zones to default level
OK
Cancel
Apply


Internet Options
General
Security
Privacy
Content
Connections
Programs
Advanced
Select a zone to view or change security settings.
Internet
Local intranet
Trusted sites
Restricted sites
Restricted sites
This zone is for websites that might damage your computer or your files.
There are no websites in this zone.
Sites
Security level for this zone
Allowed levels for this zone: High
High
- Appropriate for websites that might have harmful content
- Maximum safeguards
- Less secure features are disabled
Enable Protected Mode (requires restarting Internet Explorer)
Custom level...
Default level
Reset all zones to default level
OK
Cancel
Apply

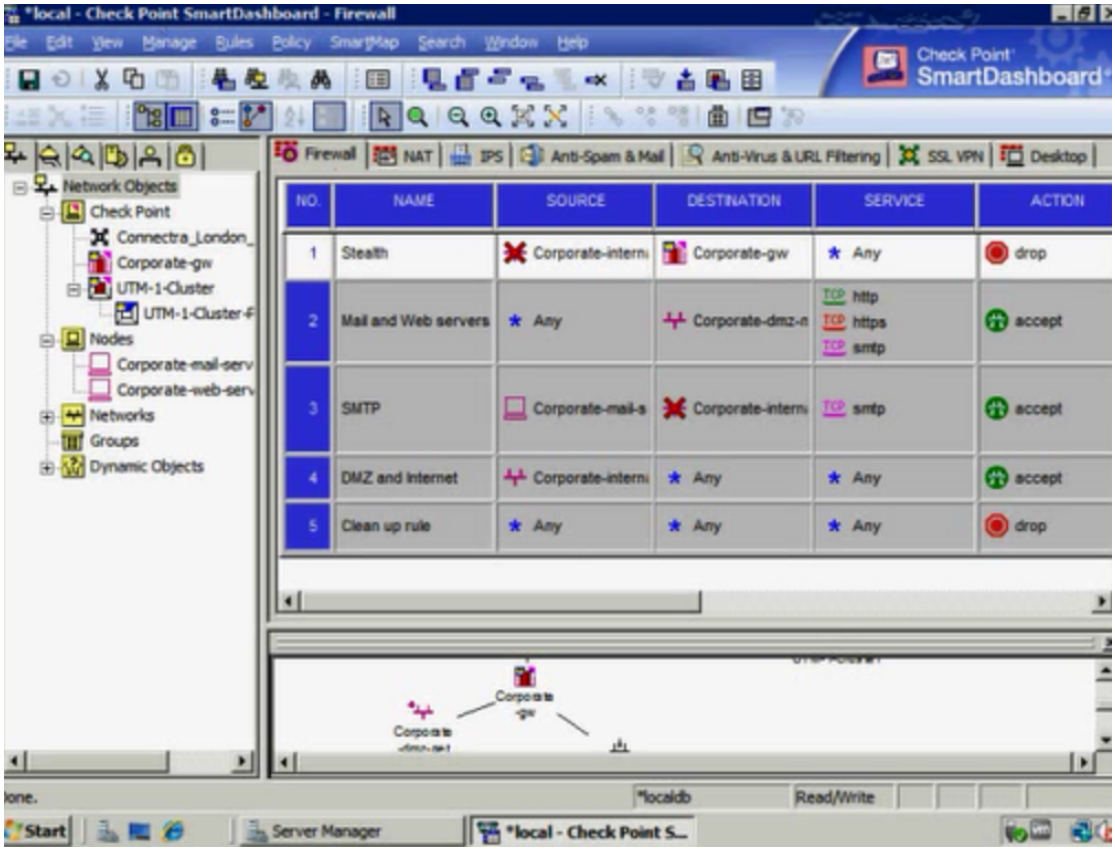

Group Policy Management Editor
File Action View Help
Game Explorer
HomeGroup
Import Video
Internet Explorer
Accelerators
Application Compatib
Compatibility View
Corporate Settings
Delete Browsing Hist
InPrivate
Internet Control Par
Advanced Page
Security Page
Internet Zor
Intranet Zor
Local Machin
Locked-Down
Locked-Down
Locked-Down
Locked-Down
Locked-Down
Restricted Si
Trusted Site
Internet Settings
Security Features
Toolbars
Internet Information Ser
Location and Sensors
Setting
State
Access data sources across domains
Allow active scripting
Allow META REFRESH
Allow cut, copy or paste operations from the clipboard via script
Allow binary and script behaviors
Use Pop-up Blocker
Display mixed content
Download signed ActiveX controls
Download unsigned ActiveX controls
Allow drag and drop or copy and paste files
Allow file downloads
Allow font downloads
Allow installation of desktop items
Java permissions
Launching applications and files in an IFRAME
Logon options
Open files based on content, not file extension
Navigate windows and frames across different domains
Allow active content over restricted protocols to access my comp...
Do not prompt for client certificate selection when no certificates ...
Automatic prompting for ActiveX controls
Automatic prompting for file downloads
Only allow approved domains to use ActiveX controls without pro...
Run ActiveX controls and plugins
Not configured
Extended
Standard
52 setting(s)
Start


Download unsigned ActiveX controls
Download unsigned ActiveX controls
Previous Setting
Next Setting
Not Configured
Enabled
Disabled
Comment:
Supported on:
At least Internet Explorer 6.0 in Windows XP Service Pack 2 or Windows Server 2003 Service Pack 1
Options:
Help:
Download unsigned ActiveX controls
Disable
This policy setting allows you to manage whether users may download unsigned ActiveX controls from the zone. Such code is potentially harmful, especially when coming from an untrusted zone.
If you enable this policy setting, users can run unsigned controls without user intervention. If you select Prompt in the drop-down box, users are queried to choose whether to allow the unsigned control to run.
If you disable this policy setting, users cannot run unsigned controls.
If you do not configure this policy setting, users cannot run unsigned controls.
OK
Cancel
Apply
Start

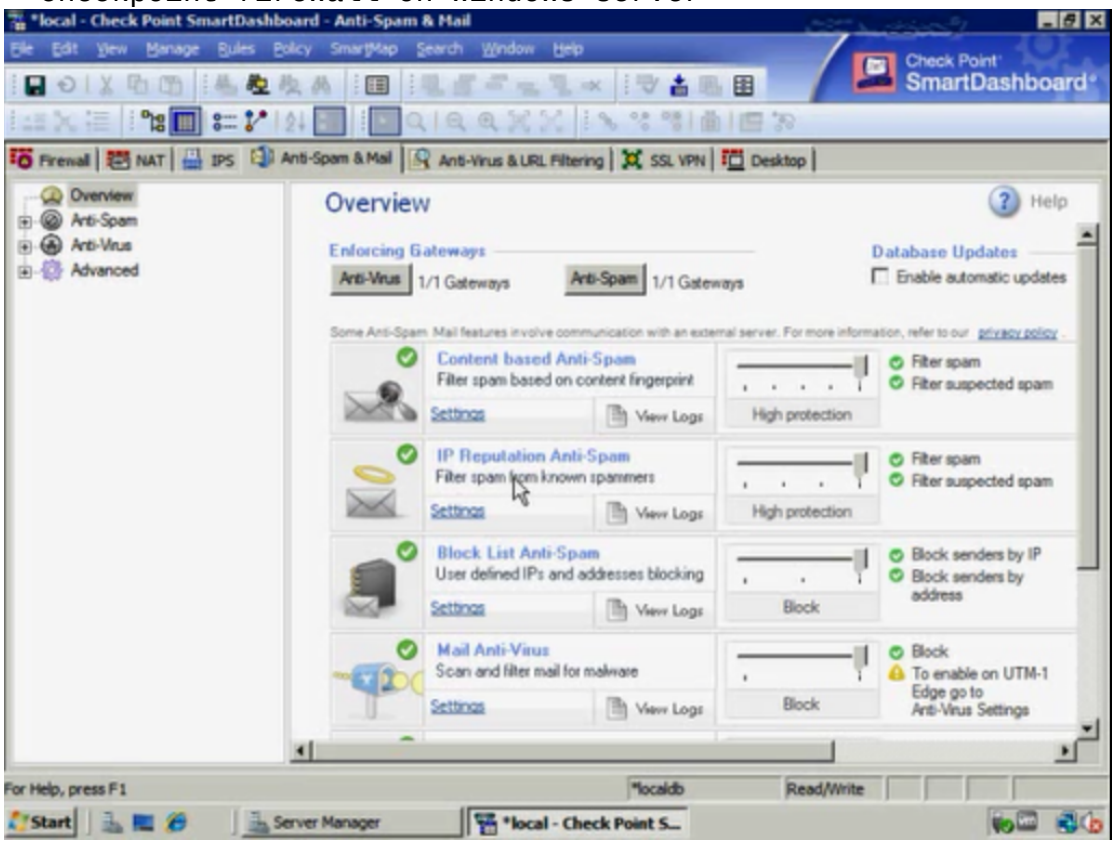

NETWORK INFRASTRUCTURE CONCEPTS
PART 2
• FIREWALL
• VPN



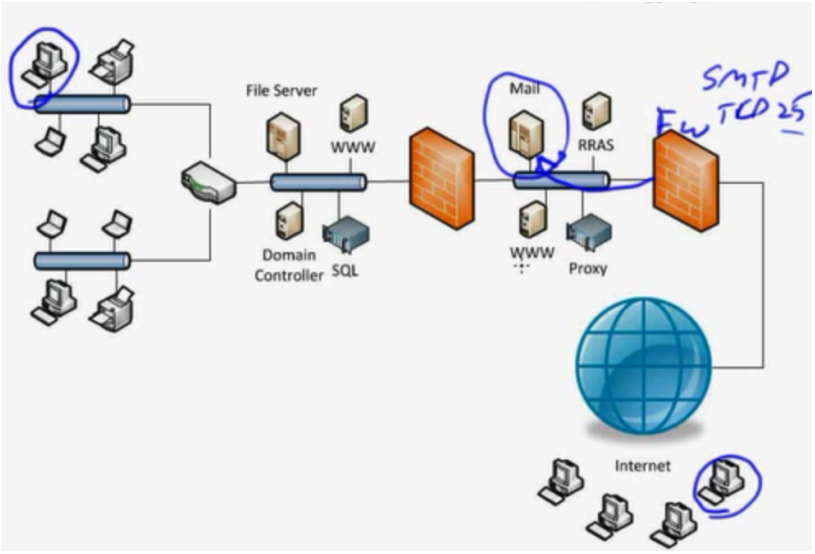
->5500 series ASA

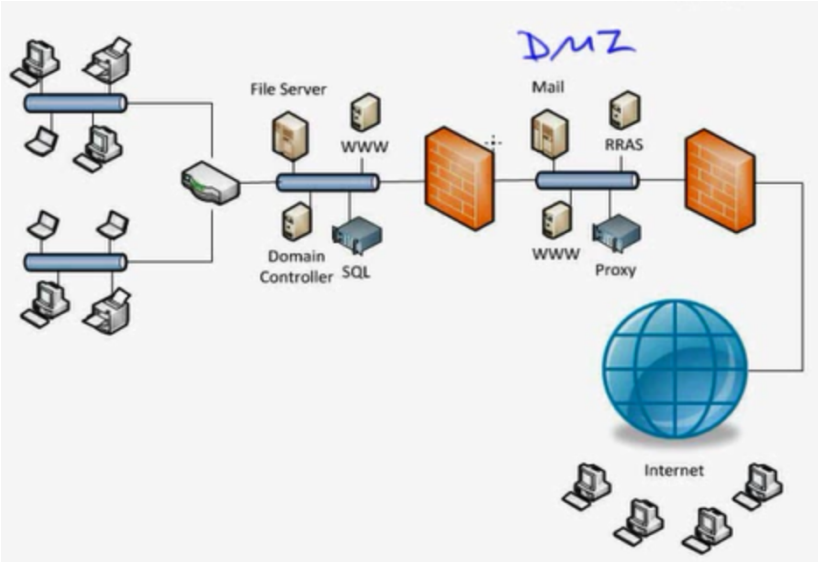


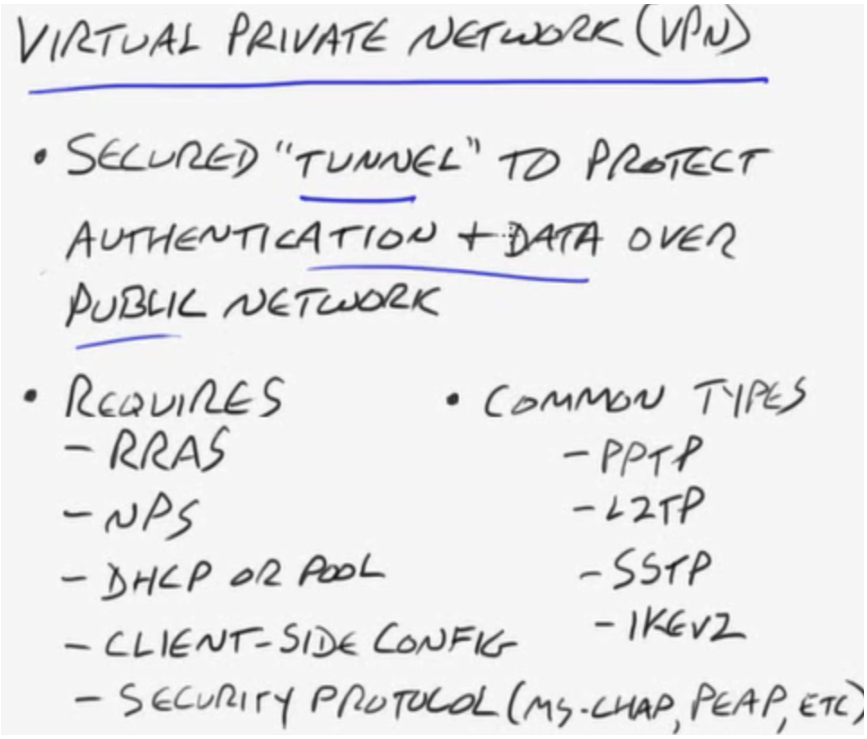
->checkpoint firewall on windows server



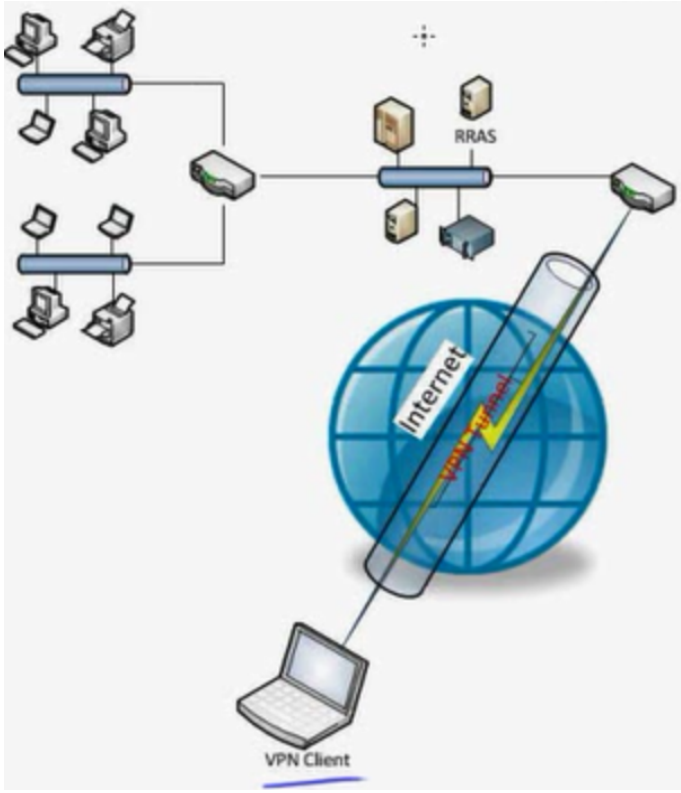
->proxy retrieves the internet traffic for the client (provides benefits of cache and security)

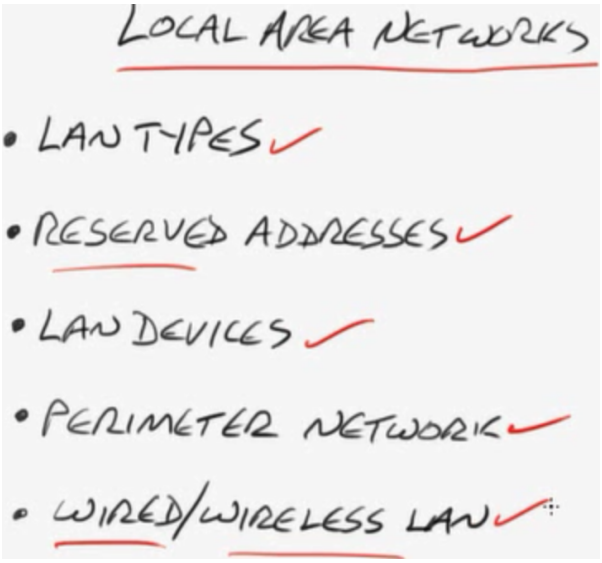

File Server
WWW
Domain Controller
SQL
Mail
RRAS
WWW
Proxy
Internet
SMTP
TCP 25
FW

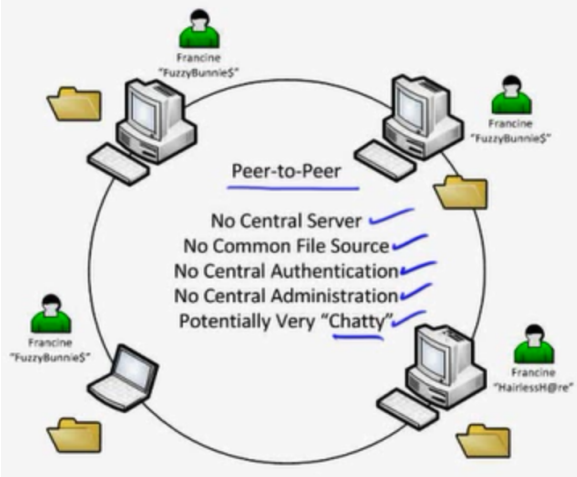

DMZ
File Server
WWW
Domain Controller
SQL
Mail
RRAS
WWW
Proxy
Internet

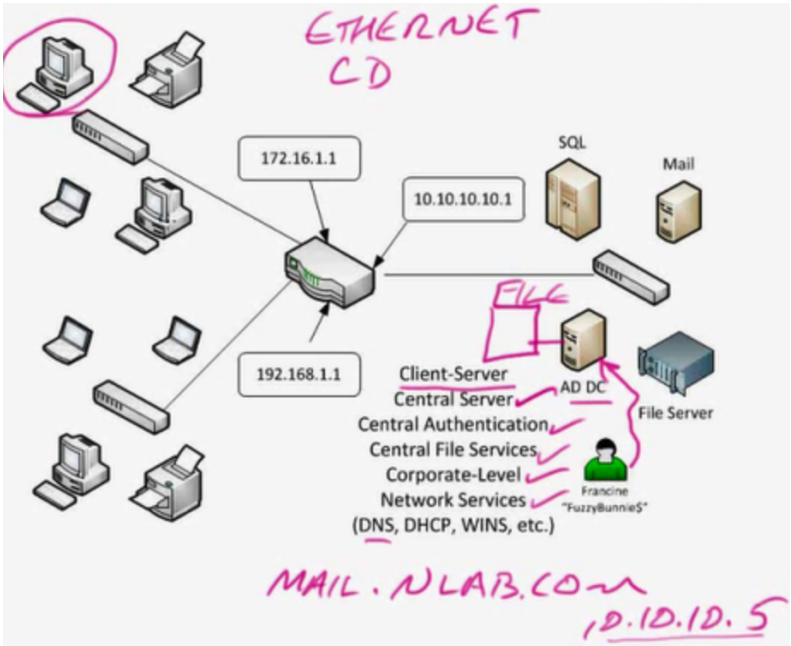


->NPS(Network Policy Server)(security precaution e.g. a remote client is compromised and is using vpn and could spread virus)
->RRAS(Routing Remote Access Server)









->ADS(Active directory domain controller central server)
(username passwords saved on central ADS)
->Central file server(share server)
->Central DNS servers(resolving name into IP address)

->Central DHCP servers(allocating or assigning IP addresses)
->Central Exchange/Mail server
->Central SQL/Database server
->Router segments the networks into different broadcast domains (subnets)
->In an ethernet network every port on the switch is a collision domain

IP Address Classes

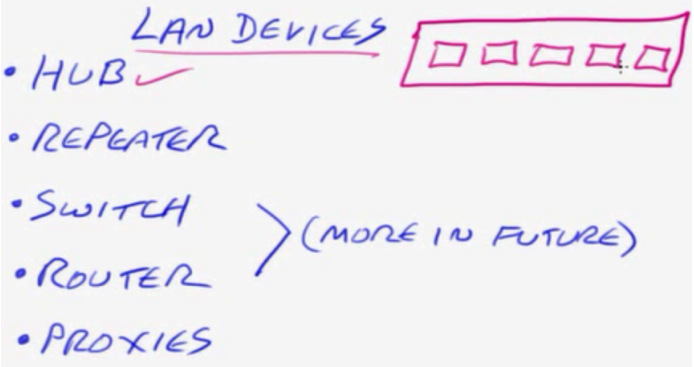
Address Class	Network ID	Default SN Mask	# Networks	# Hosts
Class A	1-126.0.0.0 (0)	255.0.0.0	126	16,777,214
Class B	128-191.0.0.0 (10)	255.255.0.0	16,384	65,534
Class C	192-223.0.0.0 (110)	255.255.255.0	2,097,152	254

Class A Loopback Address: 127.0.0.1

Private IP Addresses

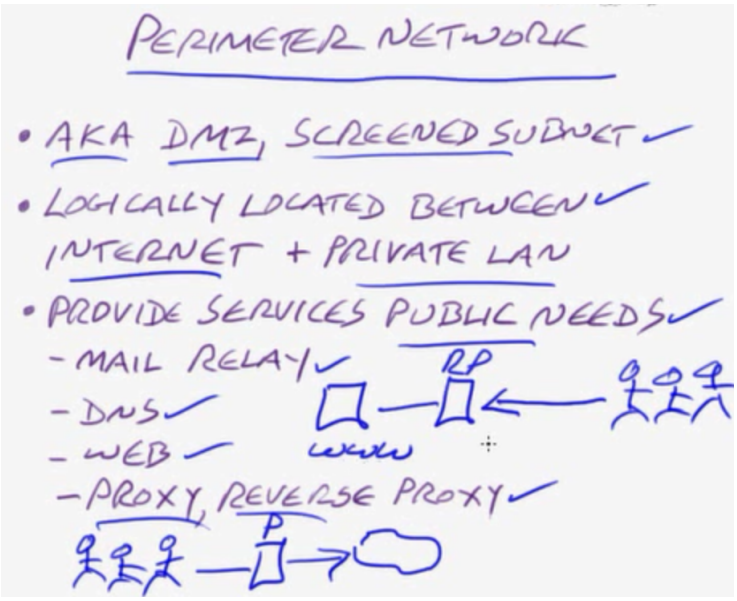
Class A 10.0.0.1 - 10.255.255.254
Class B 172.16.0.1 - 172.31.255.254
Class C 192.168.0.1 - 192.168.255.254

Automatic Private IP Address (APIPA)
Class C 169.254.0.0/24

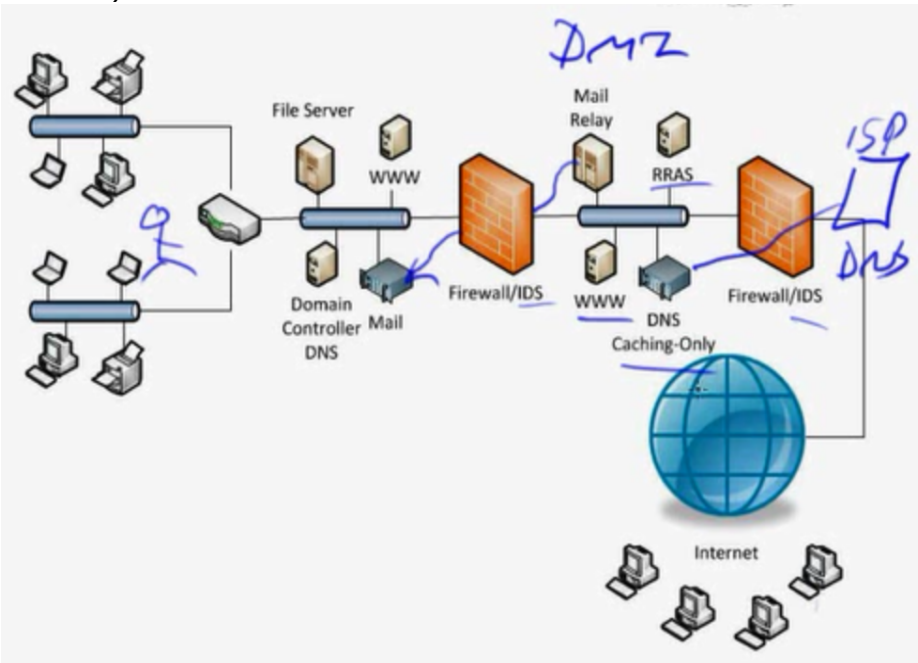


->Repeaters are not used mush anymore as fibre optics cables are used which can run to miles and miles
->Proxy server can act as firewall and caching server

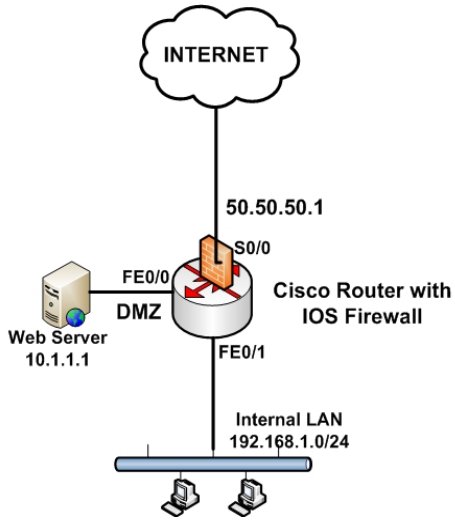
->Redundant power supplies on high end data centre switches like 4500 and 6500 series

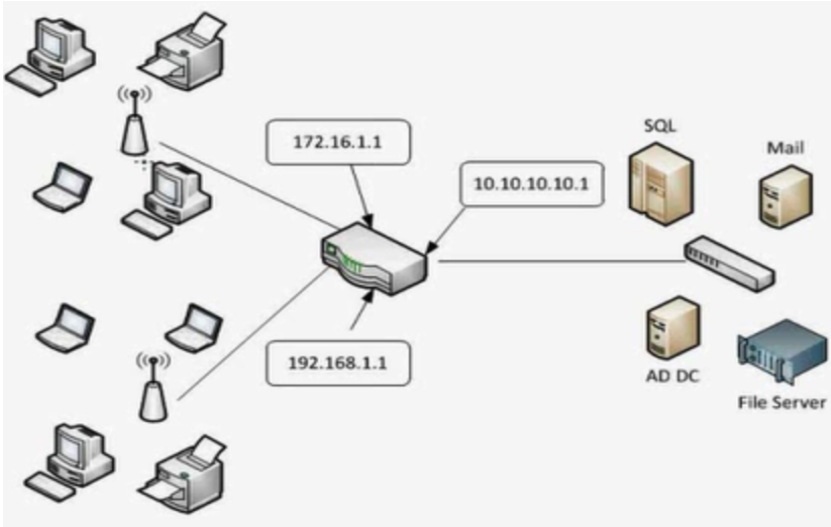


->DMZ(De-Militrized Zone)
->Mail relay (that is a middle server between the internet and the exchange server)
->DNS,Web(IIS/Internet Information Services from microsoft) and Proxy are also in DMZ
->Proxy(microsoft ISA=Internet Security and Acceleration Server)

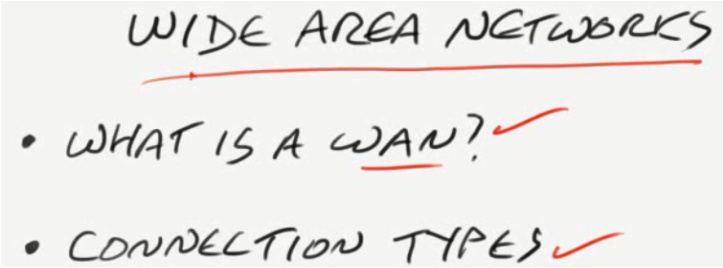


->DMZ Server=Mail Relay, RRAS, WWW and DNS Cache only
->Internal Servers=WWW, File Server, DC(DNS) and Exchange



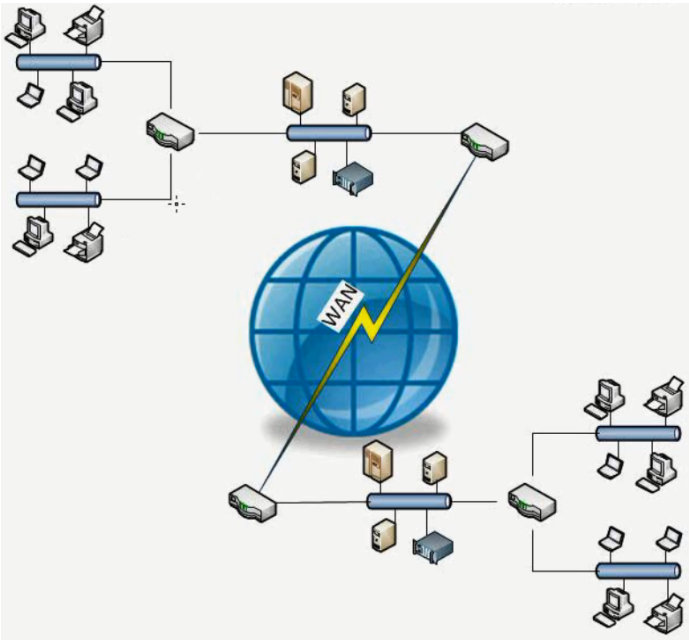


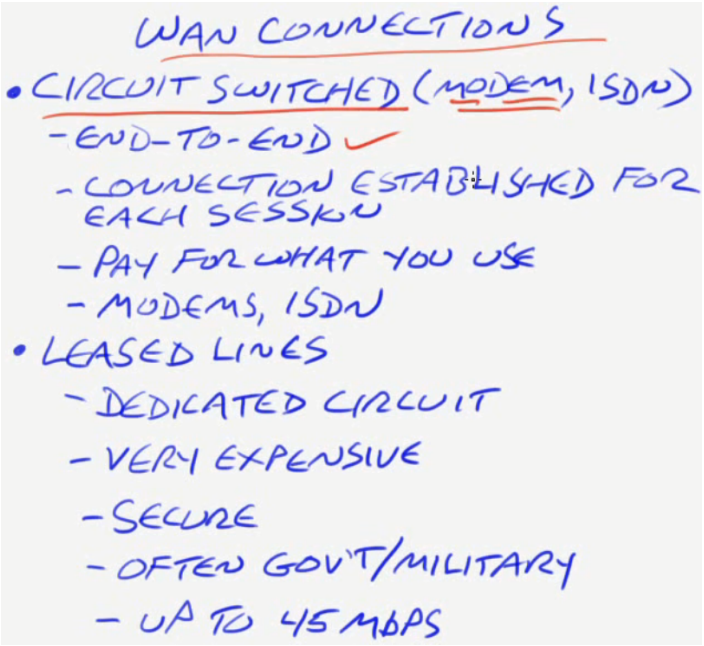
->WAP(Wireless Access Point) connects wired to PoE switches

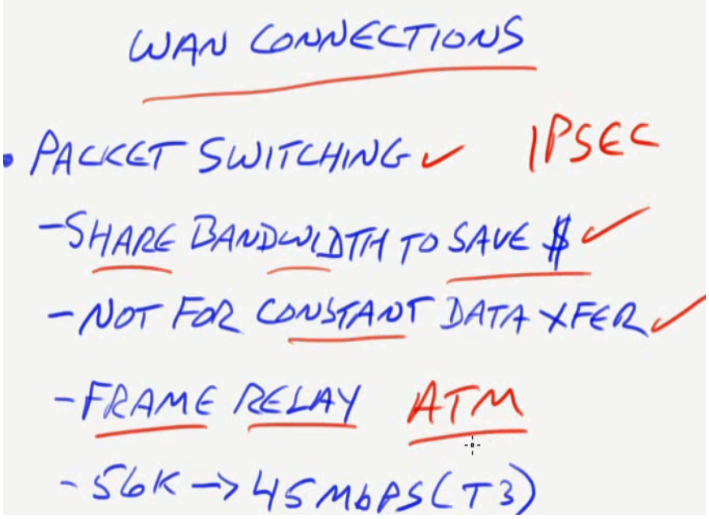


WHAT IS A WAN?

- SEPARATE LANS CONNECTED OVER WIDE GEOGRAPHIC AREA
  - CAMPUSES, BRANCH, BUSINESS PARTNER
- CONNECTED BY CARRIERS
- CLOSER CONNECTIONS (e.g., CAMPUS)
  - FDDI RING
- FARTHER CONNECTIONS
  - T1, E1, T3, E3, ATM...







->FR, ATM, MPLS, Cable, DSL etc.
->Leased line connection speeds these days are more than listed here updates are in Netwrok+ exam

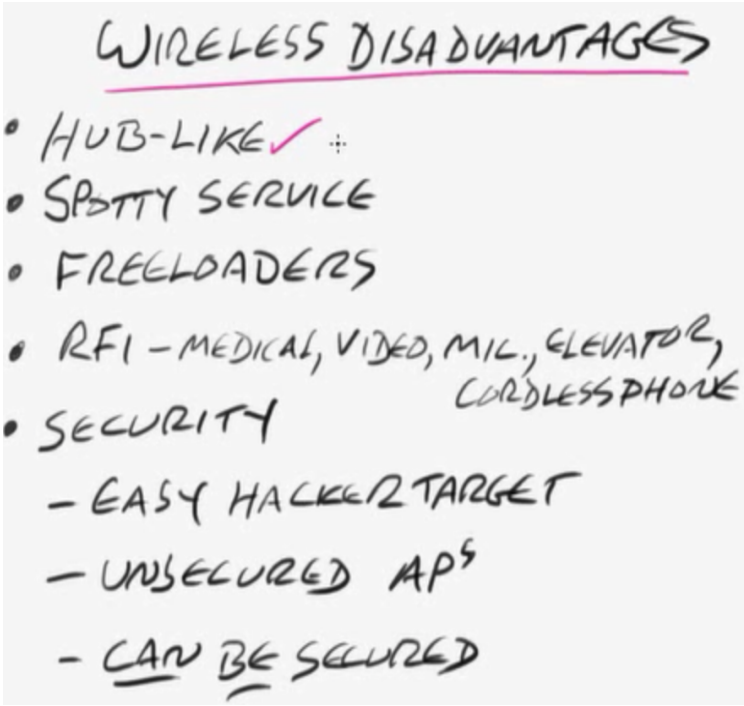
Connection Type	Speed	Availability	Notes
Leased Line	Up to 45 Mbps	Constant	• Constantly available • Pre-established point-to-point connection • Very secure – not a shared connection • Most expensive solution
Dial-up Modem	Up to 53K	Connection must be established for each session	• Circuit switched • Very inexpensive • Slowest connection type • Modem modulates/demodulates between analog and digital • No longer practical in most situations
ISDN Basic Rate Interface (BRI)	128 Kbps – 2 Mbps	Connection must be established for each session, however it occurs much faster than dial-up modem	• Connection over POTS copper pair • Digital throughout • Two Bearer channel (B channel) for data • One Delta channel (D channel) for call setup & link management • Supports simultaneous voice/data
ISDN Primary Rate Interface (PRI)	Up to 1.54 Mbps	Connection must be established for each session, however it occurs much faster than dial-up modem	• Same as BRI plus, • 23 64Kbps B channels
Virtual Private Network (VPN)	Dependent on speed of Internet connection	Connection must be established for each session	• Little, if any, additional expense • Uses existing networking from Internet to accept VPN client connections
T1	1.544 Mbps	Constant	• A type of leased line • United States, South Korea, Japan (called a J1 in Japan) • 24 64 Kbps digitized voice channels • Useful for voice/data • Can use fractional T line for a reduced cost
T3	44.736 Mbps	Constant	• Same as T1 • 672 64Kbps digitized voice channels • Usually delivered over fiber (not copper)
E1	2.048 Mbps	Constant	• A type of leased line • European version of T1 • 30 64 Kbps digitized voice channels
E3	34.368 Mbps	Constant	• Same as E1 • European version of T3 • 512 64Kbps digitized voice channels • Japan uses the J3 at 32.064 Mbps
OC-1	51.84 Mbps	Constant	• Uses Synchronous Optical Network (SONET) in US • Uses Synchronous Digital Hierarchy (SDH) internationally
OC-3	155.52 Mbps		
OC-12	622.08 Mbps		
OC-48	2.488 Gbps		
OC-192	9.953 Gbps		
Digital Subscriber Line (DSL)	25 Kbps - 100 Mbps (varies greatly depending on implementation)	Connection must be established for each session, however it occurs much faster than dial-up modem	• Last mile connection method to connect to telco central office (CO) • Various implementations collectively referred to as "xDSL" • High speed corporate use is VDSL • Consumer level is ADSL
Cable Modem	Up to 20 Mbps +	Constant	• Asynchronous in most SOHO • Synchronous often available to business • Very cost effective • Preferred for many SOHO • VERY shared connection • Possible backup link
Asynchronous Transfer	1.5 – 155 Mbps	Uses virtual connection	• 53-byte cells
Fiber optics (FTTC)	30-75Mbps +	constant	alternate to ADSL2

WIRELESS NETWORKING

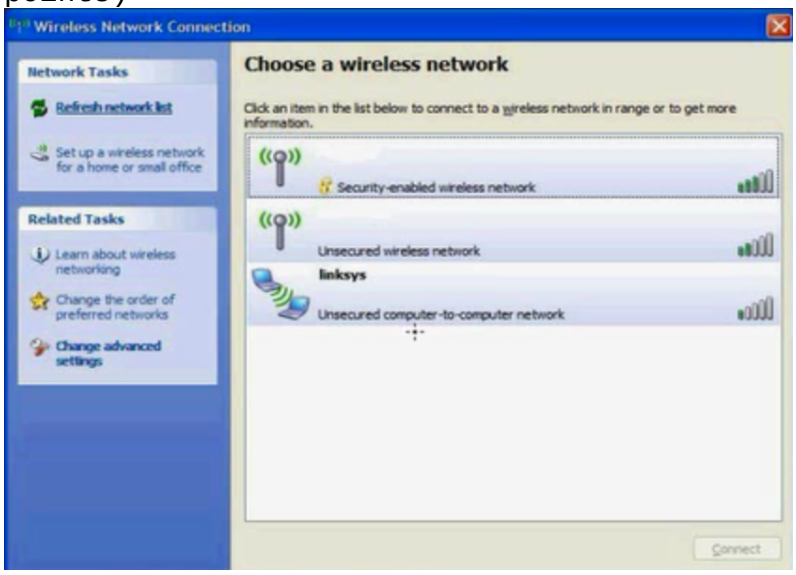
- WIRELESS ADVANTAGES
- WIRELESS DISADVANTAGES
- SECURING WIRELESS
- WIRELESS CHANNELS
- WIRELESS TOPOLOGY

WIRELESS ADVANTAGES

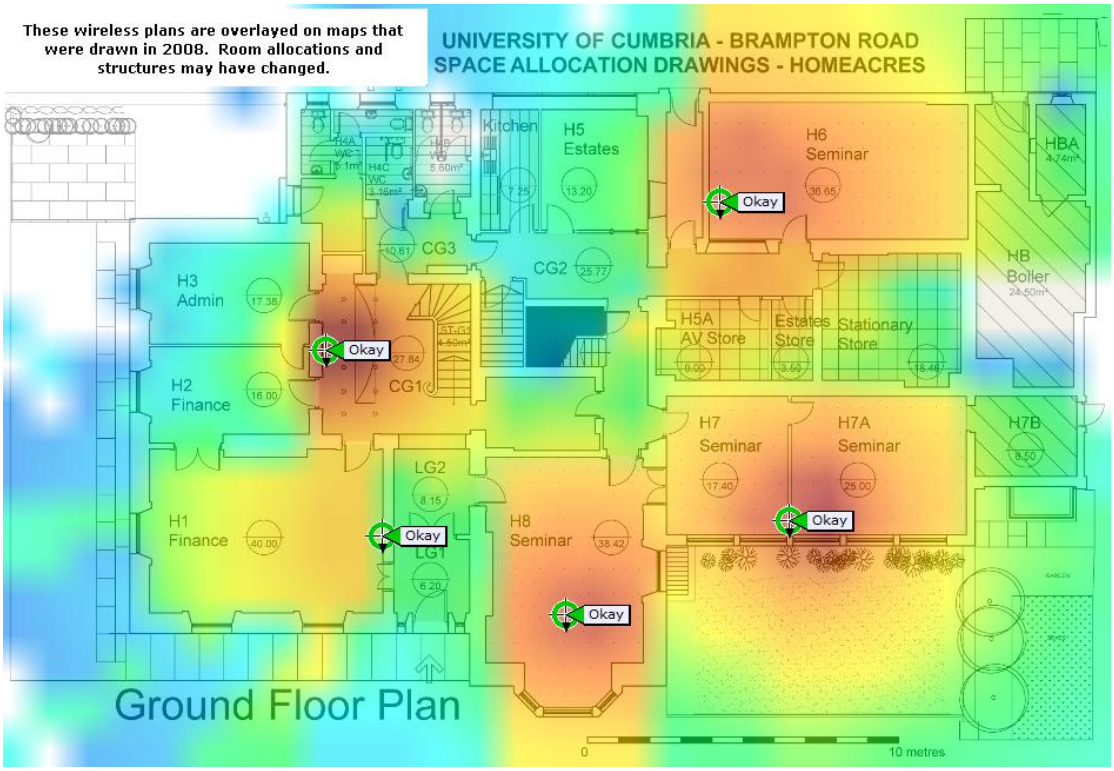
- IT'S UH, WIRELESS
  - REMODELING TO RUN WIRES
  - TEMPORARY NETWORK
  - BLDG CODES (e.g., HISTORICAL)
  - MOBILITY IN OFFICE, TRAVEL
  - TRIP HAZARD



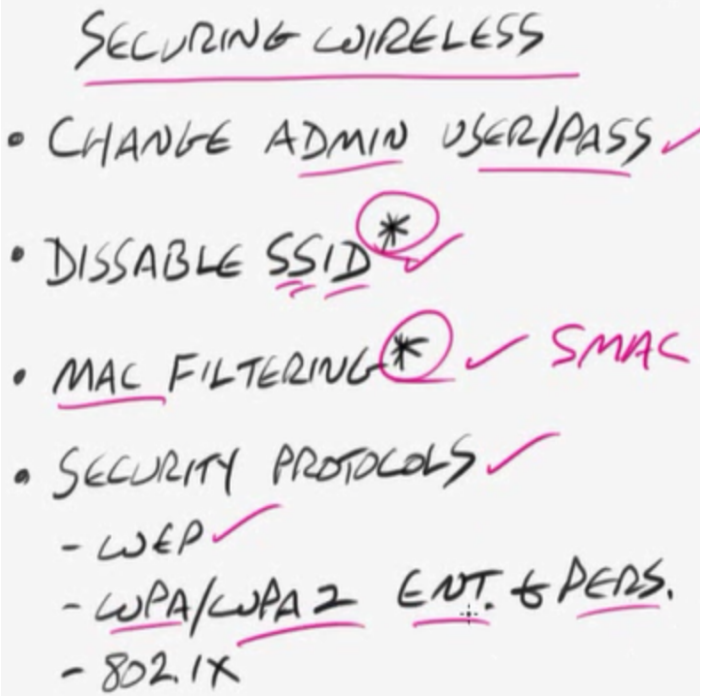
->cordless phone uses 2.5Ghz frequency range too.
->wwar driving (driving aroung looking for unsecure access points)



->unsecured adhoc computer to computer network means you can access someone's shared files and folders



->unvicersity campus wireless/wifi map

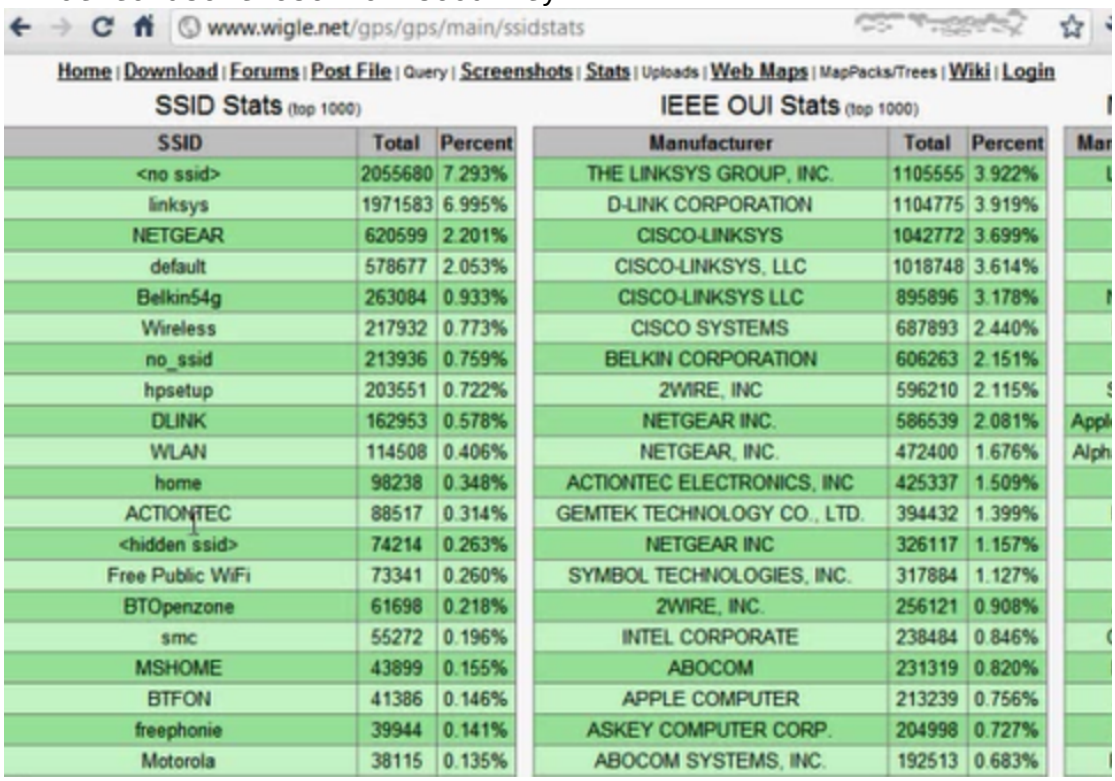


->default APs username and passwords

www.phenoelit-us.org/dpl/dpl.html

Lantronix	ETS32PR		Multi	n/a	(none)
Lantronix	ETS422PR		Multi	n/a	(none)
latis network	border guard		Multi	n/a	(none)
Linksys	WAP11		Multi	n/a	(none)
Linksys	DSL		Telnet	n/a	admin
Linksys	EtherFast Cable/DSL ROuter		Multi	Administrator	admin
Linksys	Linksys Router DSL/Cable		HTTP	(none)	admin
Linksys	BEFW11S4	1	HTTP	admin	(none)
Linksys	BEFSR41	2	HTTP	(none)	admin
Linksys	WRT54G		HTTP	admin	admin
Linksys	WAG54G		HTTP	admin	admin
linksys	ap 1120		Multi	n/a	(none)
Linksys	Linksys DSL			n/a	admin
Livingston	IRX Router		Telnet	!root	(none)
Livingston	Livingston Portmaster 3		Telnet	!root	(none)
Livingston	Officerouter		Telnet	!root	(none)
Livingstone	Portmaster 2R		Telnet	root	(none)
Lockdown Networks	All Lockdown Products	up to 2.7	Console	setup	changeme(excl
longshine	isscfg		HTTP	admin	0
Lucent	B-STDX9000		Multi	(any 3 characters)	cascade
Lucent	B-STDX9000		debug mode	n/a	cascade
Lucent	B-STDX9000	all	SNMP	n/a	cascade
Lucent	CBX 500		Multi	(any 3 characters)	cascade
Lucent	CBX 500		debug mode	n/a	cascade
Lucent	GX 550		SNMP readwrite	n/a	cascade

->SSID(Security Set Identifier)
(commonly used SSID names)
->not to use these for security

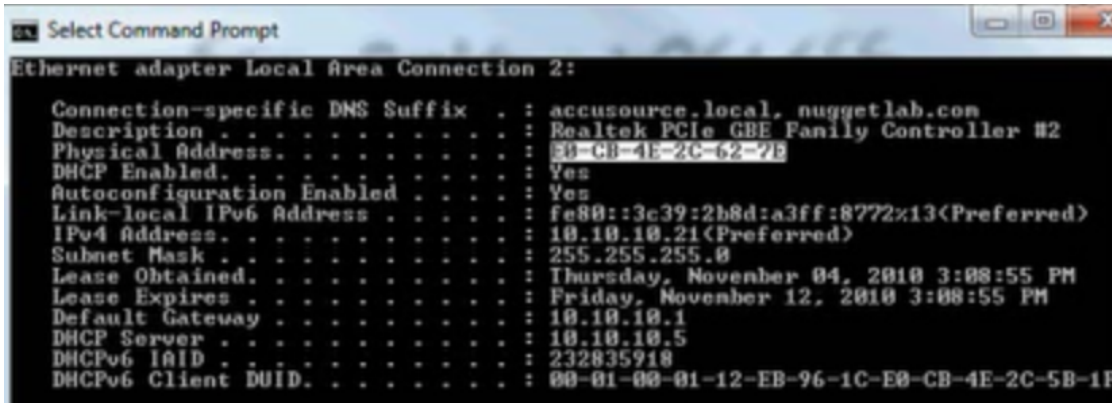


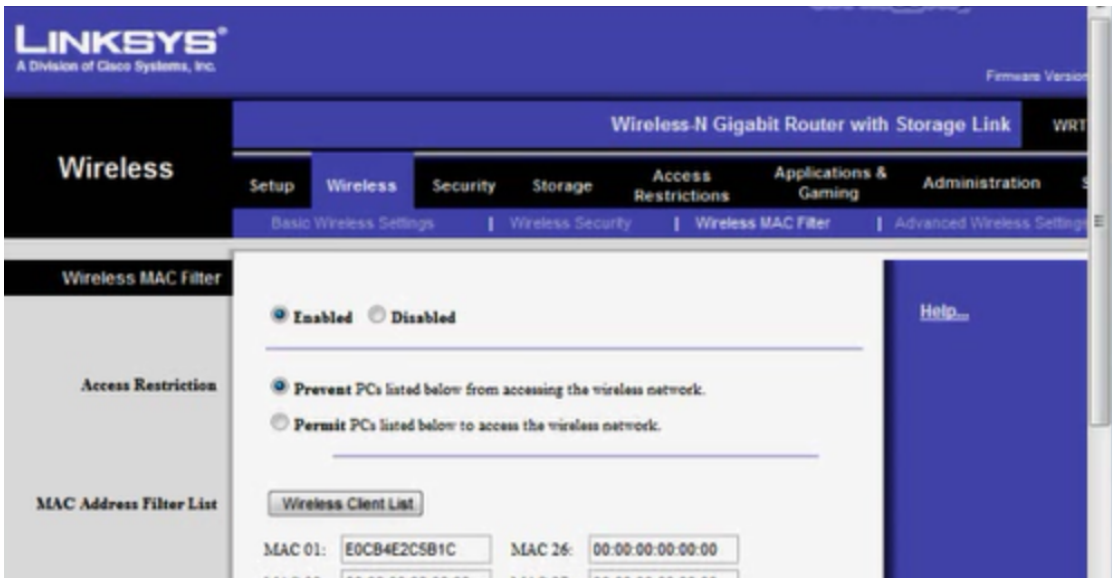
SSID Stats (top 1000)

SSID	Total	Percent
<no ssid>	2055680	7.293%
linksys	1971583	6.995%
NETGEAR	620599	2.201%
default	578677	2.053%
Belkin54g	263084	0.933%
Wireless	217932	0.773%
no_ssid	213936	0.759%
hpsetup	203551	0.722%
DLINK	162953	0.578%
WLAN	114508	0.406%
home	98238	0.348%
ACTIONTEC	88517	0.314%
<hidden ssid>	74214	0.263%
Free Public WiFi	73341	0.260%
BTOpenzone	61698	0.218%
smc	55272	0.196%
MSHOME	43899	0.155%
BTFON	41386	0.146%
freephonie	39944	0.141%
Motorola	38115	0.135%

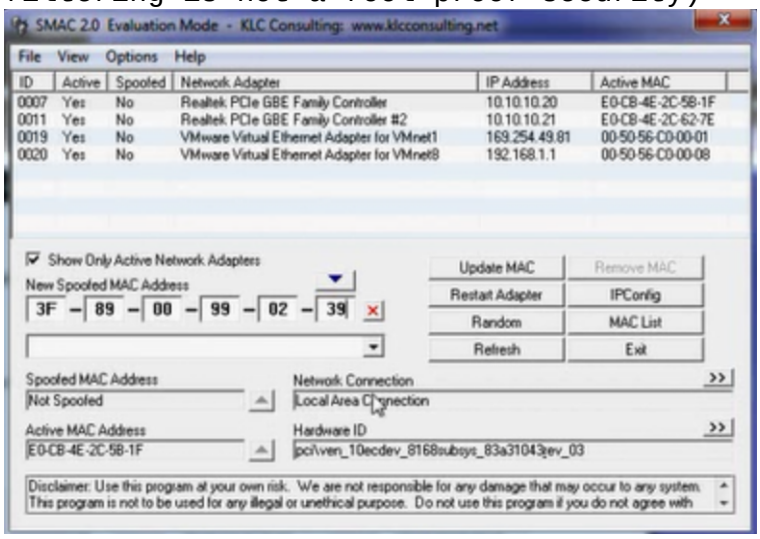
IEEE OUI Stats (top 1000)

Manufacturer	Total	Percent
THE LINKSYS GROUP, INC.	1105555	3.922%
D-LINK CORPORATION	1104775	3.919%
CISCO-LINKSYS	1042772	3.699%
CISCO-LINKSYS, LLC	1018748	3.614%
CISCO-LINKSYS LLC	895896	3.178%
CISCO SYSTEMS	687893	2.440%
BELKIN CORPORATION	606263	2.151%
2WIRE, INC	596210	2.115%
NETGEAR INC.	586539	2.081%
NETGEAR, INC.	472400	1.676%
ACTIONTEC ELECTRONICS, INC	425337	1.509%
GEMTEK TECHNOLOGY CO., LTD.	394432	1.399%
NETGEAR INC	326117	1.157%
SYMBOL TECHNOLOGIES, INC.	317884	1.127%
2WIRE, INC.	256121	0.908%
INTEL CORPORATE	238484	0.846%
ABOCOM	231319	0.820%
APPLE COMPUTER	213239	0.756%
ASKEY COMPUTER CORP.	204998	0.727%
ABOCOM SYSTEMS, INC.	192513	0.683%





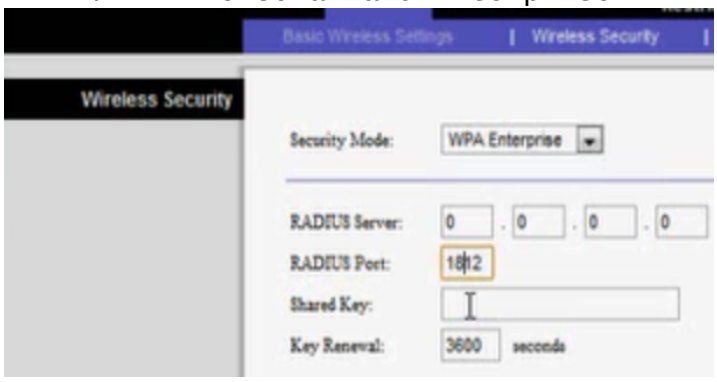
->SMAC (can spoof or fake a MAC address so using MAC filtering is not a fool proof security)

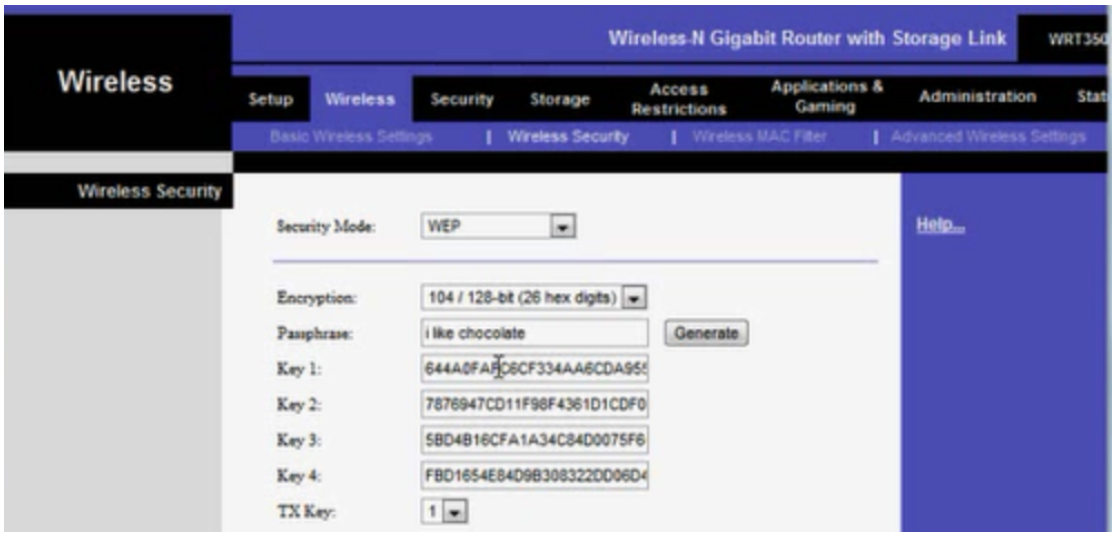


Wireless Security

Protocol	Wired Equivalent Privacy (WEP)	802.1x	Wi-Fi Protected Access (WPA)	WPA2 AKA 802.11i
Security Method	• 64-bit or 128 bit pre-shared key. • First 24-bits is an initialization vector, hence remaining 40 bit or 104 bits are actual key length • PSK directly encrypts wireless traffic	• Extensible authentication protocol (EAP) • Port based authentication (useful for Ethernet or wireless) • Dynamic keys	• Pre-shared Key • Wireless traffic is encrypted by changing keys • Uses Temporal Key Integrity Protocol (TKIP)	• Personal uses a pre-shared Key • Enterprise uses a server (RADIUS) • Wireless traffic is encrypted by changing keys • Uses TKIP or Advanced Encryption Standard (AES)
Notes	• Considered insecure. Various hacker tools can quickly crack wireless traffic to obtain the PSK. • Static, unchanging key • Not scalable	• Considered secure • Extensible allows a variety of authentication methods (MS-CHAP v2, certificates, etc.) • Can use RADIUS	• Strong user authentication available	• Most secure solution • Excellent authentication mechanisms • Dynamic key management

->EAP(Extensible authentication protocol) uses different sort of authentication methods (e.g. MSCHAP, certificates etc.)
->RADIUS(Remote Access Dial-in User Server) (RADIUS server forwards the request to Active Directory to authenticate the users and computers)
->WPA(Wifi protected access uses TKIP)
->WPA2(aka 802.11i) uses both TKIP and AES or RADIUS or preshared key
->WPA/WPA2 Personal and Enterprise



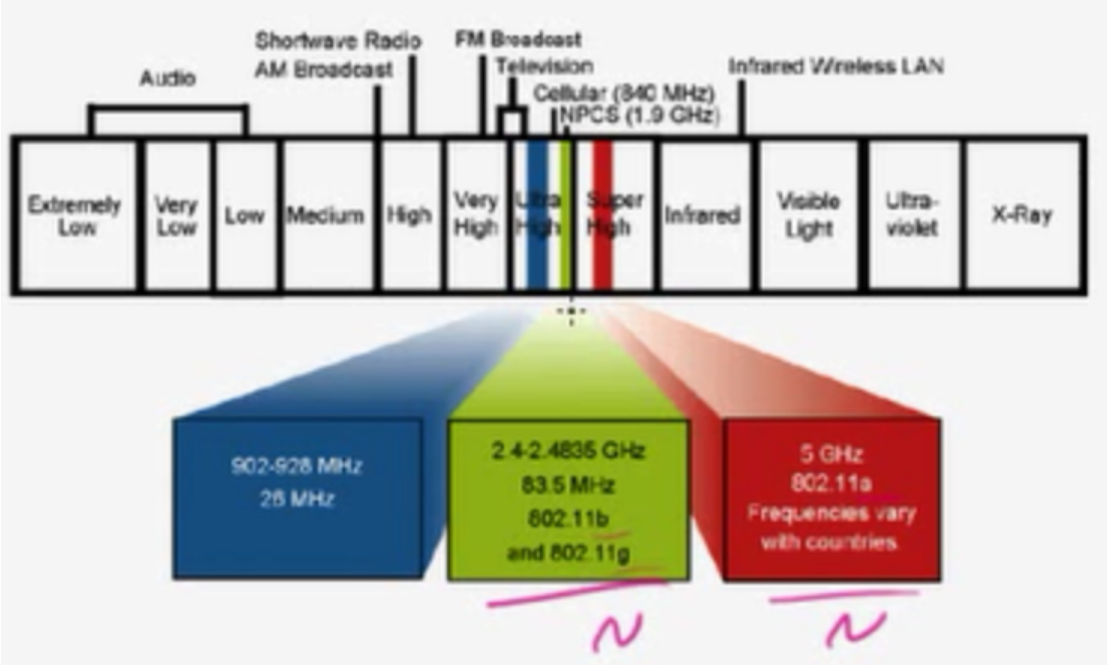


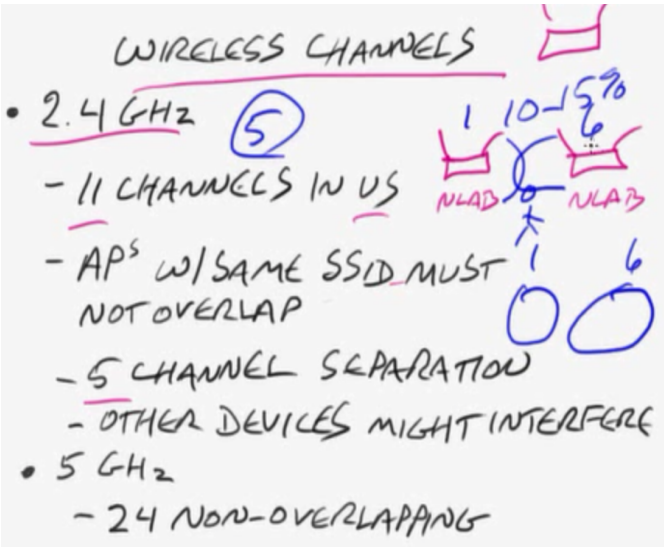
->you can use any one of these keys on the client

->someone can get the key and use a craker software to decrypt the key using brute force attack

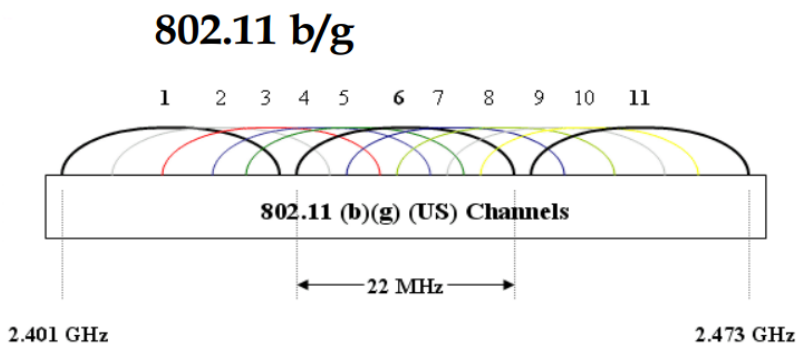
Wireless Networking

Wireless Type	Radio Frequency	Range	Max Bandwidth (Mbps)
802.11a	5 GHz	50m	54
802.11b	2.4 GHz	100m	11
802.11g	2.4 GHz	100m	11 (802.11 b compatibility 54 (pure 802.11g)
802.11n	2.4 GHz, 5 GHz	100m	108-250 (MIMO)

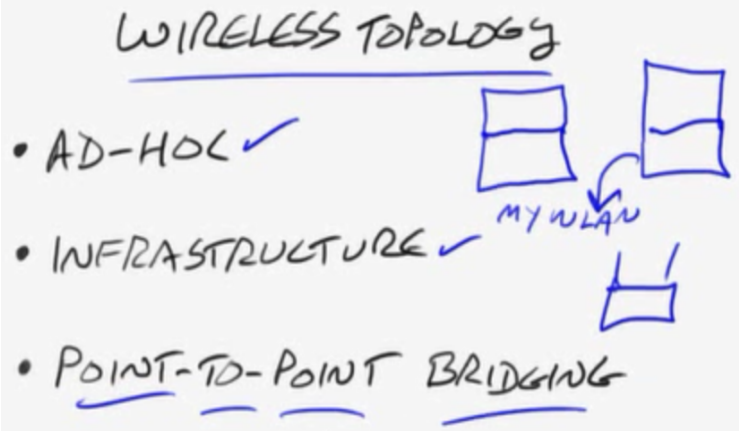




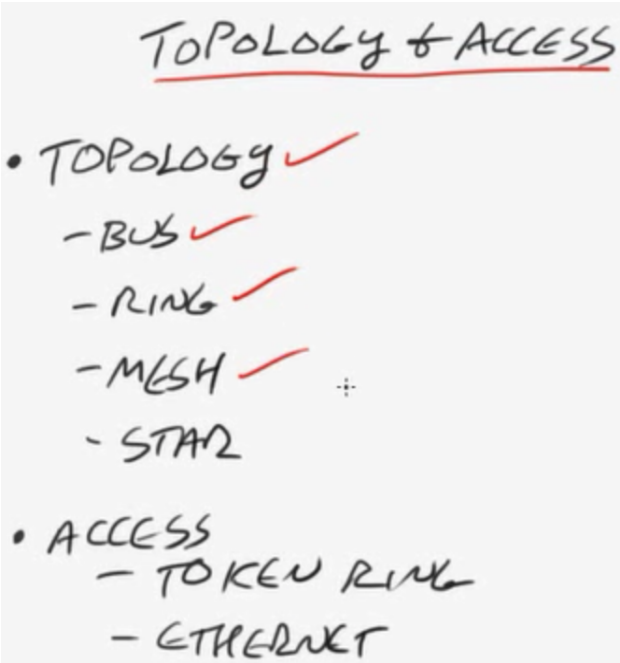
->13 wireless channels in UK and Europe

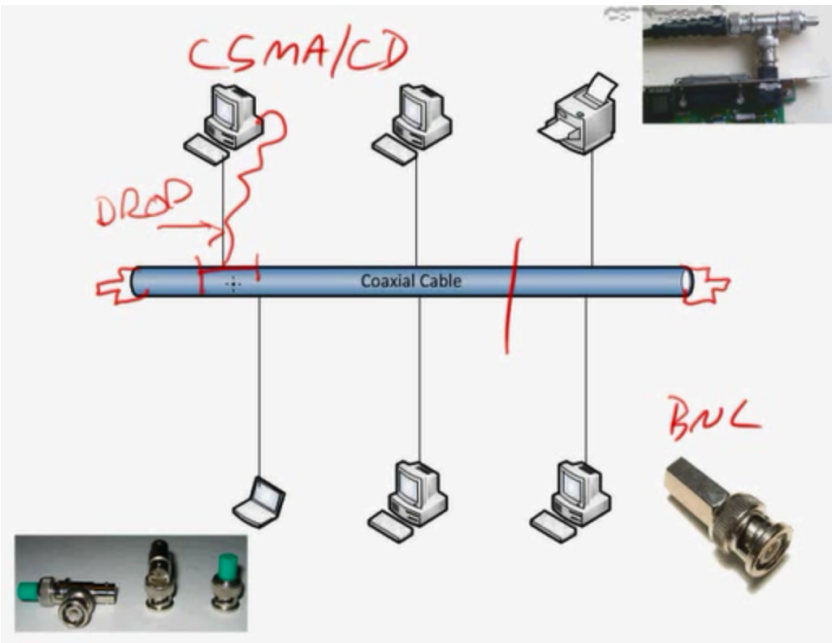


->in 5Ghz range there are already 24 non-overlapping channels

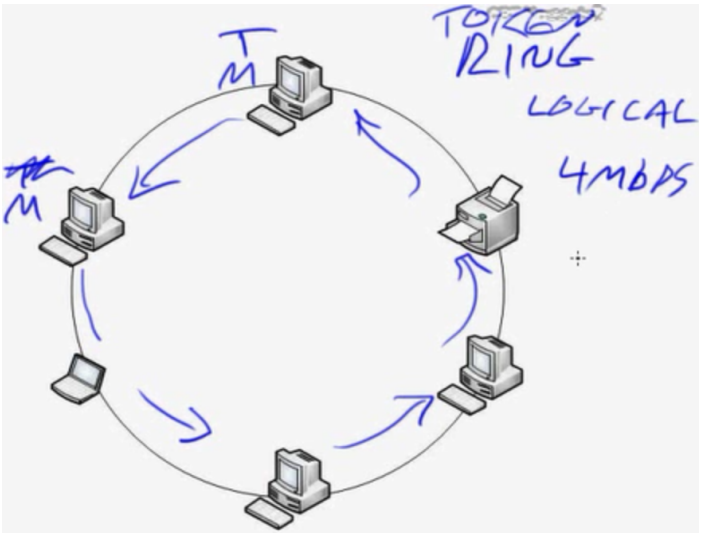


->Ad-Hoc network is computer to computer whereas infrastructure network you use APs
->Wireless Point to Point (wireless Bridging) is wireless connection between buildings
(Motorolla wireless bridges)

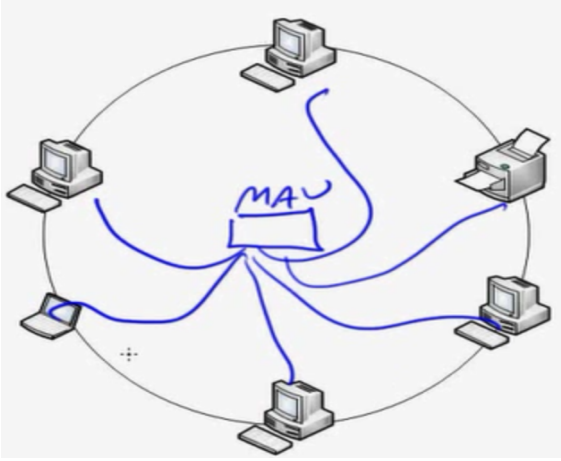




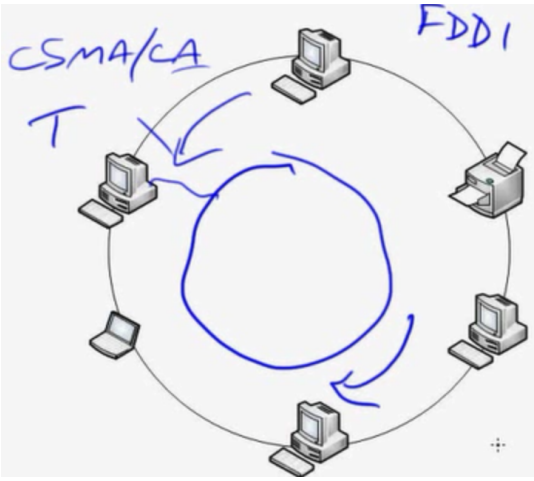
->thicknet coax cable

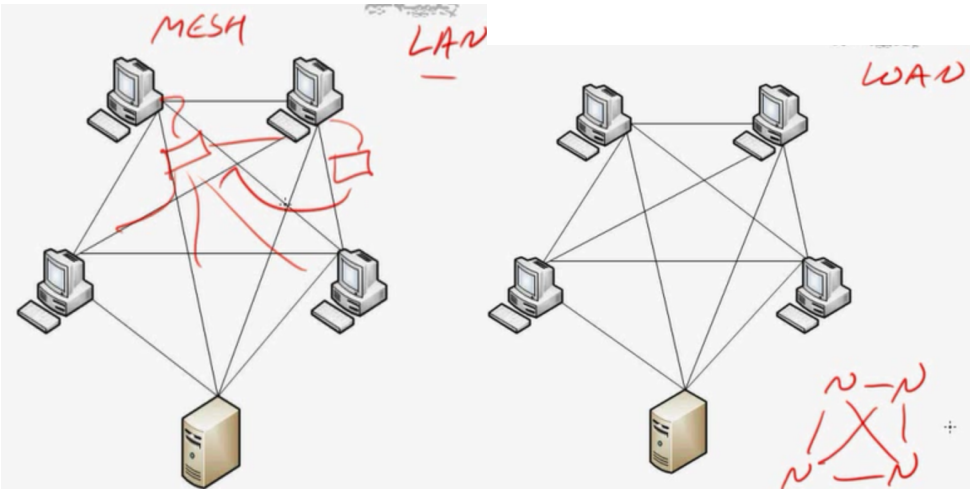


->Token used to send messages

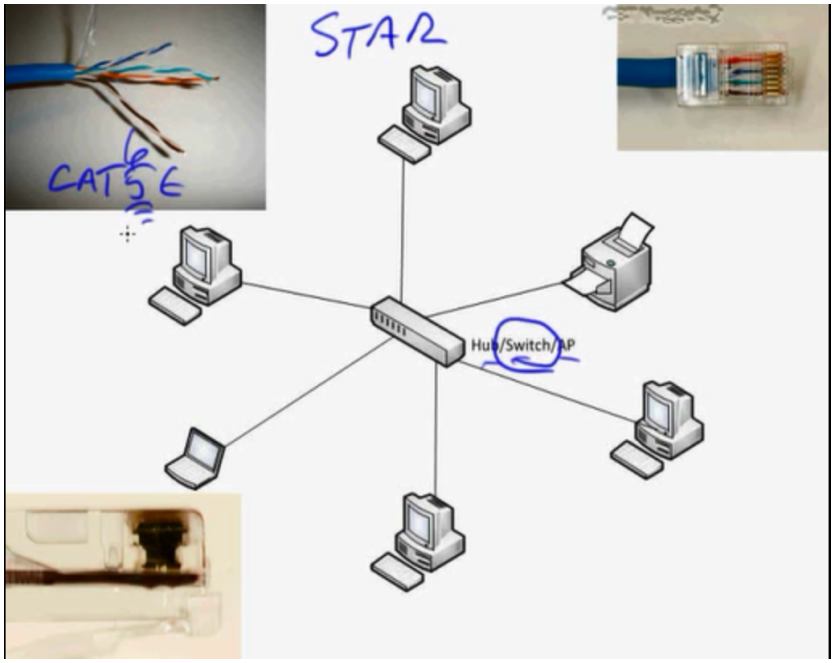


->MAU (multiple access unit)
->FDDI(Fibre data distributed Interface) is used in backbone network and uses router and switches rather than computers



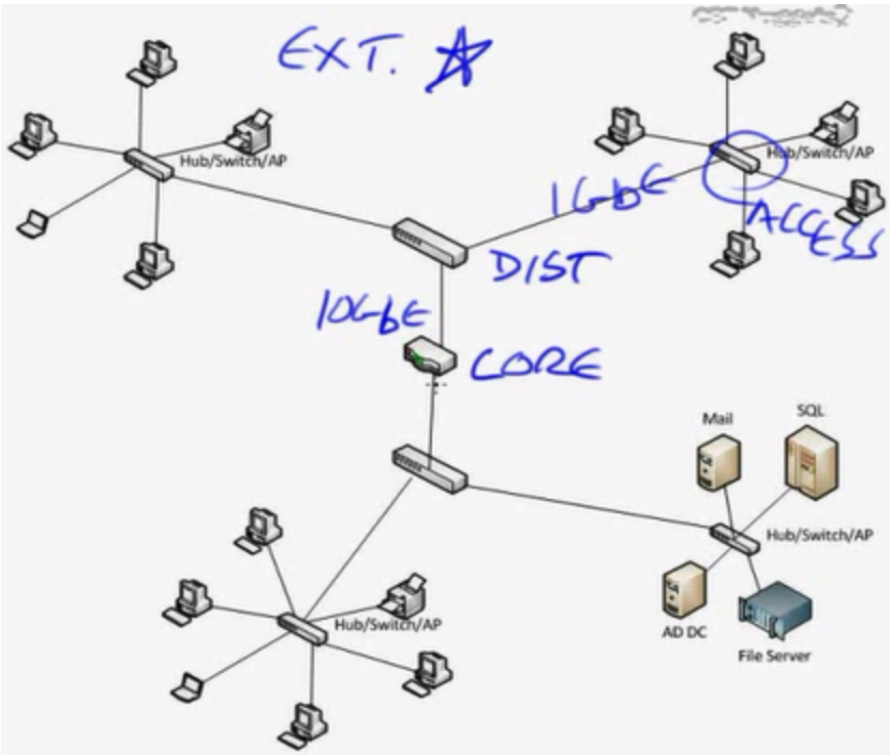


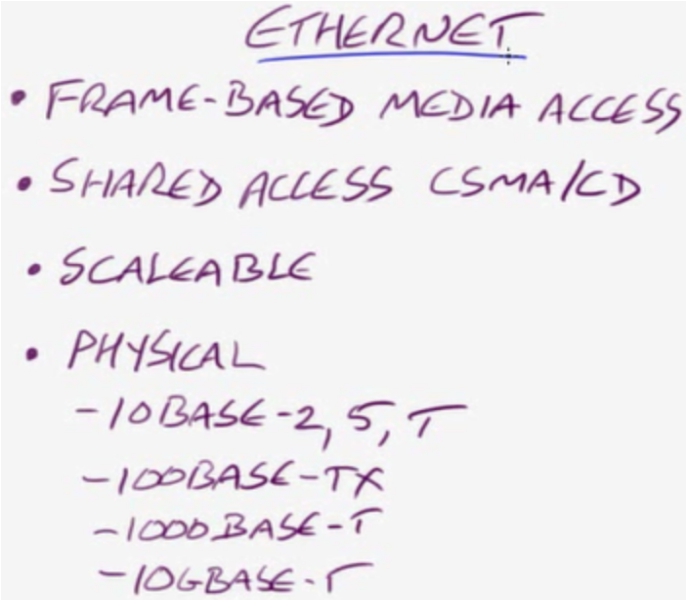
->full mesh or partial mesh usually used in WAN type connections rather than in LAN



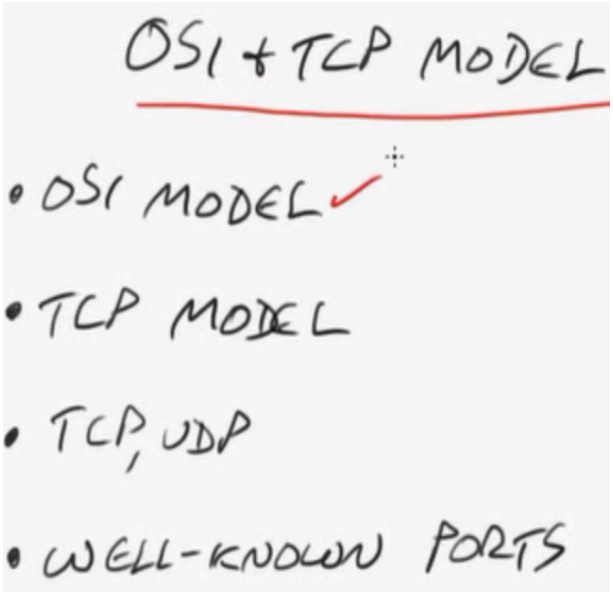
->twisted pair cables(shielded or unshielded)(STP/UTP)
->Plenum based cable
->RJ45

(Extended star topology)
->three layer design model

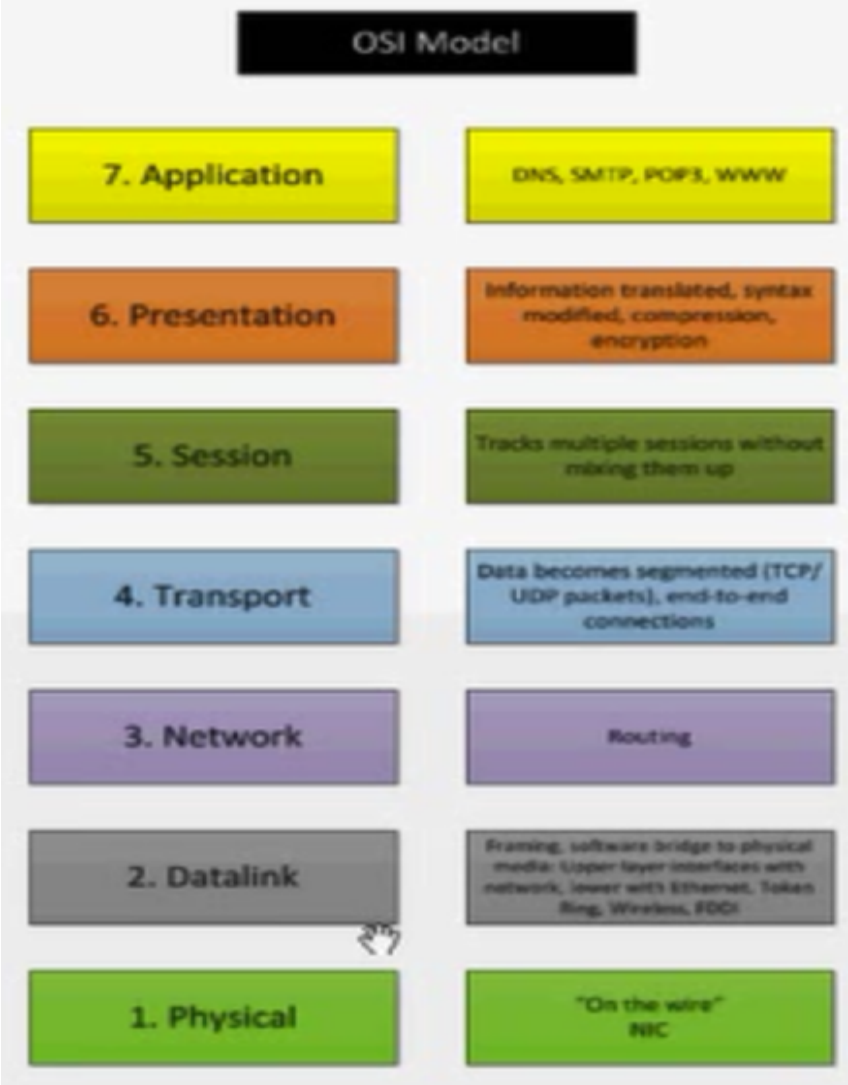




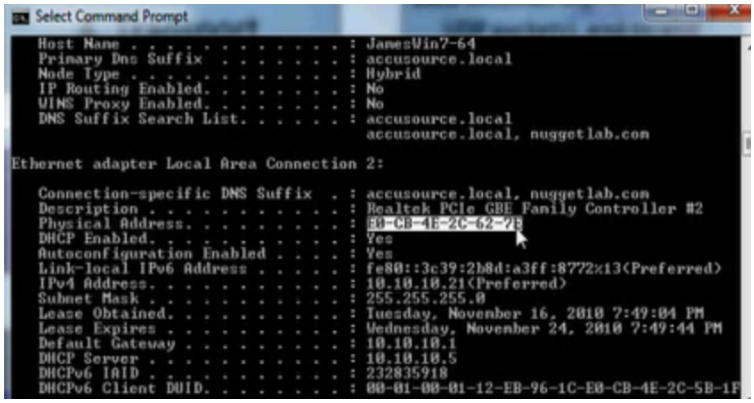
->these all go 100 meters distance
->10BASE T(10 means bandwidth and BASEband compared to Broadband i.e. dedicated)(T stands for twisted pair usually for Cat3)
->10Base-2 thinnet
->100Base-TX (commonly used these days)(4 wires two pairs each)
->1000Base-T(8 wires and 4 pair each)
->10GBase-T(twisted in a way that it provides 10Gigabit)

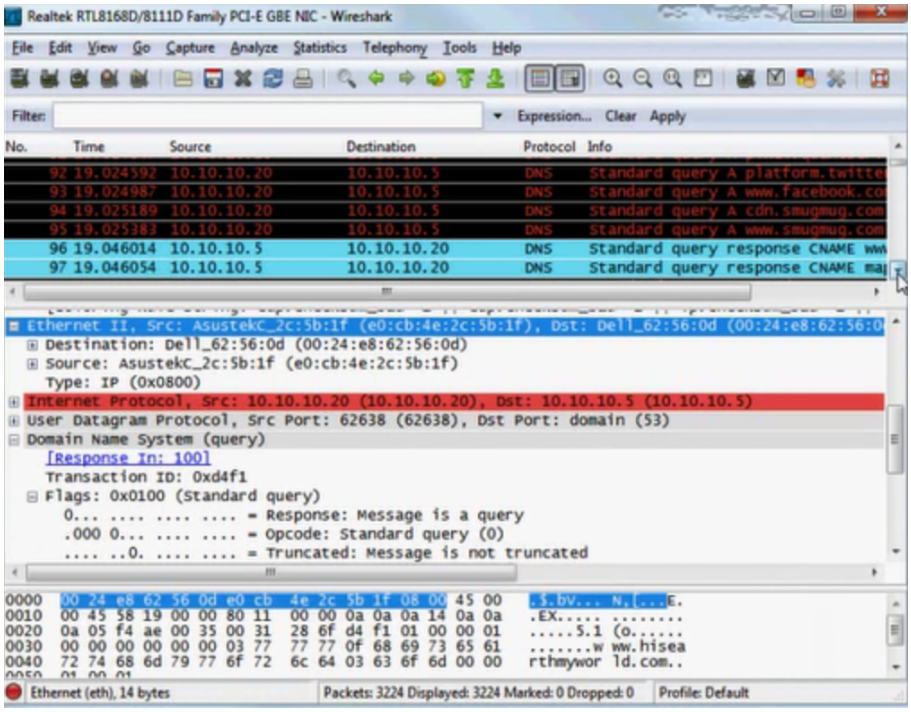


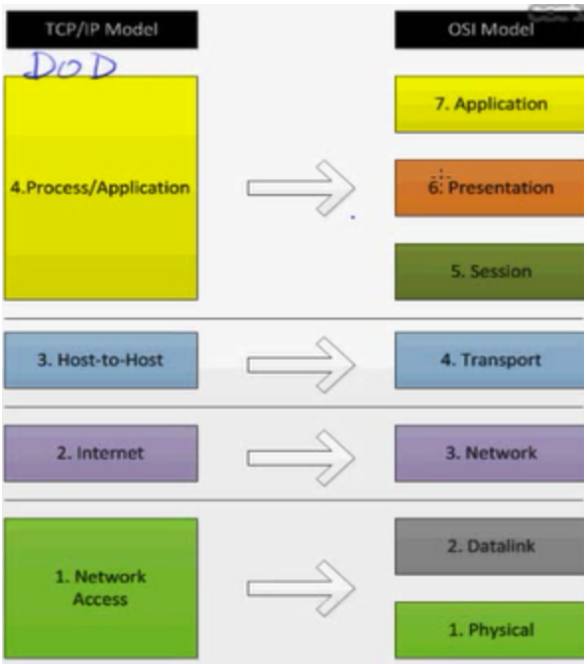
->TCP(Transmission Control Protocol)
->UDP(User Datagram Protocol)

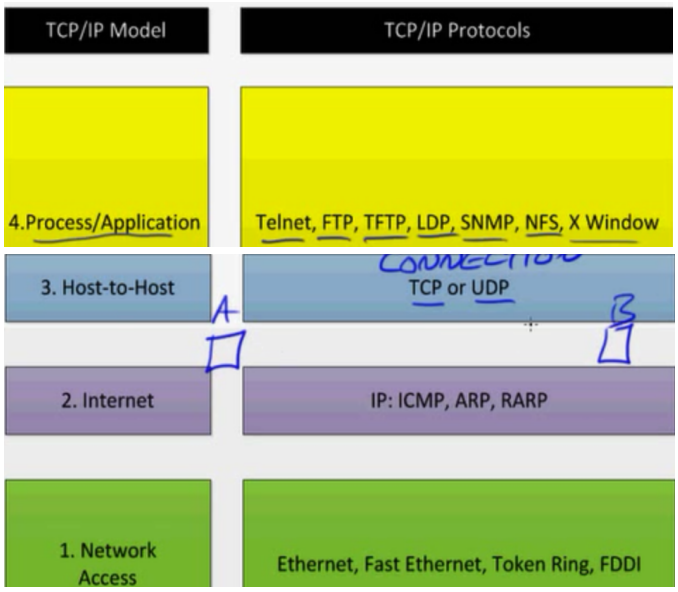


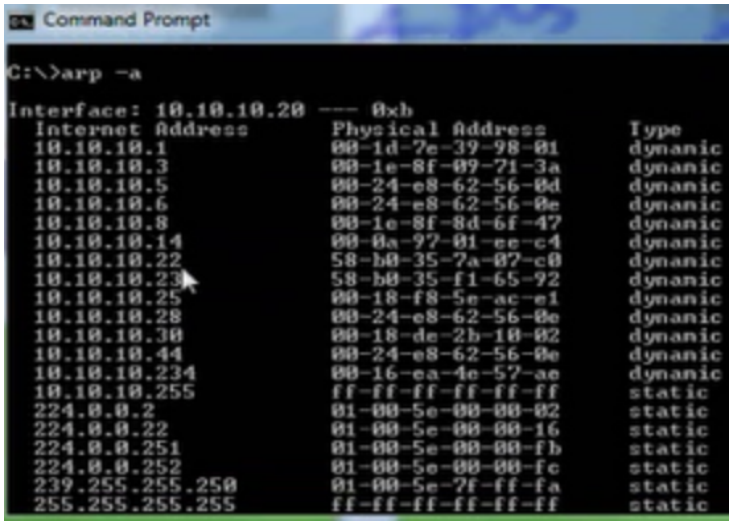
->All people seem to need data processing
->SPFB(Segment(port) Packet(IP) Frame(MAC) Bit(1 or 0))


Select Command Prompt
Host Name . . . . . : JamesWin7-64
Primary Dns Suffix . . . . . : accusource.local
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : accusource.local
accusource.local, nuggetlab.com
Ethernet adapter Local Area Connection 2:
Connection-specific DNS Suffix . : accusource.local, nuggetlab.com
Description . . . . . : Realtek PCIe GBE Family Controller #2
Physical Address. . . . . : E0-CB-4E-2C-62-2B
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::3c39:2b8d:a3ff:8772%13(Preferred)
IPv4 Address. . . . . : 10.10.10.21(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Tuesday, November 16, 2010 7:49:04 PM
Lease Expires . . . . . : Wednesday, November 24, 2010 7:49:44 PM
Default Gateway . . . . . : 10.10.10.1
DHCP Server . . . . . : 10.10.10.5
DHCPv6 IAID . . . . . : 232835918
DHCPv6 Client DUID. . . . . : 00-01-00-01-12-EB-96-1C-E0-CB-4E-2C-5B-1F


Realtek RTL8168D/8111D Family PCI-E GBE NIC - Wireshark
File Edit View Go Capture Analyze Statistics Telephony Tools Help
Filter:
Expression... Clear Apply
No. Time Source Destination Protocol Info
92 19.024592 10.10.10.20 10.10.10.5 DNS Standard query A platform.twitte
93 19.024987 10.10.10.20 10.10.10.5 DNS Standard query A www.facebook.co
94 19.025189 10.10.10.20 10.10.10.5 DNS Standard query A cdn.smugmug.com
95 19.025383 10.10.10.20 10.10.10.5 DNS Standard query A www.smugmug.com
96 19.046014 10.10.10.5 10.10.10.20 DNS Standard query response CNAME ww
97 19.046054 10.10.10.5 10.10.10.20 DNS Standard query response CNAME ma
Ethernet II, Src: AsustekC_2c:5b:1f (e0:cb:4e:2c:5b:1f), Dst: Dell_62:56:0d (00:24:e8:62:56:0
Destination: Dell_62:56:0d (00:24:e8:62:56:0d)
Source: AsustekC_2c:5b:1f (e0:cb:4e:2c:5b:1f)
Type: IP (0x0800)
Internet Protocol, Src: 10.10.10.20 (10.10.10.20), Dst: 10.10.10.5 (10.10.10.5)
User Datagram Protocol, Src Port: 62638 (62638), Dst Port: domain (53)
Domain Name System (query)
[Response In: 100]
Transaction ID: 0xd4f1
Flags: 0x0100 (Standard query)
0... .... = Response: Message is a query
.000 0... .... = Opcode: Standard query (0)
.... ..0. .... = Truncated: Message is not truncated
0000 00 24 e8 62 56 0d e0 cb 4e 2c 5b 1f 08 00 45 00
0010 00 45 58 19 00 00 80 11 00 00 0a 0a 0a 14 0a 0a
0020 0a 05 f4 ae 00 35 00 31 28 6f d4 f1 01 00 00 01
0030 00 00 00 00 00 00 03 77 77 77 0f 68 69 73 65 61
0040 72 74 68 6d 79 77 6f 72 6c 64 03 63 6f 6d 00 00
Ethernet (eth), 14 bytes
Packets: 3224 Displayed: 3224 Marked: 0 Dropped: 0
Profile: Default


TCP/IP Model
DoD
OSI Model
4.Process/Application
7. Application
6. Presentation
5. Session
3. Host-to-Host
4. Transport
2. Internet
3. Network
1. Network Access
2. Datalink
1. Physical

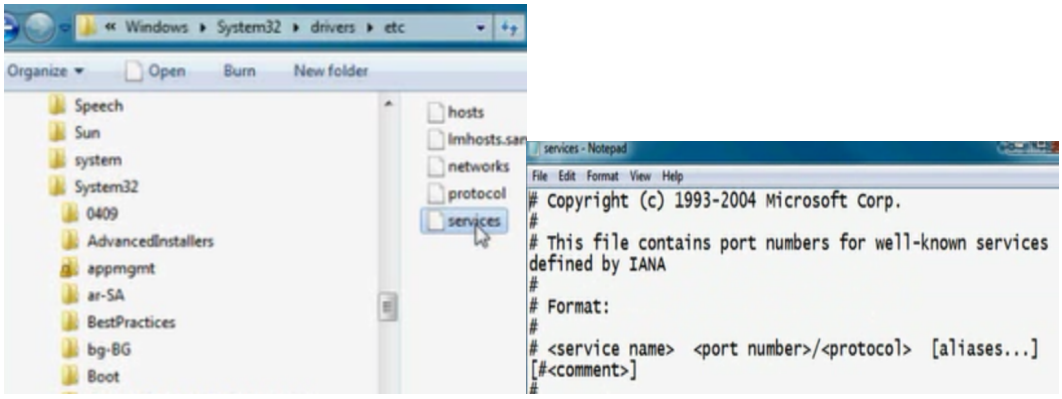


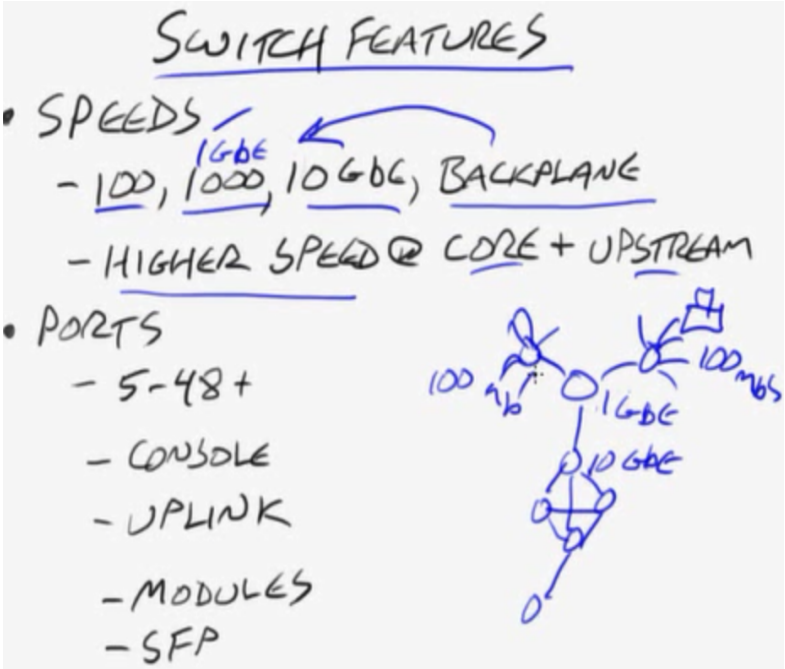


```
Command Prompt

C:\>arp -a

Interface: 10.10.10.20 --- 0xb
  Internet Address      Physical Address      Type
  10.10.10.1            00-1d-7e-39-98-01     dynamic
  10.10.10.3            00-1e-8f-09-71-3a     dynamic
  10.10.10.5            00-24-e8-62-56-0d     dynamic
  10.10.10.6            00-24-e8-62-56-0e     dynamic
  10.10.10.8            00-1e-8f-8d-6f-47     dynamic
  10.10.10.14           00-0a-97-01-ee-c4     dynamic
  10.10.10.22           58-b0-35-7a-07-c0     dynamic
  10.10.10.23           58-b0-35-f1-65-92     dynamic
  10.10.10.25           00-18-f8-5e-ac-e1     dynamic
  10.10.10.28           00-24-e8-62-56-0e     dynamic
  10.10.10.30           00-18-de-2b-10-02     dynamic
  10.10.10.44           00-24-e8-62-56-0e     dynamic
  10.10.10.234          00-16-ea-4e-57-ae     dynamic
  10.10.10.255          ff-ff-ff-ff-ff-ff     static
  224.0.0.2             01-00-5e-00-00-02     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static
```

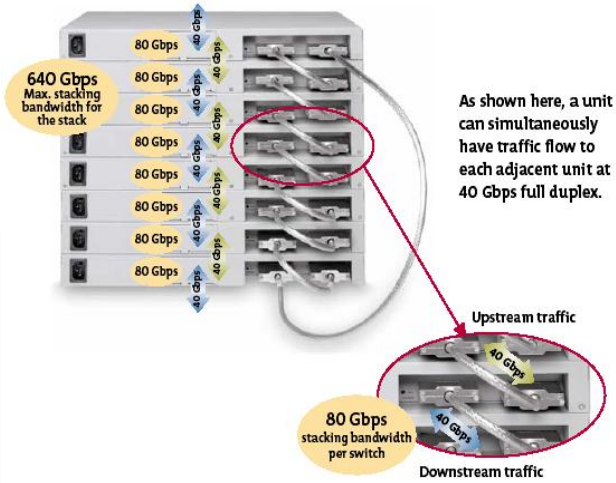
Common Protocols and Ports

Protocol	Port	Description
FTP (File Transfer Protocol)	TCP 21 (control) TCP 20 (data)	List files and directories, transfer files.
TFTP (Trivial File Transfer Protocol	UDP 69	Transfers files using smaller, faster blocks (compared to FTP). No directory listing. No authentication.
Telnet	TCP 23	A software shell to remotely administer system (e.g., server, router). Not secure – often replaced with SSH.
Domain Name Server (DNS) AKA Domain Naming System	TCP 53 (zone transfer) UDP 53 (queries)	Servers that resolve FQDNs to IP addresses.
Post Office Protocol (POP3)	TCP 110	Download email.
Simple Mail Transport Protocol (SMTP)	TCP 25	Sends email from client to email server(s).
Internet Message Access Protocol (IMAP)	TCP 143	IMAP4 is current version. An improvement over POP. Can maintain constant connection, view headers, download selected emails, search features, authentication.
NetBIOS Name Service	TCP 137, 139 UDP 137, 138	Microsoft protocol to identify and resolve single-label names.
Hypertext Transfer Protocol (HTTP)	TCP 80	View web pages.
HTTP over TLS/SSL	TCP 443	HTTP secured with TLS/SSL.
Kerberos	TCP 88 UDP 88	Kerberos is an authentication model and is used in Active Directory.
Lightweight Directory Access Protocol (LDAP)	TCP 389	Access to a directory of objects such as users, groups, computers, sites, and more. Used in Active Directory.
BootPs (server) BootPc (client)	67 UDP 67 TCP	Allow DHCP traffic to traverse routers





->10Gigabit (higher throughput and higher data rate)
->SFP=Small Form Factor Pluggable transeiver
(stackable switches to increase the number of ports)



SWITCH FEATURES

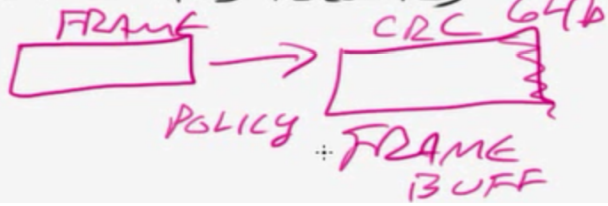
- NUMBER OF UPLINKS
- SPEED OF UPLINKS
- MANAGED/UNMANAGED
- SECURITY
- HW REDUNDANCY
- MAC TABLE

SWITCHING TYPES

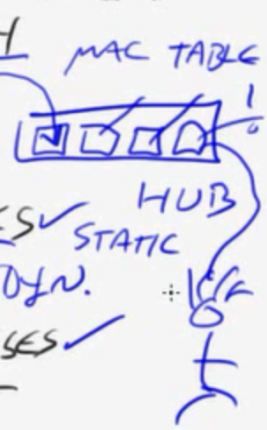
- CUT-THROUGH (REAL-TIME)
- FRAGMENTFREE (MODIFIED CUT-THROUGH)
- STORE-AND-FORWARD

->CRC check (cyclical redundancy check)

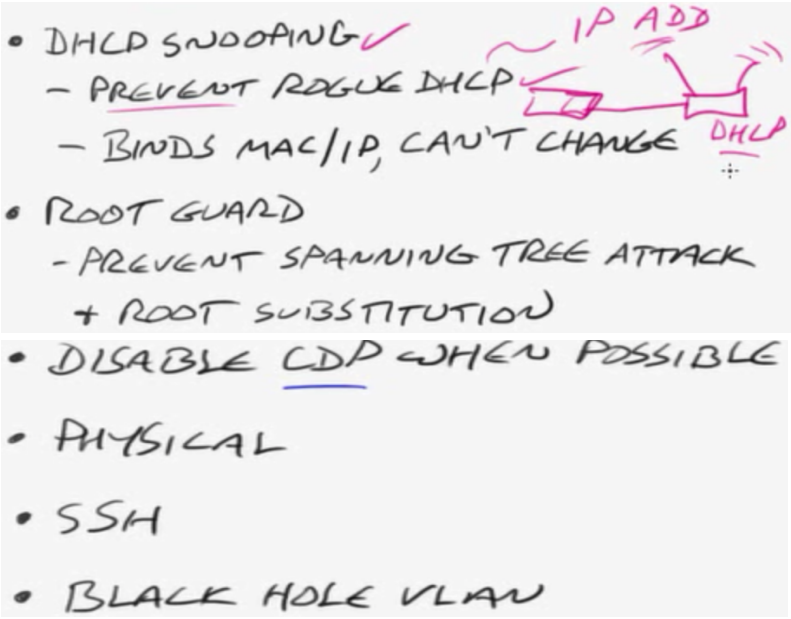
- STORE-AND-FORWARD



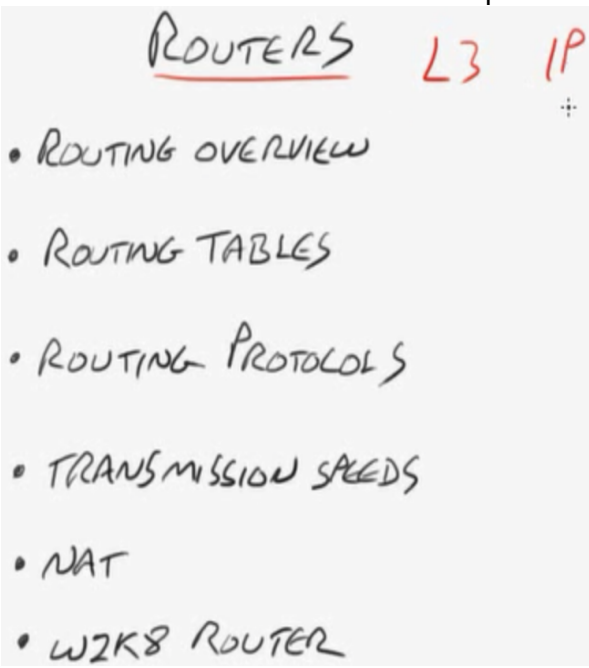
SWITCH SECURITY

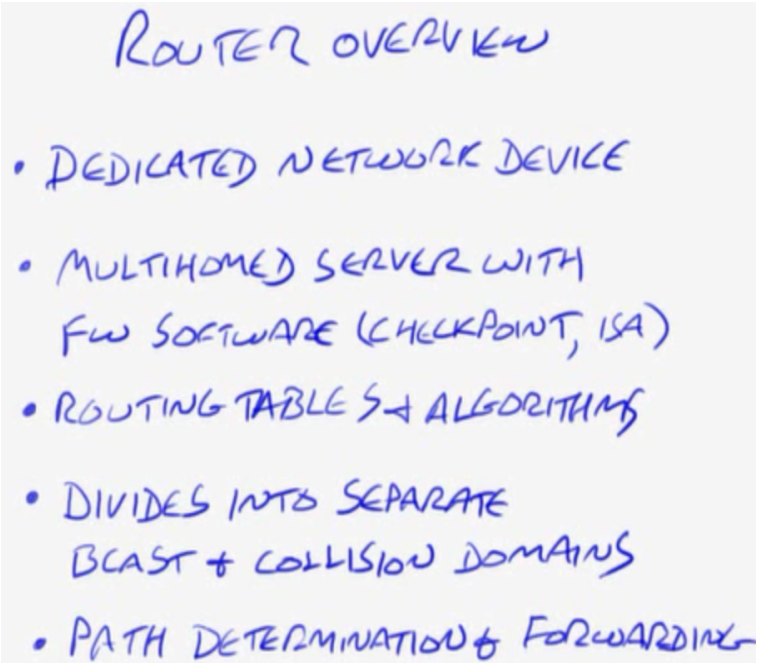


- PORT SECURITY
  - PREVENT L2 ATTACKS (DSNIFF, MACOF)
  - SECURE MAC ADDRESSES
  - LIMIT MAC PER PORT
- PRIVATE VLAN
  - LIMIT ACCESSIBILITY + DAMAGE

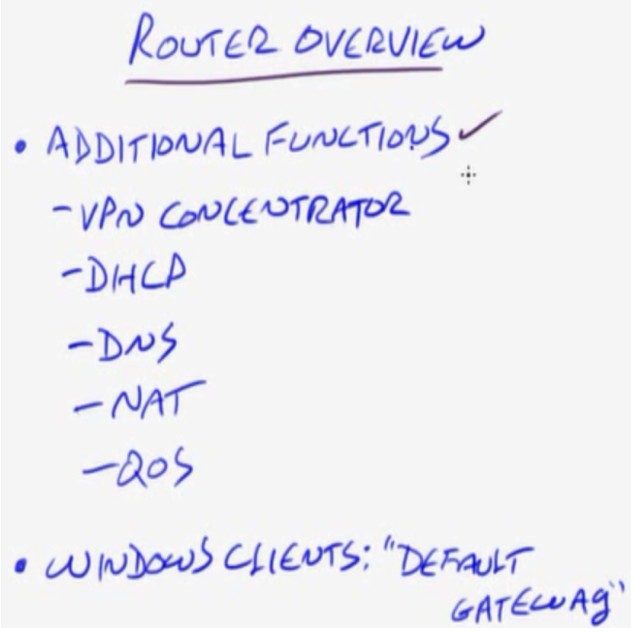


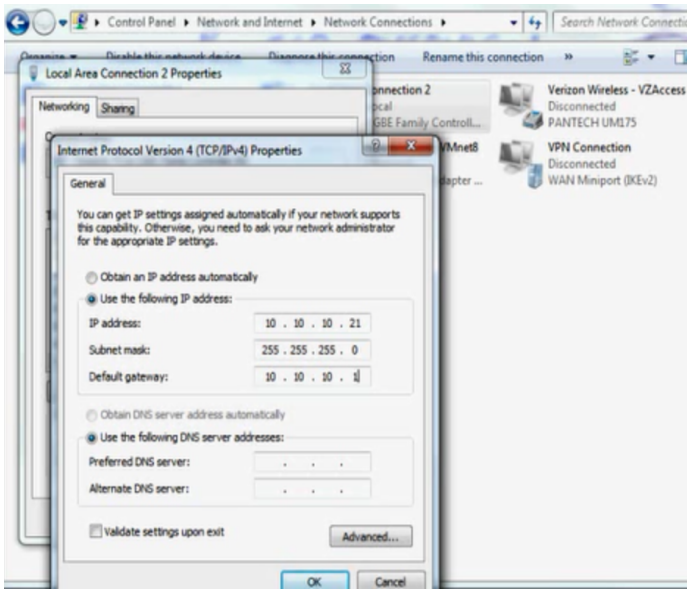
->Hacking tools (DSNIFF/MACOF/SMAC)
->black hole vlans for the ports which are not in use

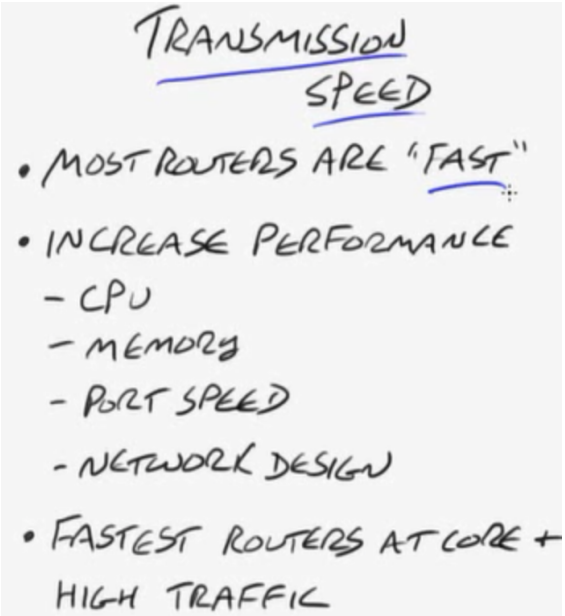


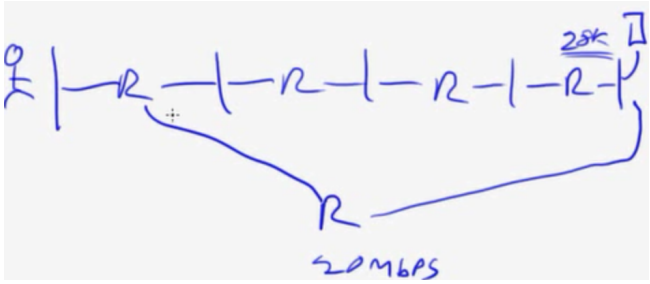


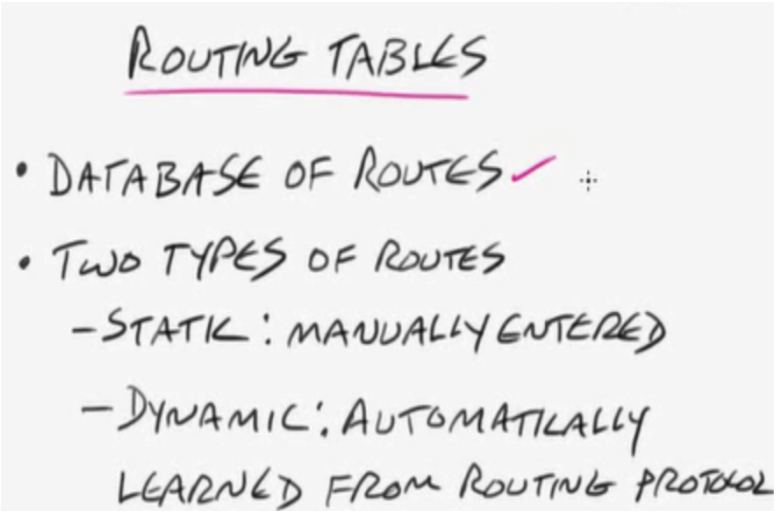
->Router could be hardware or software (windows server)



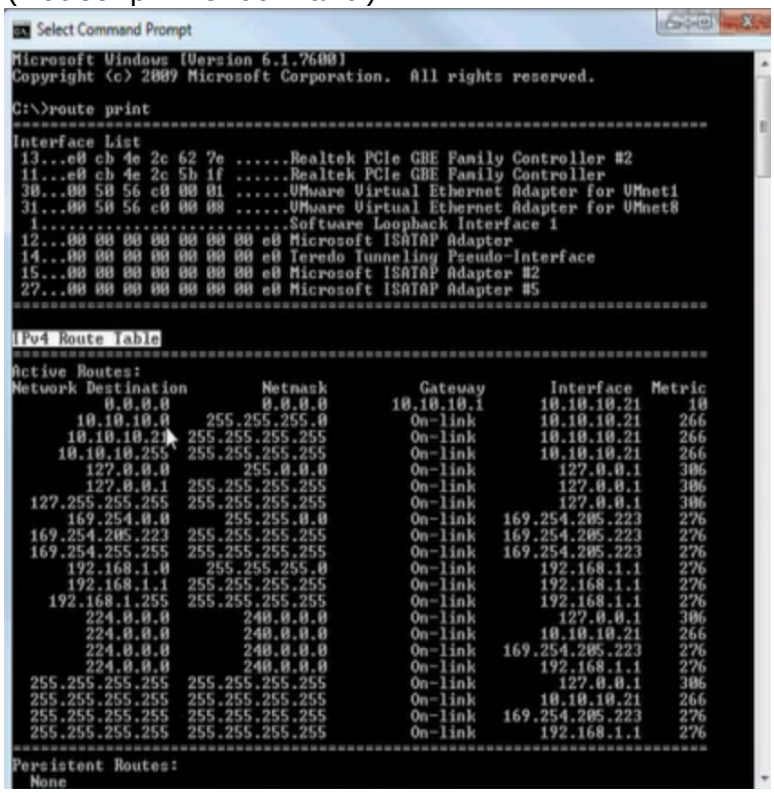

Control Panel ▸ Network and Internet ▸ Network Connections ▸
Search Network Connections
Rename this connection
Local Area Connection 2 Properties
Networking
Sharing
Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 10 . 10 . 10 . 21
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 10 . 10 . 10 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel
Verizon Wireless - VZAccess
Disconnected
PANTECH UM175
VPN Connection
Disconnected
WAN Miniport (IKEv2)


TRANSMISSION SPEED
• MOST ROUTERS ARE "FAST"
• INCREASE PERFORMANCE
- CPU
- MEMORY
- PORT SPEED
- NETWORK DESIGN
• FASTEST ROUTERS AT CORE + HIGH TRAFFIC


R
R
R
R
25K
R
20MBPS

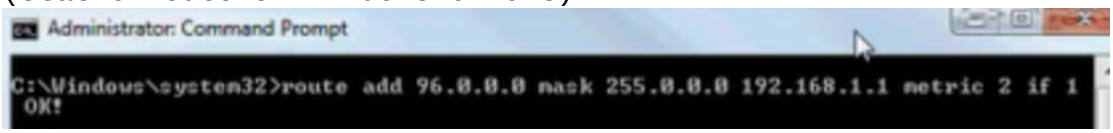


(route print command)



```
Select Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\>route print
===========================================================================
Interface List
 13...e0 cb 4e 2c 62 7e ......Realtek PCIe GBE Family Controller #2
 11...e0 cb 4e 2c 5b 1f ......Realtek PCIe GBE Family Controller
 30...00 50 56 c0 00 01 ......VMware Virtual Ethernet Adapter for VMnet1
 31...00 50 56 c0 00 08 ......VMware Virtual Ethernet Adapter for VMnet8
  1...........................Software Loopback Interface 1
 12...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter
 14...00 00 00 00 00 00 00 e0 Teredo Tunneling Pseudo-Interface
 15...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #2
 27...00 00 00 00 00 00 00 e0 Microsoft ISATAP Adapter #5
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0       10.10.10.1      10.10.10.21     10
       10.10.10.0    255.255.255.0         On-link       10.10.10.21    266
      10.10.10.21  255.255.255.255         On-link       10.10.10.21    266
     10.10.10.255  255.255.255.255         On-link       10.10.10.21    266
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    306
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    306
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    306
      169.254.0.0      255.255.0.0         On-link   169.254.205.223    276
  169.254.205.223  255.255.255.255         On-link   169.254.205.223    276
  169.254.255.255  255.255.255.255         On-link   169.254.205.223    276
      192.168.1.0    255.255.255.0         On-link       192.168.1.1    276
      192.168.1.1  255.255.255.255         On-link       192.168.1.1    276
    192.168.1.255  255.255.255.255         On-link       192.168.1.1    276
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    306
        224.0.0.0        240.0.0.0         On-link       10.10.10.21    266
        224.0.0.0        240.0.0.0         On-link   169.254.205.223    276
        224.0.0.0        240.0.0.0         On-link       192.168.1.1    276
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    306
  255.255.255.255  255.255.255.255         On-link       10.10.10.21    266
  255.255.255.255  255.255.255.255         On-link   169.254.205.223    276
  255.255.255.255  255.255.255.255         On-link       192.168.1.1    276
===========================================================================
Persistent Routes:
  None
```

->if it is not on-link or on the same network the client send the traffic to default router 0.0.0.0 to default gateway (static route on windows client)



```
Administrator: Command Prompt
C:\Windows\system32>route add 96.0.0.0 mask 255.0.0.0 192.168.1.1 metric 2 if 1
 OK!
```

C:\>route delete 96.0.0.0 (to remove static route)

ROUTING TABLES

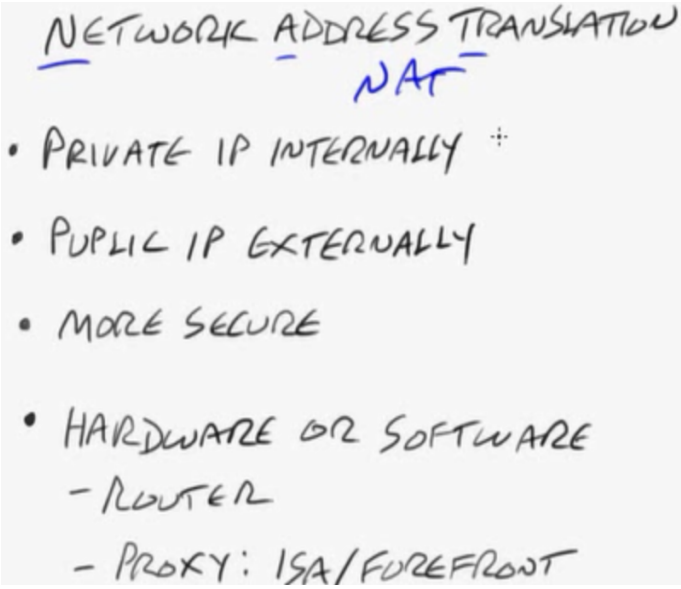
- SELECTING ROUTES:
  - COST
  - HOPS
- DEFAULT ROUTES
- SOFTWARE ROUTING WINDOWS

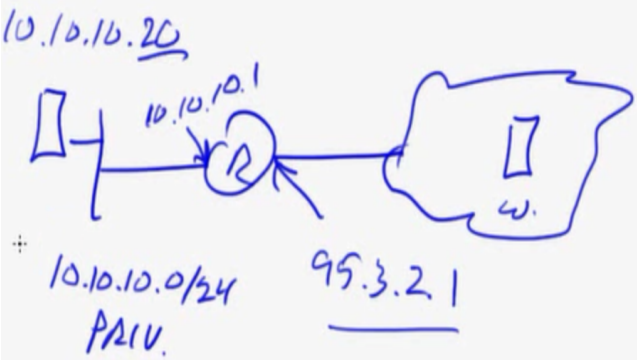
DISTANCE VECTOR

- RIP, IGRP
- EASY TO CONFIGURE
- SENDS ENTIRE TABLE AT INTERVALS
- PRONE TO LOOPS

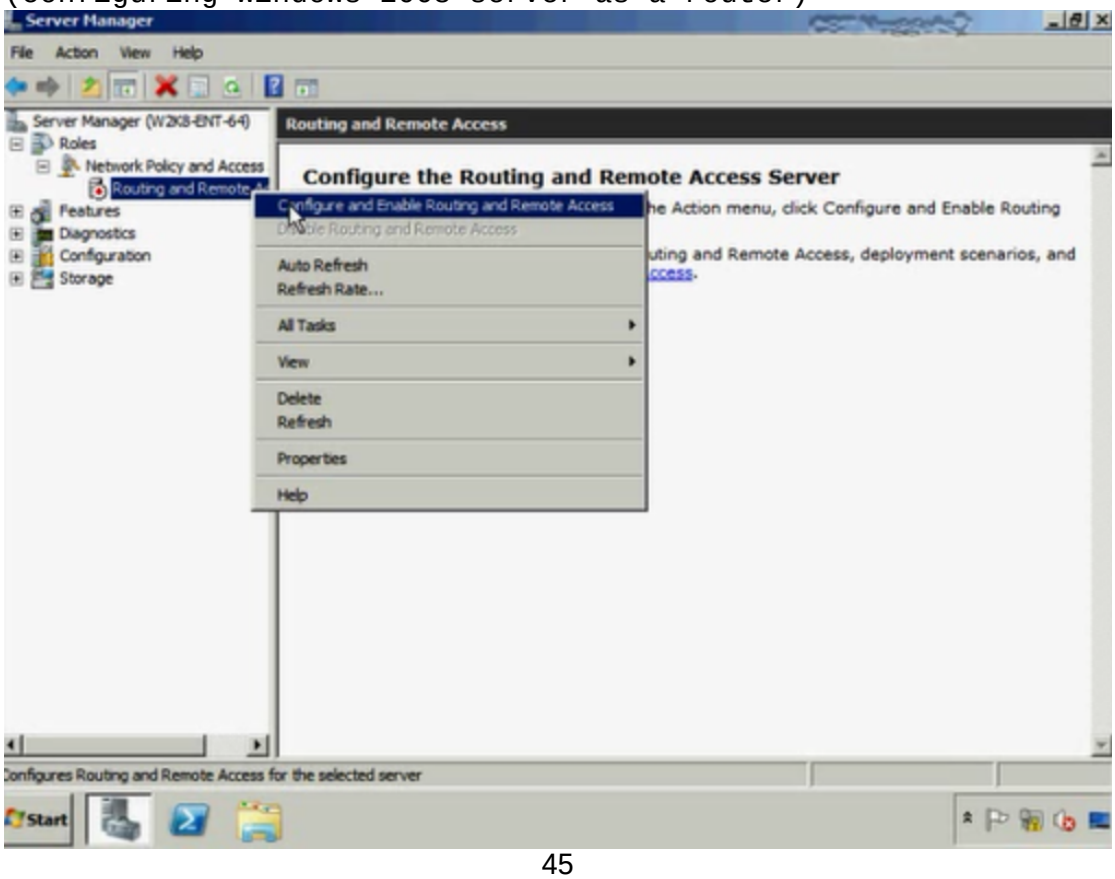
LINK STATE

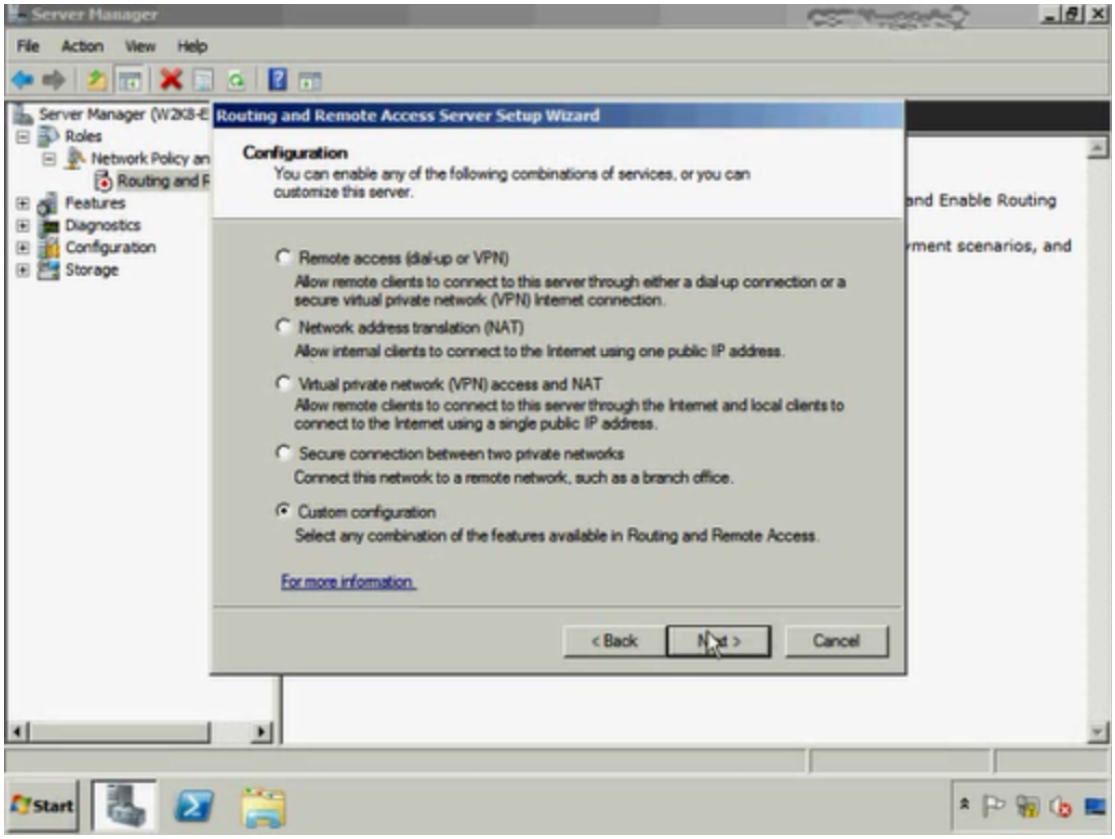
- OSPF, IS-IS, EIRGP
- TECHNICALLY DIFFICULT
- MANY FEATURES
- NO LOOPING ISSUES
- NEIGHBOR UPDATES (NOT BCAST, MCAST)
- UPDATES AS NEEDED

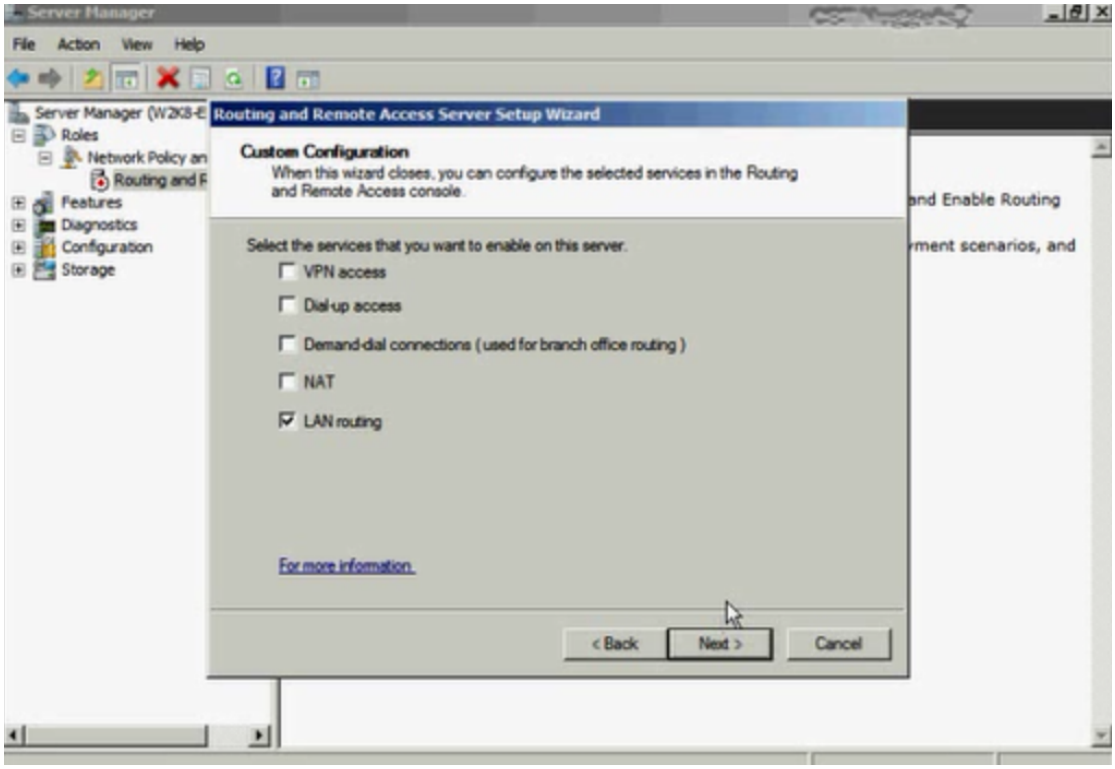


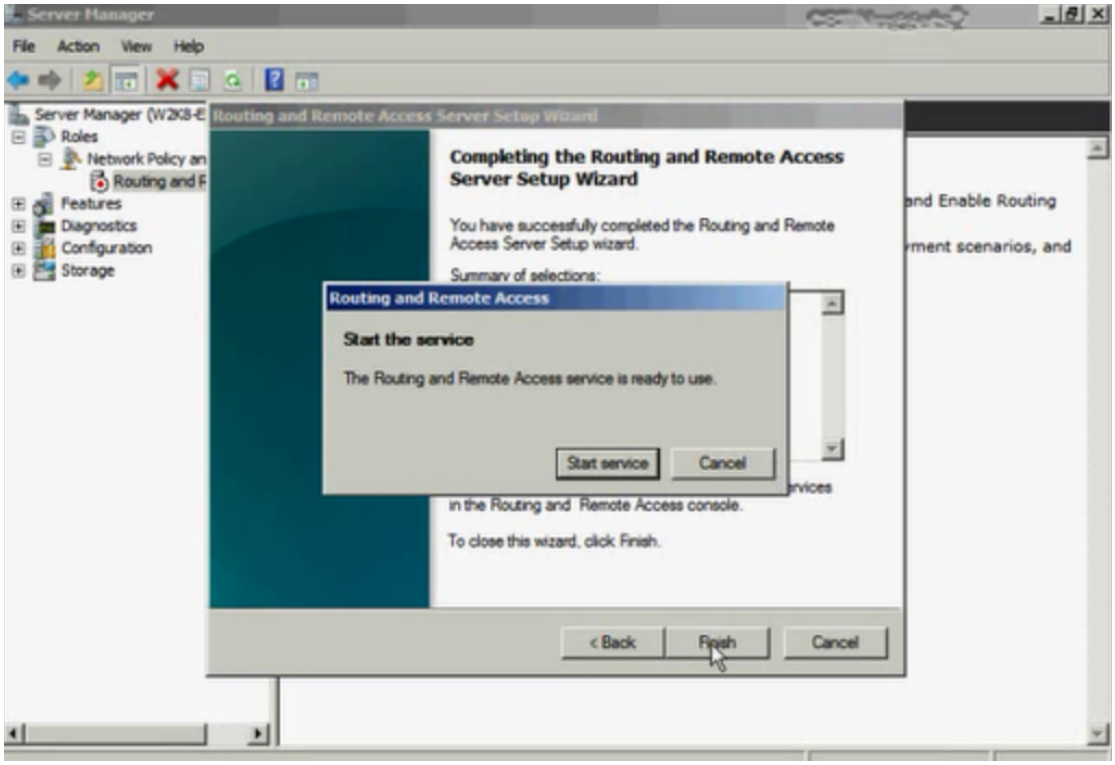


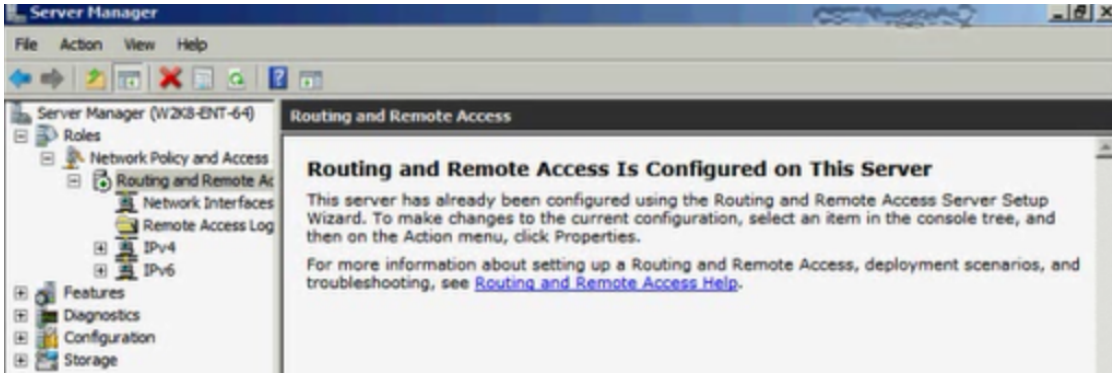
(configuring windows 2008 server as a router)



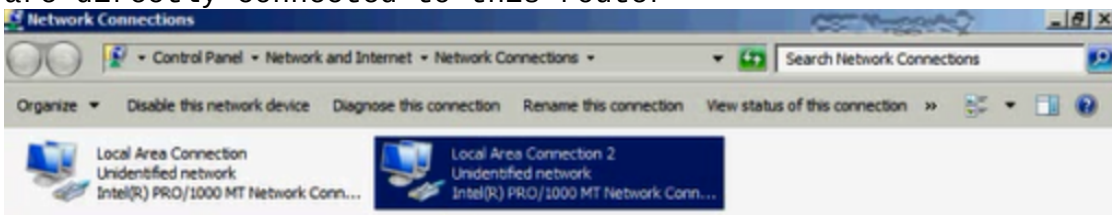

Server Manager
File Action View Help
Server Manager (W2K8-E
Roles
Network Policy an
Routing and R
Features
Diagnostics
Configuration
Storage
Routing and Remote Access Server Setup Wizard
Configuration
You can enable any of the following combinations of services, or you can customize this server.
Remote access (dial-up or VPN)
Allow remote clients to connect to this server through either a dial-up connection or a secure virtual private network (VPN) Internet connection.
Network address translation (NAT)
Allow internal clients to connect to the Internet using one public IP address.
Virtual private network (VPN) access and NAT
Allow remote clients to connect to this server through the Internet and local clients to connect to the Internet using a single public IP address.
Secure connection between two private networks
Connect this network to a remote network, such as a branch office.
Custom configuration
Select any combination of the features available in Routing and Remote Access.
For more information
< Back
Next >
Cancel
nd Enable Routing
rment scenarios, and
Start


Server Manager
File Action View Help
Server Manager (W2K8-E
Roles
Network Policy an
Routing and R
Features
Diagnostics
Configuration
Storage
Routing and Remote Access Server Setup Wizard
Custom Configuration
When this wizard closes, you can configure the selected services in the Routing and Remote Access console.
Select the services that you want to enable on this server.
VPN access
Dial-up access
Demand-dial connections (used for branch office routing)
NAT
LAN routing
For more information
< Back
Next >
Cancel
nd Enable Routing
rment scenarios, and

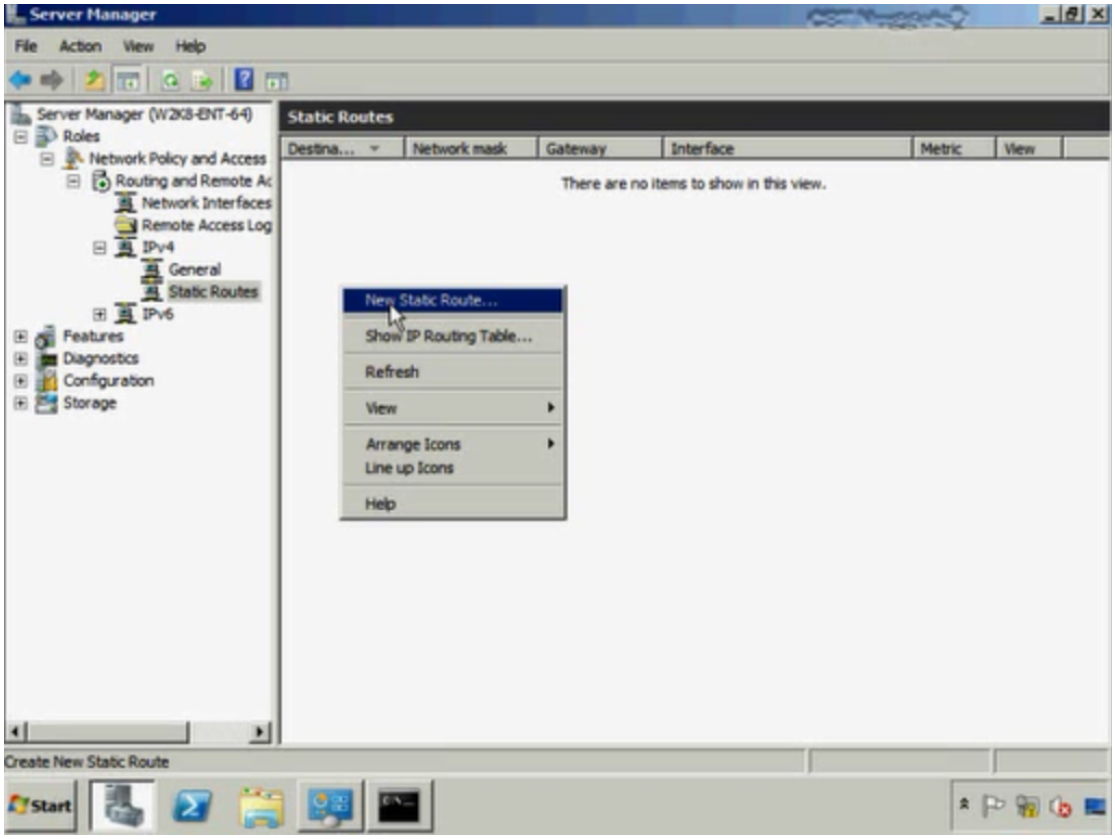


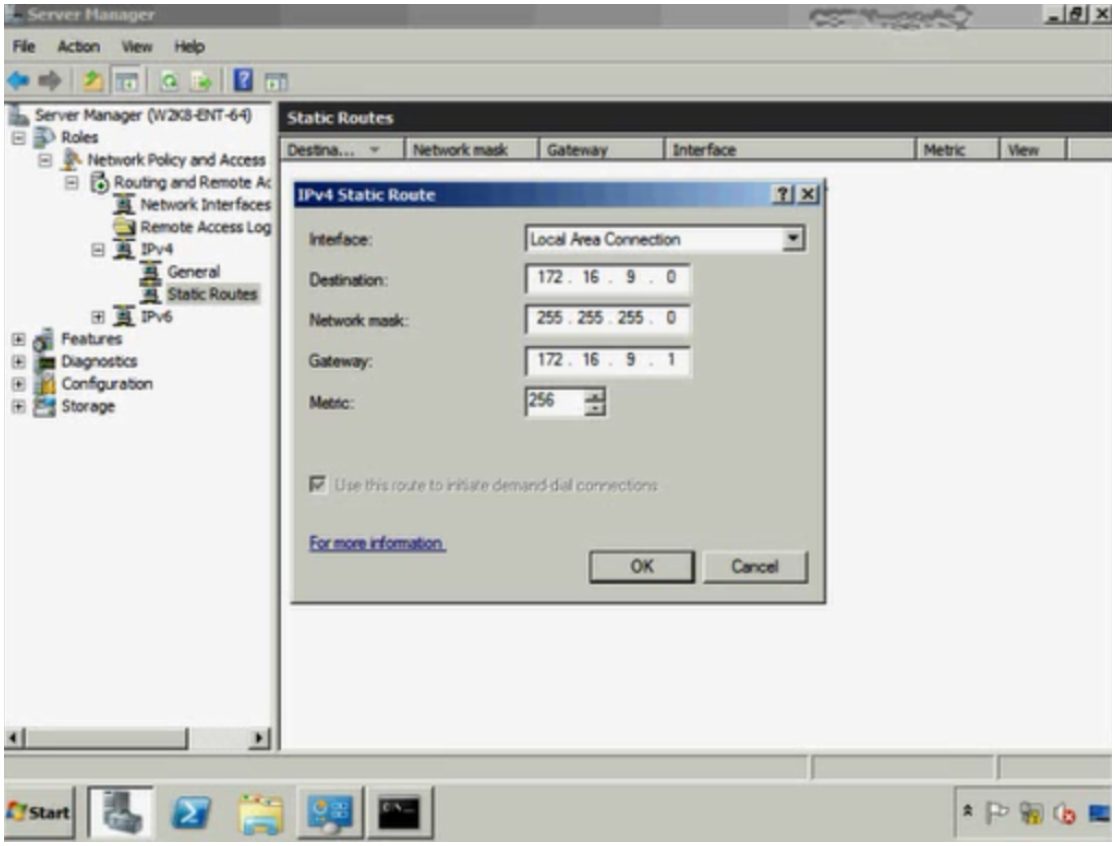


->didn't have to configure the static routes as the clients are directly connected to this router

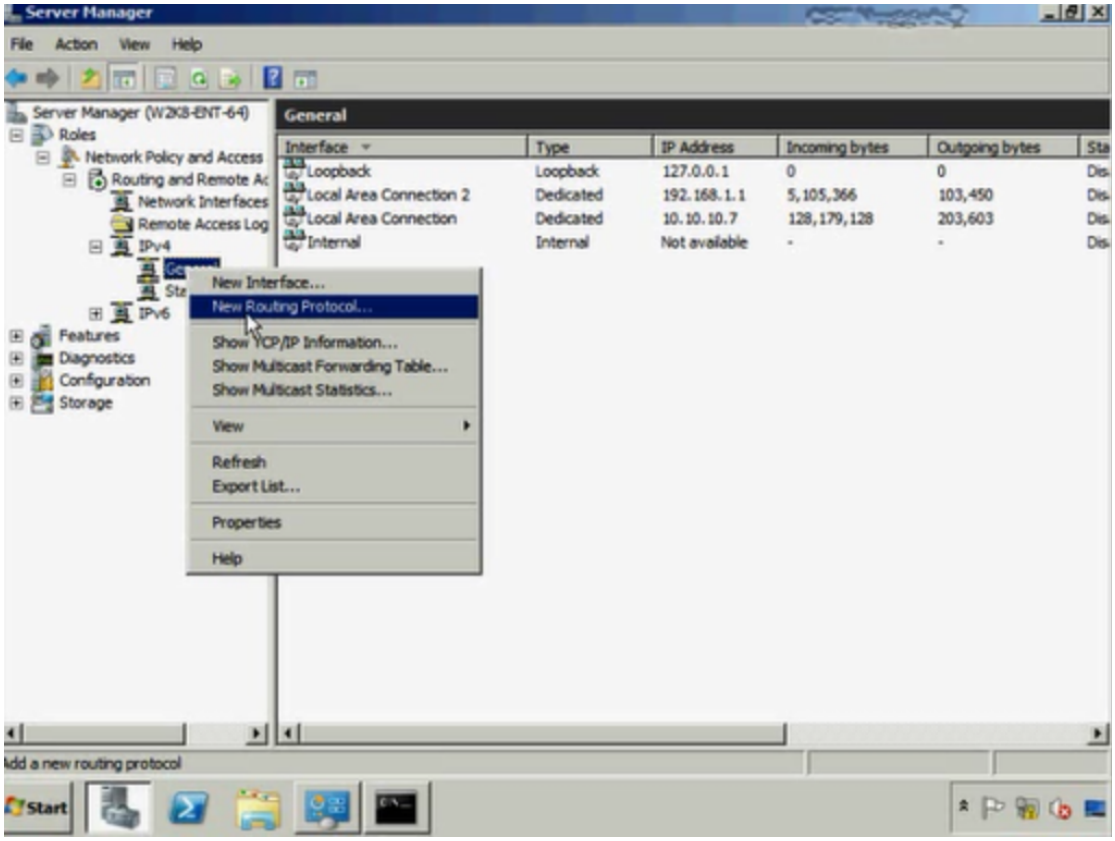


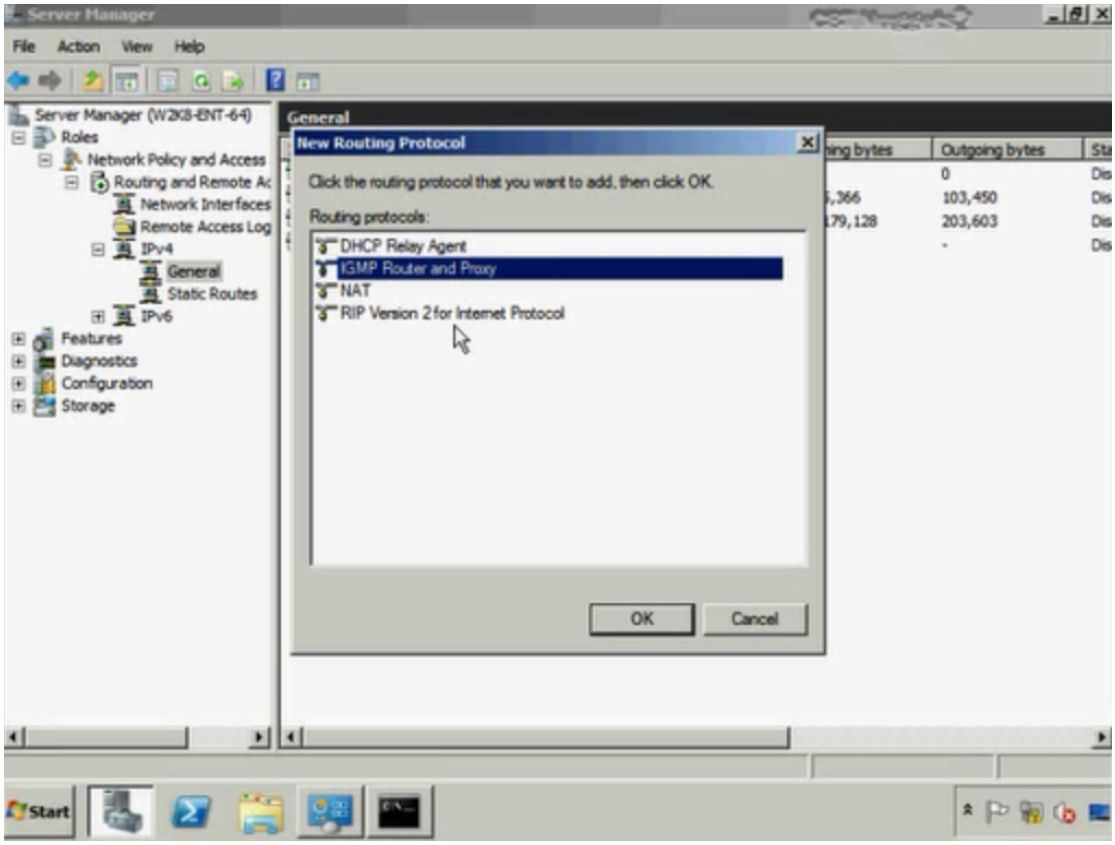
(adding static route)





->if you add routes in UI, it won't show up in command prompt


Server Manager
File Action View Help
Server Manager (W2K8-ENT-64)
Roles
Network Policy and Access
Routing and Remote Ac
Network Interfaces
Remote Access Log
IPv4
IPv6
Features
Diagnostics
Configuration
Storage
General
Interface
Type
IP Address
Incoming bytes
Outgoing bytes
Loopback
Loopback
127.0.0.1
0
0
Local Area Connection 2
Dedicated
192.168.1.1
5,105,366
103,450
Local Area Connection
Dedicated
10.10.10.7
128,179,128
203,603
Internal
Internal
Not available
New Interface...
New Routing Protocol...
Show TCP/IP Information...
Show Multicast Forwarding Table...
Show Multicast Statistics...
View
Refresh
Export List...
Properties
Help
Add a new routing protocol
Start


Server Manager
File Action View Help
Server Manager (W2K8-ENT-64)
Roles
Network Policy and Access
Routing and Remote Ac
Network Interfaces
Remote Access Log
IPv4
General
Static Routes
IPv6
Features
Diagnostics
Configuration
Storage
General
New Routing Protocol
Click the routing protocol that you want to add, then click OK.
Routing protocols:
DHCP Relay Agent
IGMP Router and Proxy
NAT
RIP Version 2 for Internet Protocol
OK
Cancel
Start

MEDIA TYPES

- COAXIAL ✓
- PLENUM RATING
- TWISTED PAIR
- FIBER OPTIC

COAXIAL CABLE

- SELDOM USED ✓
- COPPER CORE → PLASTIC JACKET, BRAIDED SHIELD, PVC/TEFLON ✓
- THICKNET (RG-8)
- THINNET (RG-58)
- BNC CONNECTORS ✓
- RESISTANT TO EMI, RFI

Cable Type	Common Name	Physical Layer Name	Bandwidth	Max Length (M)
RG-6	Satellite TV	N/A		N/A
RG-8	Thicknet	10Base5	10 Mbps	50 (drop) 500 (backbone)
RG-58	Thinnet	10Base2	10 Mbps	185
RG-59	Cable TV	N/A		N/A
CAT3 UTP	Fast Ethernet	10 Base-T	10/100 Mbps	100
CAT4 UTP	Fast Ethernet	10 Base-T	16 Mbps	100
CAT5	Fast Ethernet	10 Base-T 100 Base-T4 100 Base-TX	10/100 Mbps	100
CAT5e	Gigabit Ethernet	10 Base-T 100 Base-T4 100 Base-TX 1000 Base-T	10/100/1000 Mbps	100
CAT6	Gigabit Ethernet	10 Base-T 100 Base-T4 100 Base-TX 1000 Base-T	10/100/1000 Mbps	100

All Category cable can be used for Token Ring.
10 Base-T, 100 Base-TX, 100 Base-T2 use 2 wire pairs
100 Base-T4, 1000 Base-T use 4 wire pairs

PLENUM-RATED

- MATERIALS EMIT LITTLE OR NO SMOKE + NOXIOUS FUMES IN FIRE
- DON'T SPREAD FIRE
- WALLS + PLENUM
- MORE EXPENSIVE

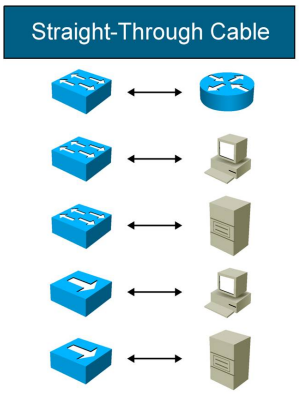
TWISTED PAIR

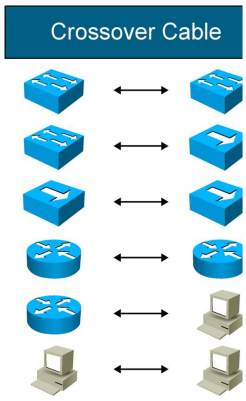
- CHEAP, EASY TO RUN
- FOUR PAIRS OF INSULATED WIRES
- TWISTED TO REDUCE CROSSTALK, EMI
- UTP OR STP
- N<SIGNALING>-X

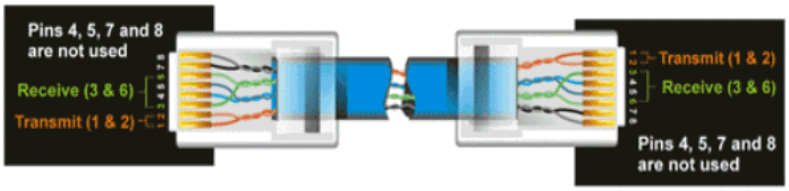
  N → 100 MBPS; SIGNALING → BASE; X → T (TWIST)
- CAT 2, 3, 4 OBSOLETE ✓
- CAT 5, 5E, 6 COMMON USE

TWISTED PAIR CONNECTORS

- RJ11/RJ45
- 568A/B
- STRAIGHT THROUGH, CROSSOVER





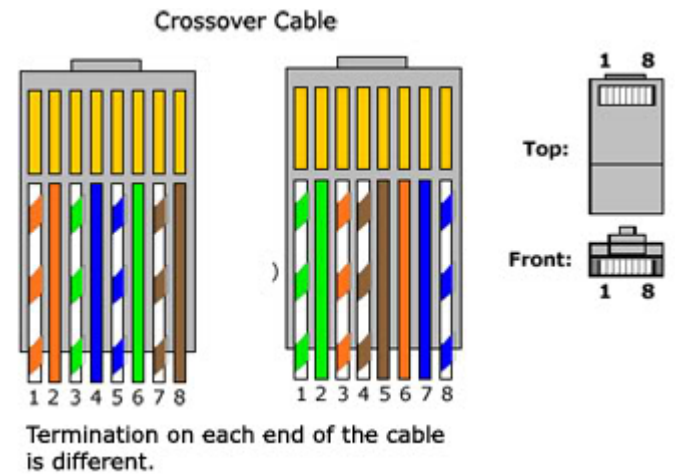


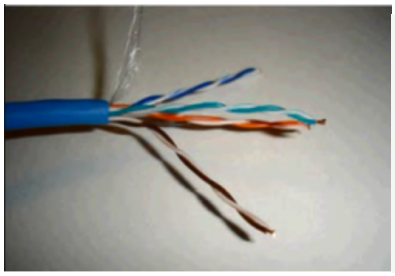
Pin number	Wire Color
Pin 1 ==>	Orange/White
Pin 2 ==>	Orange
Pin 3 ==>	Green/White
Pin 4 ==>	Blue
Pin 5 ==>	Blue/White
Pin 6 ==>	Green
Pin 7 ==>	Brown/White
Pin 8 ==>	Brown

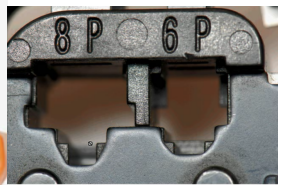
Straight-Through

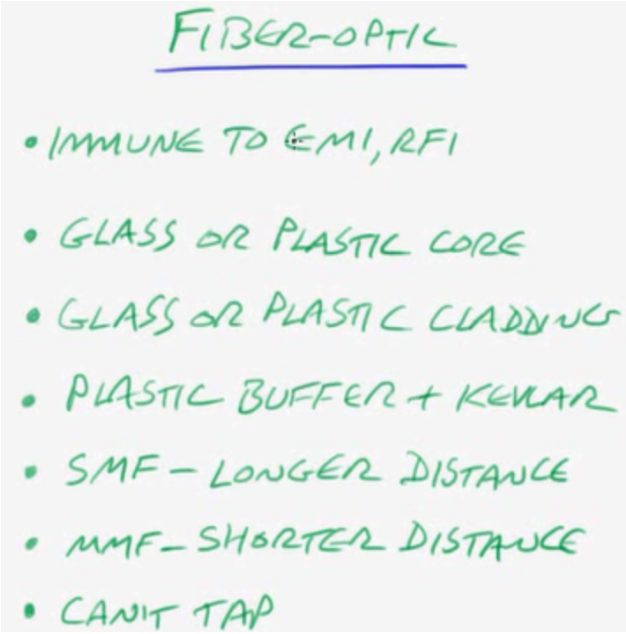
Wire	Becomes
1	1
2	2
3	3
6	6

Pin number	Wire Color
Pin 1 ==>	Orange/White
Pin 2 ==>	Orange
Pin 3 ==>	Green/White
Pin 4 ==>	Blue
Pin 5 ==>	Blue/White
Pin 6 ==>	Green
Pin 7 ==>	Brown/White
Pin 8 ==>	Brown

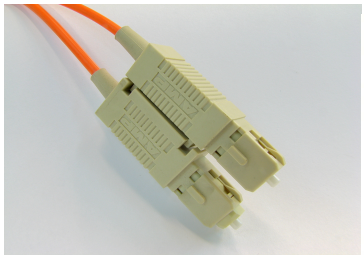






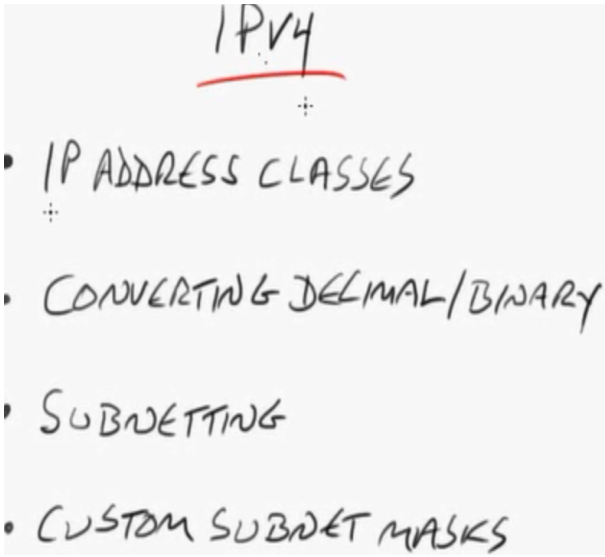


->EMI(Electromagntic Interference)
->RFI(Radio Frequency Interference)
->SMF(Single Mode Fibre)
->MMF(Multi Mode Fibre)
(SC fibre connector)




(LC Fibre connector)


(ST Fibre connector)

IP Address Classes

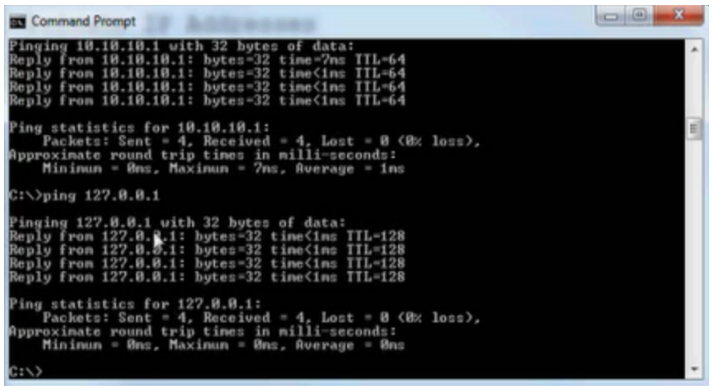
Address Class	Network ID	Default SN Mask	# Networks	# Hosts
Class A	1-126.0.0.0 (0)	255.0.0.0	126	16,777,214
Class B	128-191.0.0.0 (10)	255.255.0.0	16,384	65,534
Class C	192-223.0.0.0 (110)	255.255.255.0	2,097,152	254

Class A Loopback Address: 127.0.0.1

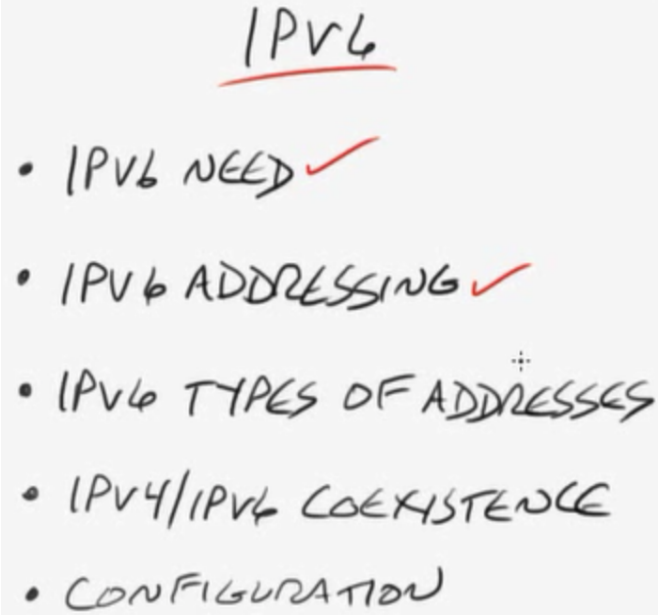
Private IP Addresses

Class A 10.0.0.1 - 10.255.255.254
Class B 172.16.0.1 - 172.31.255.254
Class C 192.168.0.1 - 192.168.255.254

Automatic Private IP Address (APIPA)
Class C 169.254.0.0/24



->private ip addresses are not routable over the internet



IPV6 NEED

- IPV4 = 4,294,967,296
  (ONLY 250M CAN BE ASSIGNED)
- IPV6:
  - 128-BIT VS 32-BIT
  - 340,282,366,920,938,463,463,374,607,431,770,000,000
  - 3,600,000 ADDRESSES FOR EVERY SQ INCH OF EARTH

->inefficiency of IPv4 is that 127.0.0.0/8 whole class address i.e. 16million addresses just for loopback testing

IPV6 ADDRESSING

- 128-BIT ADDRESS:
  - 8 GROUPS OF 4 HEX
  - CHARS: 0-9, A-F
  - COLON ":" SEPARATES
- SIMPLIFY ADDRESS EXPRESSION
  - ELIMINATE LEADING ZEROS
  - ELIMINATE CONSECUTIVE ZEROS

FD00:1D81:0006:0000:0000:0000:4C90:FF20

Decimal-Hex-Binary Conversion

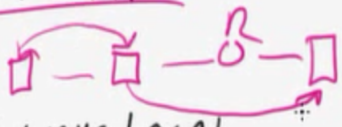
DECIMAL	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
BINARY	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

IPV6 TYPES OF ADDRESSES

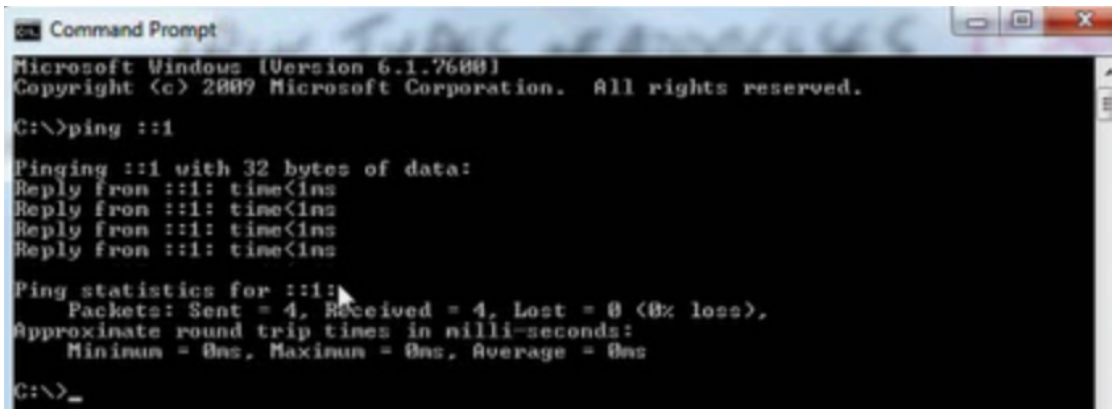
- GLOBAL SCOPE
  - INTERNET (V2) — IPV4 PUB.
  - INTERNET ROUTABLE
  - HIGHLEVEL BITS 001 (2001:/3)
- UNIQUE LOCAL (SITE-LOCAL)
  - SIMILAR TO PRIVATE IPV4
  - FC00::/7 OR FD00:/8

IPV6 TYPES OF ADDRESSES IPSEC

- LINK-LOCAL
  - SIMILAR TO IPV4 APIPA 169.254.0.0
  - FE80

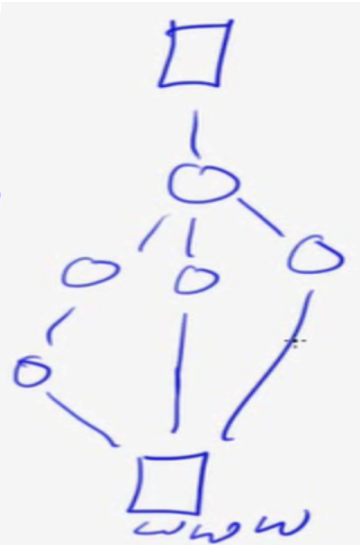


  - ALWAYS HAVE LINK-LOCAL (EVEN W/ DHCP)
- LOOPBACK ::1



IPV6 TYPES OF ADDRESSES

- ANYCAST ✓
  - VISUALLY SIMILAR TO GLOBAL
  - MANY DESTINATION HOSTS W/SAME ADDRESS ✓
  - FIND NEAREST BASED ON ROUTER COST



IPV4/IPV6 COEXISTENCE

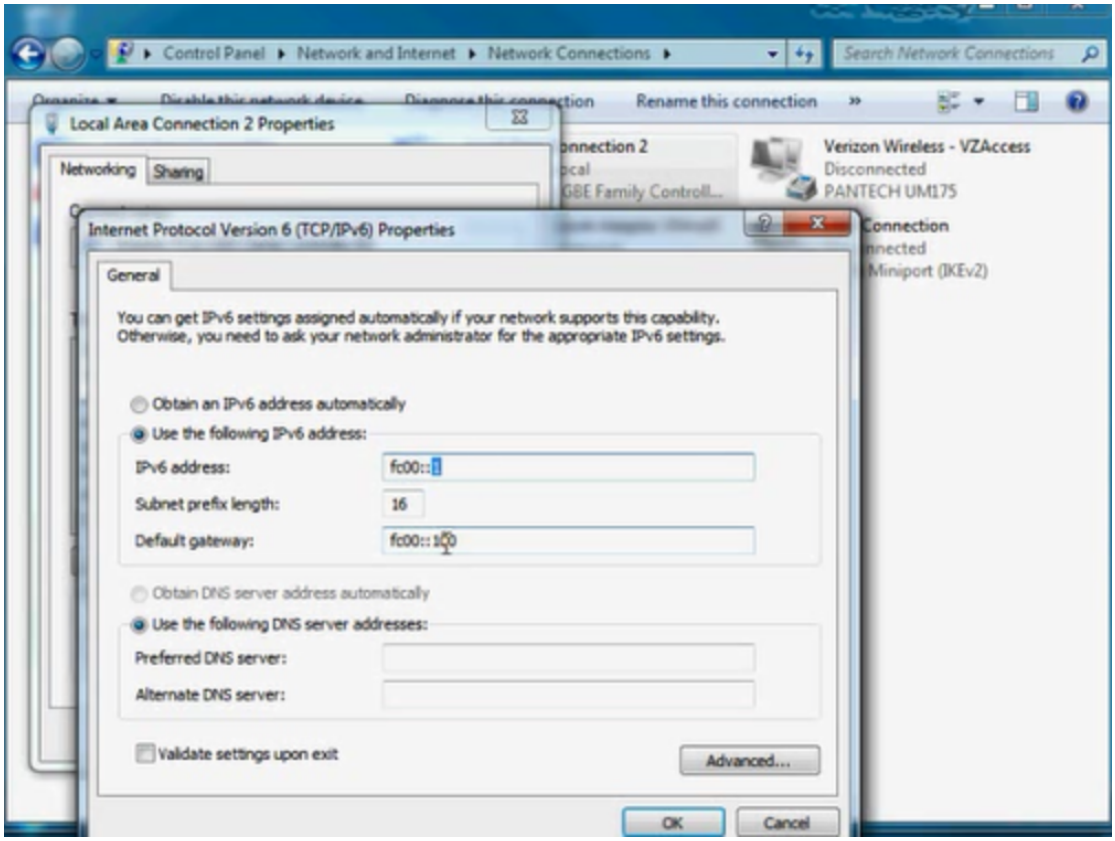
- "TRANSITION RICHNESS" ✓
- DUAL IP LAYER ✓
- DUAL-STACK ROUTERS
- TUNNELING (6TO4, 4TO6)
- NAT PROTOCOL TRANSLATION (NAT-PT)
- TEREDO – SENDS IPV6 PACKETS AS IPV4 UDP TO RESOLVE IPV4 NAT ISSUES

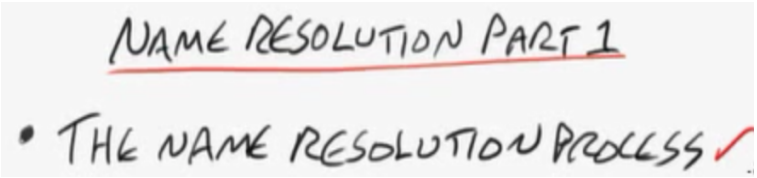
IPV6 :: w.x.y.z IPV4

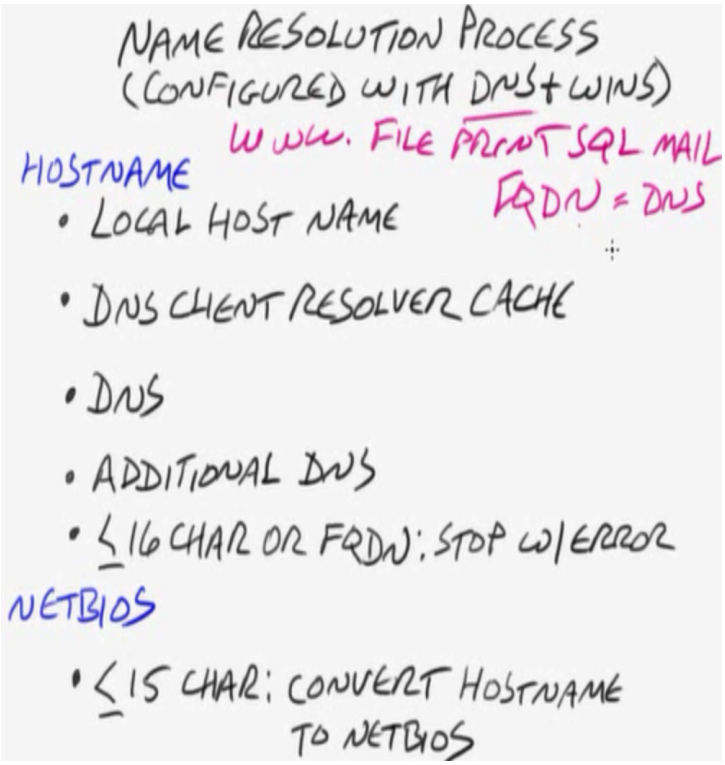
- ISATAP ✓ IPV6 — R — IPV4
  - PRIVATE NETWORK ✓
  - IPV6 OVER IPV4 TUNNELING ✓
  - IPV4 EMBEDDED IN IPV6 ✓

  e.g., FE00::5EFE:192.168.1.5

->ISATAP=Intra site automatic tunnel addressing protocol





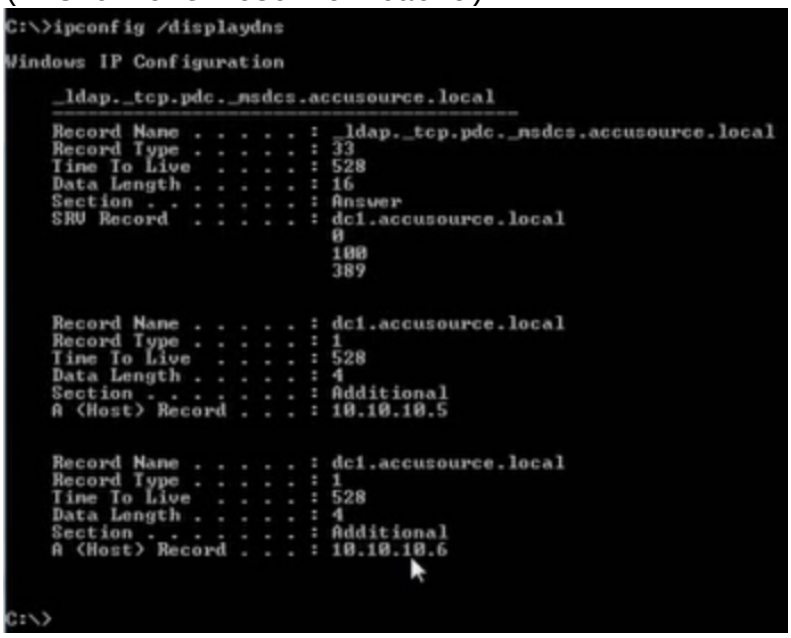


->DNS(Domain Name Services)

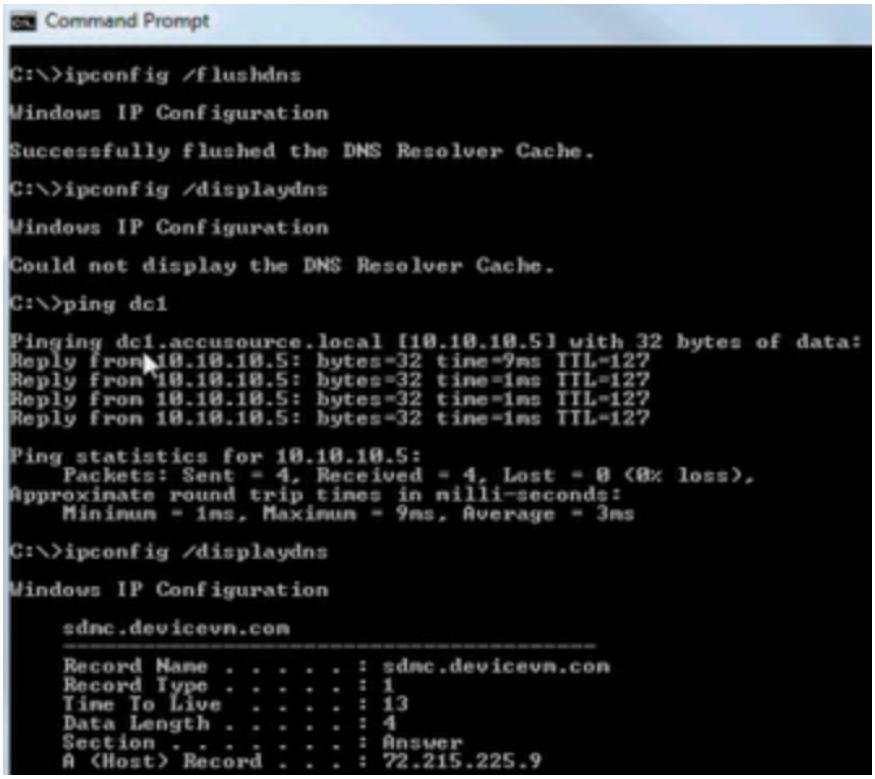
->nslookup www.google.com

->FQDN(FUlly Qualified Domain Name)(www.google.com)
(local hostname)

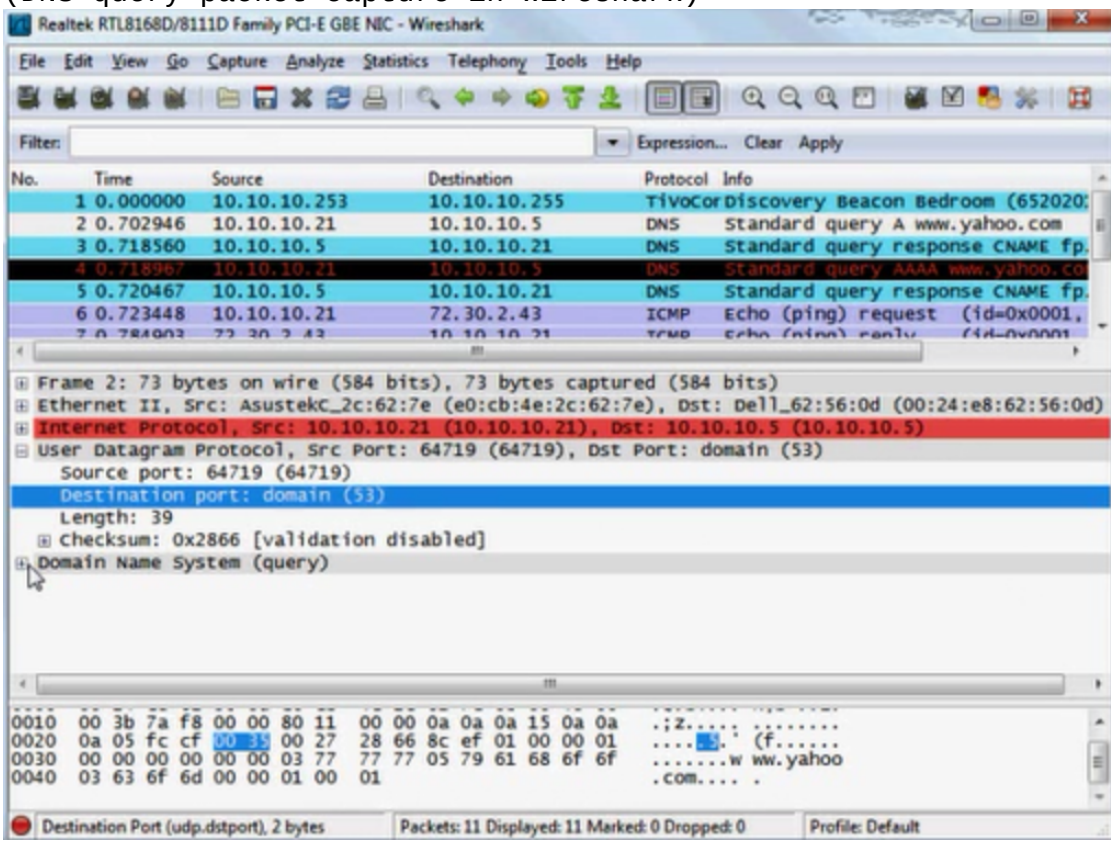
(DNS Client Resolver Cache)



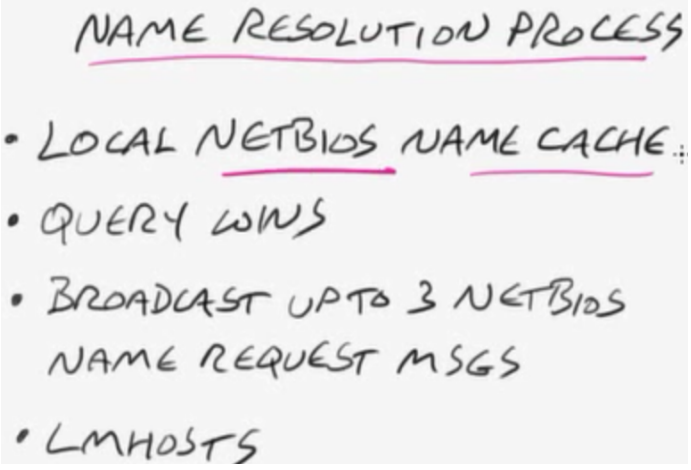
(Clearing local DNS Cache)



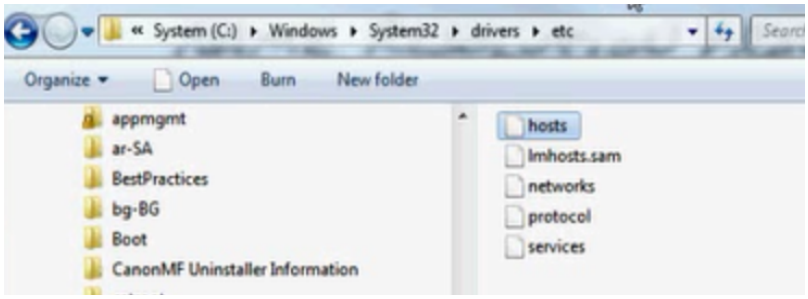
(DNS query packet capture in wireshark)

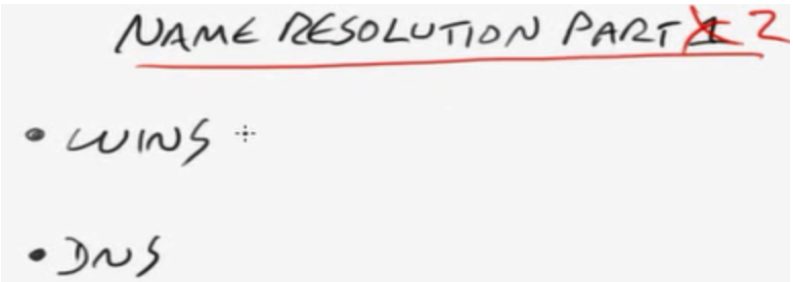


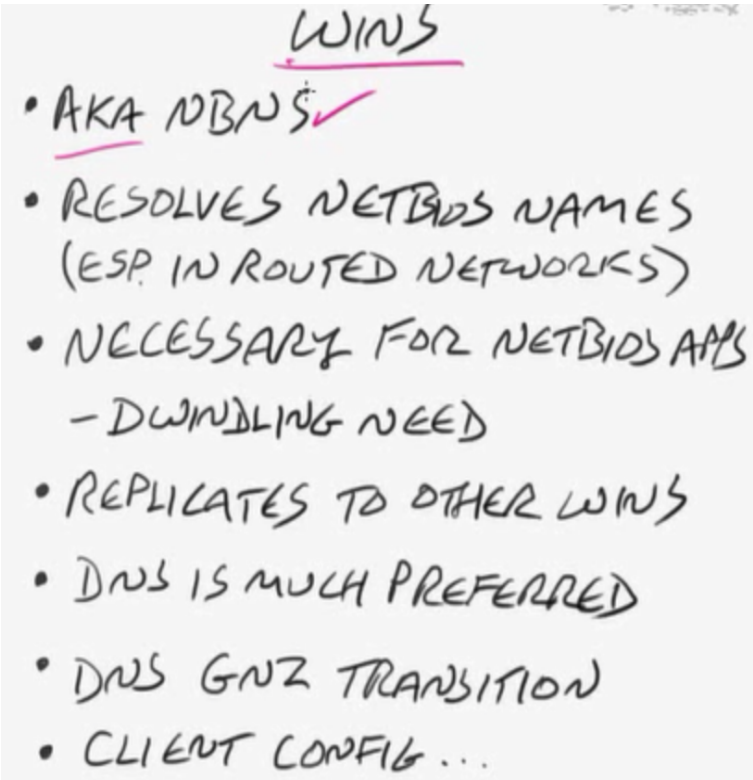
->SLN(Single Lable Name)



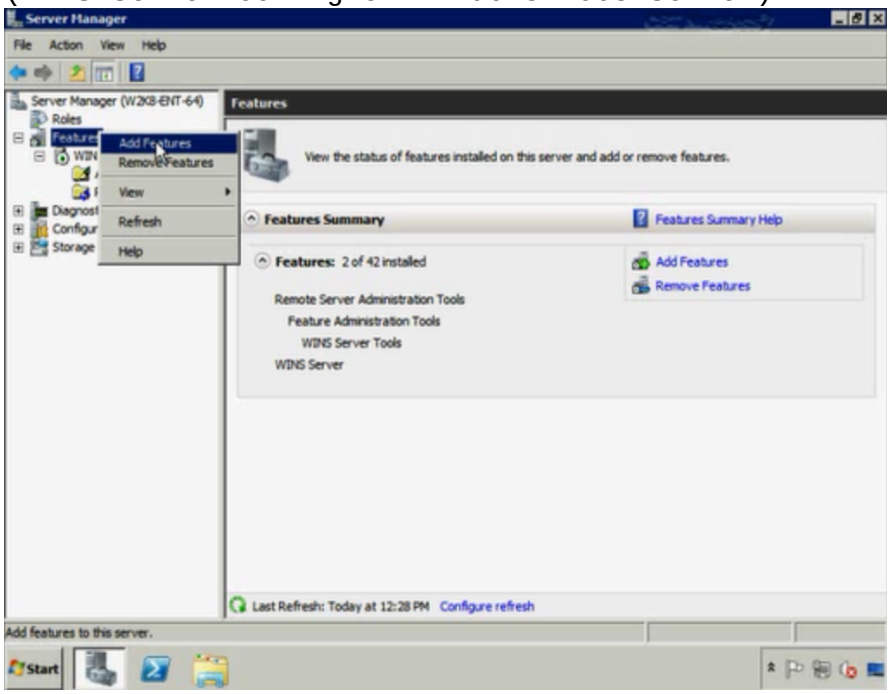
(LMHOST file)
->lmhosts.sam
->file used to pre-load common resolutions that you need available to the client all the time

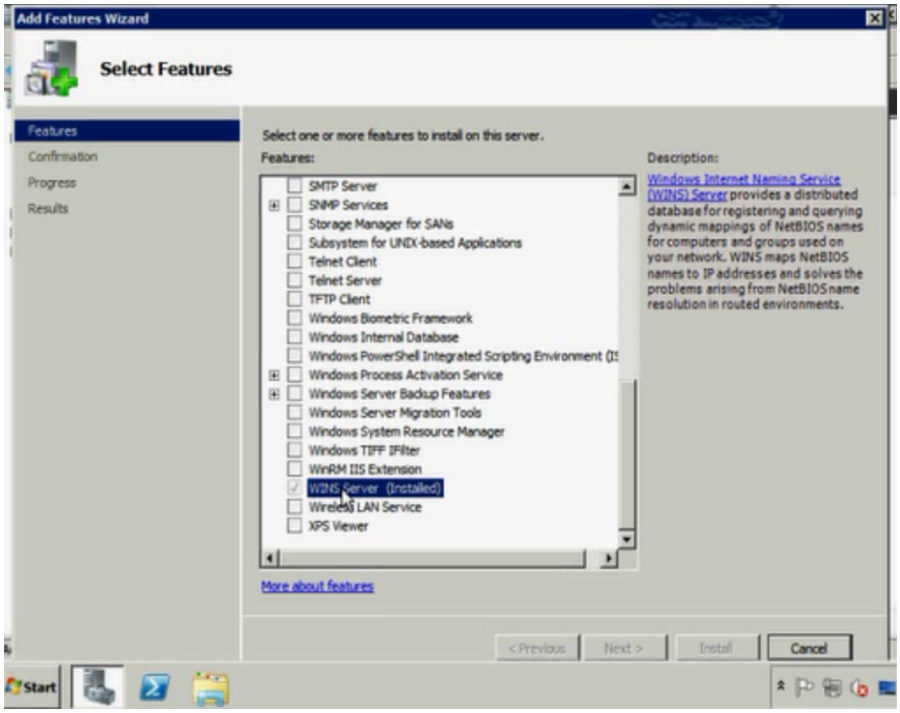


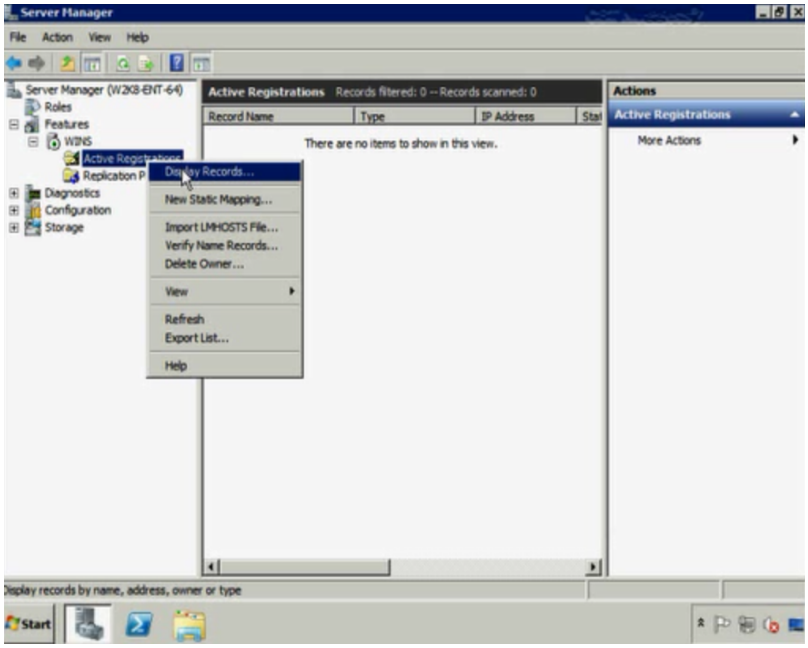


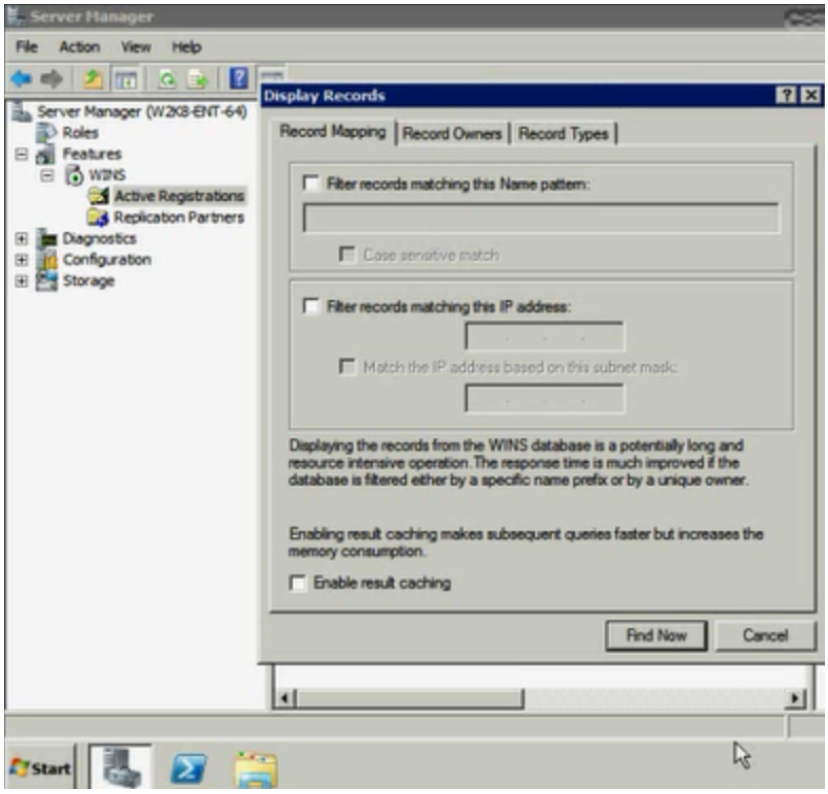


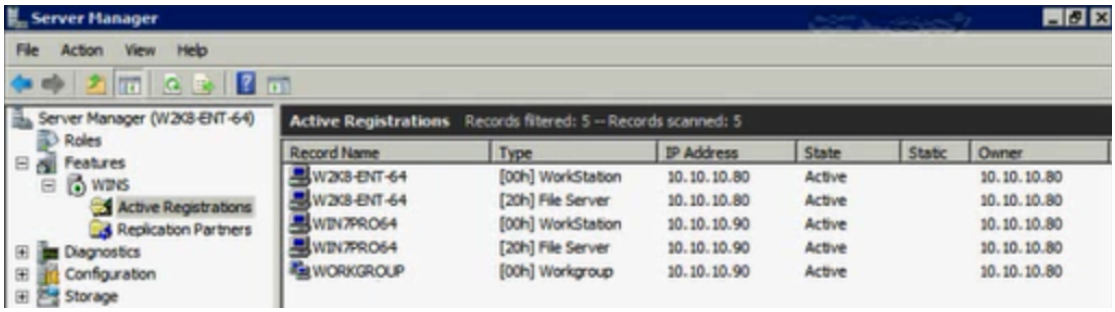
->WINS=NBNS=NetBIOS Name Server
->WINS is decremented
->GNZ(Global Name Zone)
(WINS server config on windows 2008 server)

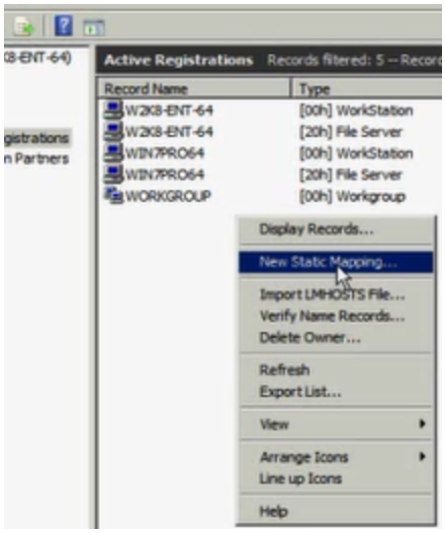


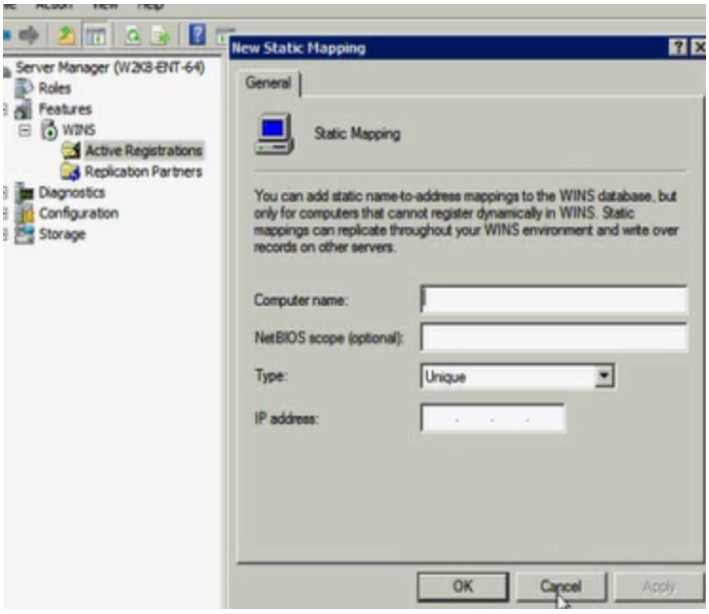

Add Features Wizard
Select Features
Features
Confirmation
Progress
Results
Select one or more features to install on this server.
Features:
SMTP Server
SNMP Services
Storage Manager for SANs
Subsystem for UNIX-based Applications
Telnet Client
Telnet Server
TFTP Client
Windows Biometric Framework
Windows Internal Database
Windows PowerShell Integrated Scripting Environment (IS
Windows Process Activation Service
Windows Server Backup Features
Windows Server Migration Tools
Windows System Resource Manager
Windows TIFF IFilter
WinRM IIS Extension
WINS Server (Installed)
Wireless LAN Service
XPS Viewer
More about features
Description:
Windows Internet Naming Service (WINS) Server provides a distributed database for registering and querying dynamic mappings of NetBIOS names for computers and groups used on your network. WINS maps NetBIOS names to IP addresses and solves the problems arising from NetBIOS name resolution in routed environments.
< Previous
Next >
Install
Cancel
Start

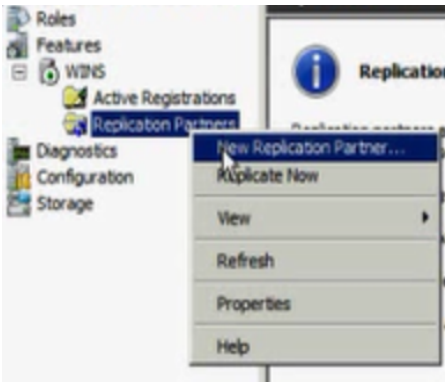

Server Manager
File
Action
View
Help
Server Manager (W2K8-ENT-64)
Roles
Features
WINS
Active Registrations
Replication P
Diagnostics
Configuration
Storage
Active Registrations Records filtered: 0 -- Records scanned: 0
Record Name
Type
IP Address
There are no items to show in this view.
Display Records...
New Static Mapping...
Import LMHOSTS File...
Verify Name Records...
Delete Owner...
View
Refresh
Export List...
Help
Actions
Active Registrations
More Actions
Display records by name, address, owner or type
Start

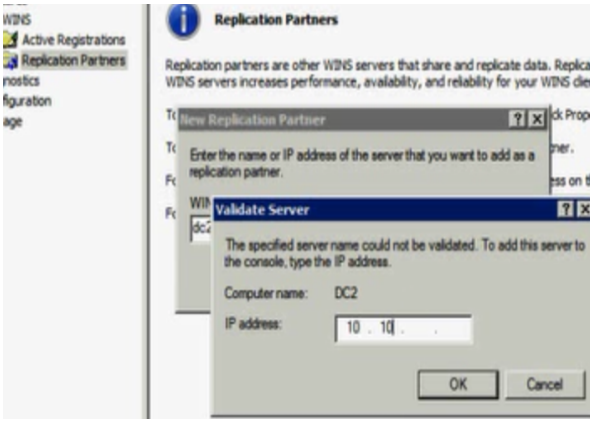

Server Manager
File Action View Help
Server Manager (W2K8-ENT-64)
Roles
Features
WINS
Active Registrations
Replication Partners
Diagnostics
Configuration
Storage
Display Records
Record Mapping
Record Owners
Record Types
Filter records matching this Name pattern:
Case sensitive match
Filter records matching this IP address:
Match the IP address based on this subnet mask:
Displaying the records from the WINS database is a potentially long and resource intensive operation. The response time is much improved if the database is filtered either by a specific name prefix or by a unique owner.
Enabling result caching makes subsequent queries faster but increases the memory consumption.
Enable result caching
Find Now
Cancel
Start

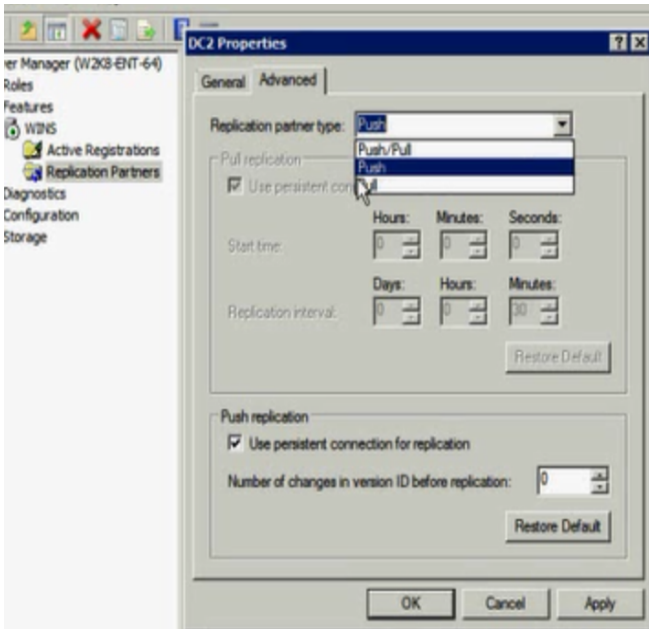

Server Manager
File Action View Help
Server Manager (W2K8-ENT-64)
Roles
Features
WINS
Active Registrations
Replication Partners
Diagnostics
Configuration
Storage
Active Registrations Records filtered: 5 -- Records scanned: 5
Record Name Type IP Address State Static Owner
W2K8-ENT-64 [00h] WorkStation 10.10.10.80 Active 10.10.10.80
W2K8-ENT-64 [20h] File Server 10.10.10.80 Active 10.10.10.80
WIN7PRO64 [00h] WorkStation 10.10.10.90 Active 10.10.10.80
WIN7PRO64 [20h] File Server 10.10.10.90 Active 10.10.10.80
WORKGROUP [00h] Workgroup 10.10.10.90 Active 10.10.10.80


Active Registrations Records filtered: 5 -- Record
Record Name Type
W2K8-ENT-64 [00h] WorkStation
W2K8-ENT-64 [20h] File Server
WIN7PRO64 [00h] WorkStation
WIN7PRO64 [20h] File Server
WORKGROUP [00h] Workgroup
Display Records...
New Static Mapping...
Import LMHOSTS File...
Verify Name Records...
Delete Owner...
Refresh
Export List...
View
Arrange Icons
Line up Icons
Help

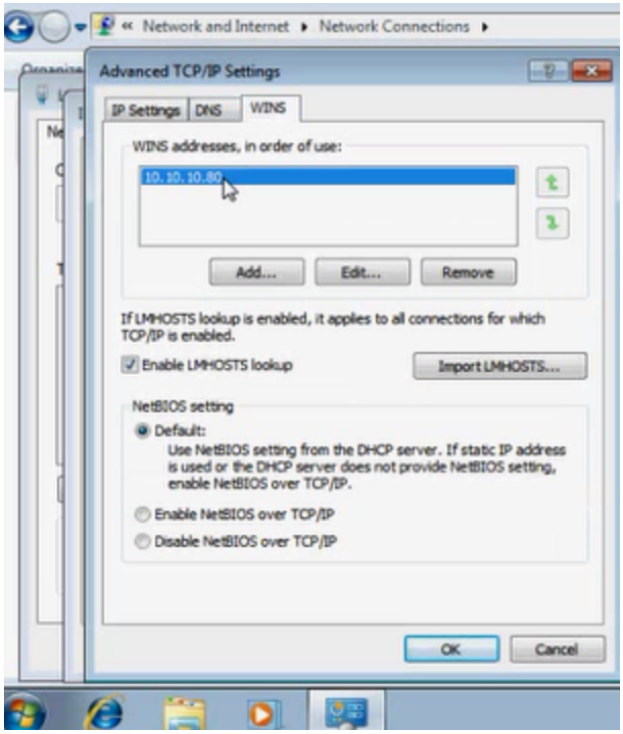

Server Manager (W2K8-ENT-64)
Roles
Features
WINS
Active Registrations
Replication Partners
Diagnostics
Configuration
Storage
New Static Mapping
General
Static Mapping
You can add static name-to-address mappings to the WINS database, but only for computers that cannot register dynamically in WINS. Static mappings can replicate throughout your WINS environment and write over records on other servers.
Computer name:
NetBIOS scope (optional):
Type:
Unique
IP address:
OK
Cancel
Apply

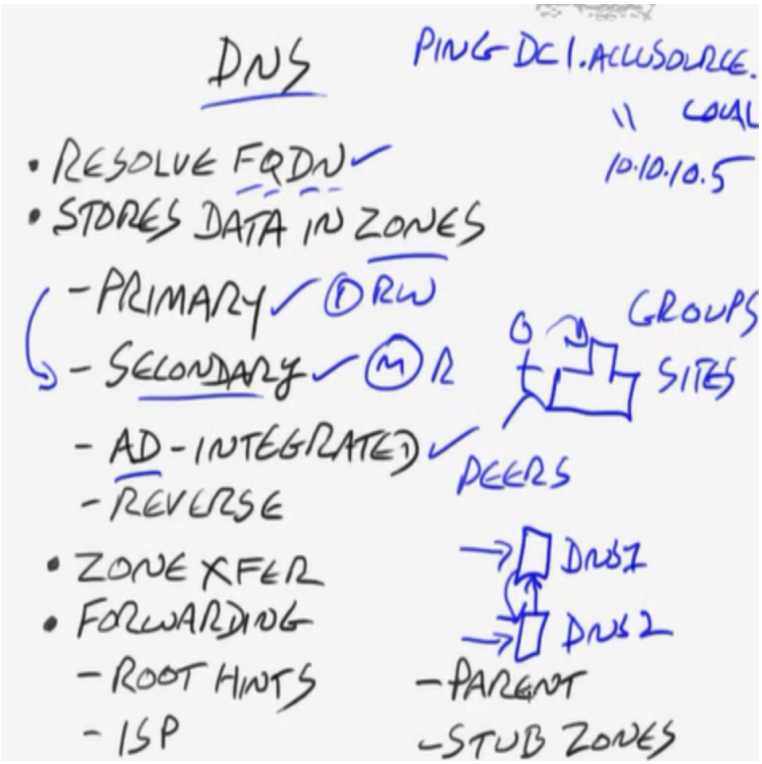

Roles
Features
WINS
Active Registrations
Replication Partners
Diagnostics
Configuration
Storage
New Replication Partner...
Replicate Now
View
Refresh
Properties
Help

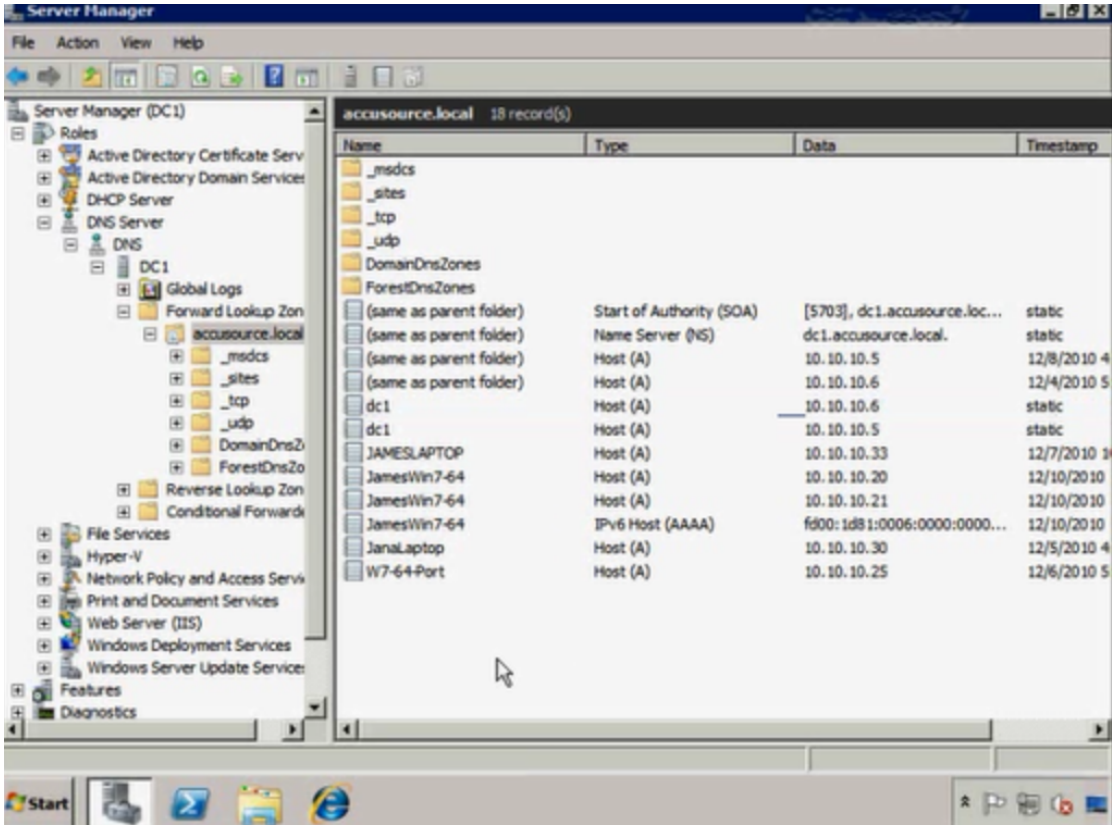

Active Registrations
Replication Partners
Replication Partners
Replication partners are other WINS servers that share and replicate data.
New Replication Partner
Enter the name or IP address of the server that you want to add as a replication partner.
Validate Server
The specified server name could not be validated. To add this server to the console, type the IP address.
Computer name:
DC2
IP address:
10 . 10
OK
Cancel

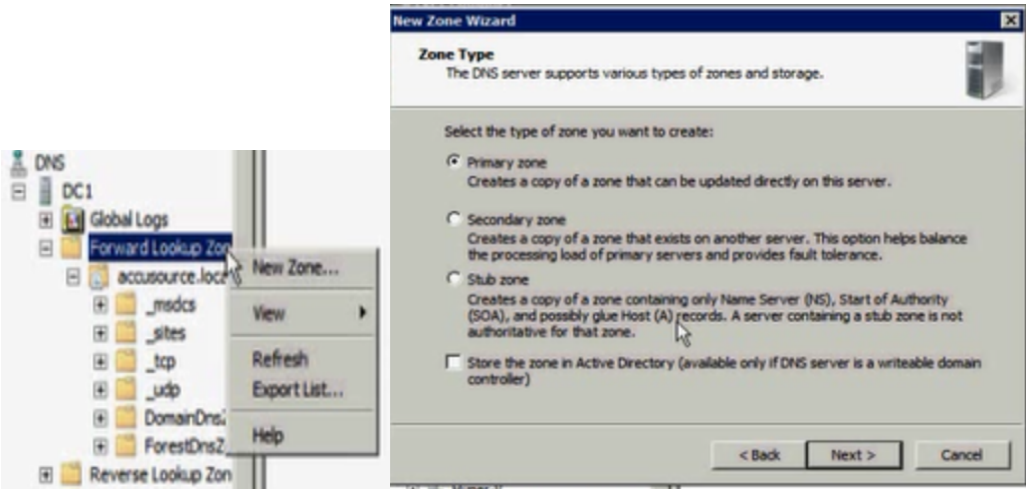


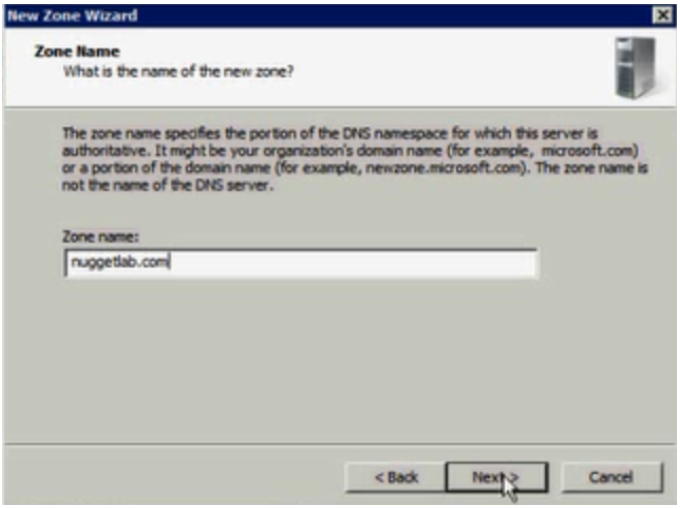
(Client WINS config)
->IPv6 does not use WINS at all

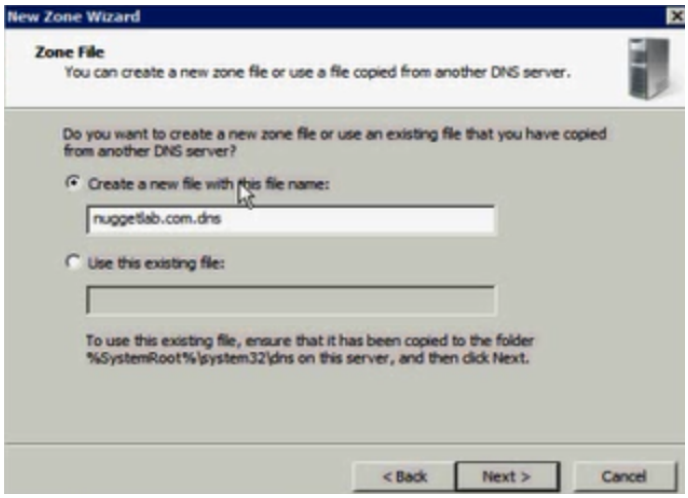


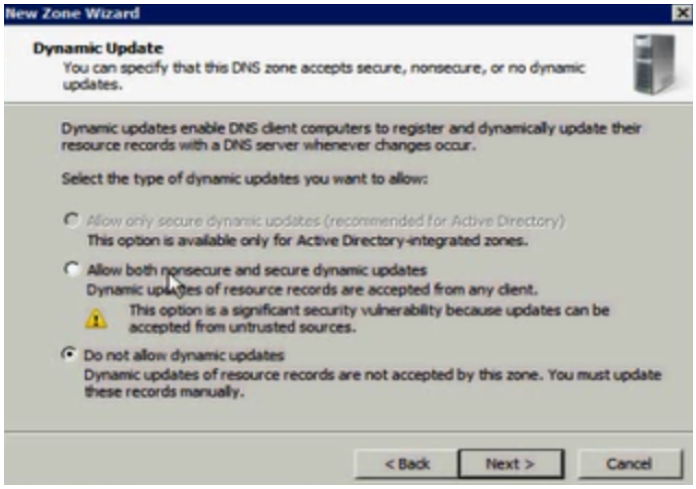

DNS
PING DC1.ACCUSOURCE.
LOCAL
10.10.10.5
• RESOLVE FQDN
• STORES DATA IN ZONES
- PRIMARY
RW
- SECONDARY
R
GROUPS
SITES
- AD-INTEGRATED
PEERS
- REVERSE
• ZONE XFER
• FORWARDING
DNS1
DNS2
- ROOT HINTS
- ISP
- PARENT
- STUB ZONES

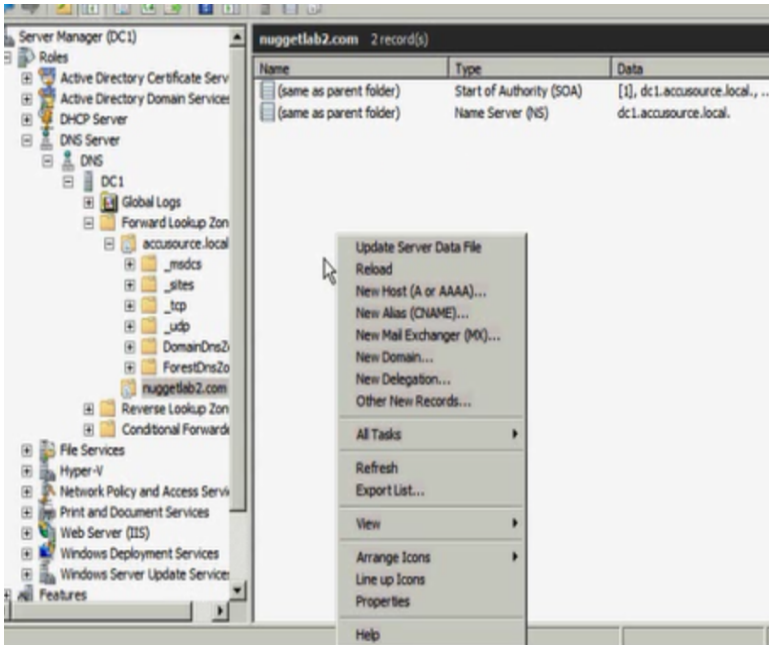

Server Manager
File Action View Help
Server Manager (DC1)
Roles
Active Directory Certificate Serv
Active Directory Domain Services
DHCP Server
DNS Server
DNS
DC1
Global Logs
Forward Lookup Zon
accusource.local
_msdcs
_sites
_tcp
_udp
DomainDnsZ
ForestDnsZo
Reverse Lookup Zon
Conditional Forward
File Services
Hyper-V
Network Policy and Access Servi
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Service
Features
Diagnostics
accusource.local 18 record(s)
Name Type Data Timestamp
_msdcs
_sites
_tcp
_udp
DomainDnsZones
ForestDnsZones
(same as parent folder) Start of Authority (SOA) [5703], dc1.accusource.loc... static
(same as parent folder) Name Server (NS) dc1.accusource.local. static
(same as parent folder) Host (A) 10.10.10.5 12/8/2010 4
(same as parent folder) Host (A) 10.10.10.6 12/4/2010 5
dc1 Host (A) 10.10.10.6 static
dc1 Host (A) 10.10.10.5 static
JAMESLAPTOP Host (A) 10.10.10.33 12/7/2010 1
JamesWin7-64 Host (A) 10.10.10.20 12/10/2010
JamesWin7-64 Host (A) 10.10.10.21 12/10/2010
JamesWin7-64 IPv6 Host (AAAA) fd00:1d81:0006:0000:0000... 12/10/2010
JanaLaptop Host (A) 10.10.10.30 12/5/2010 4
W7-64-Port Host (A) 10.10.10.25 12/6/2010 5
Start

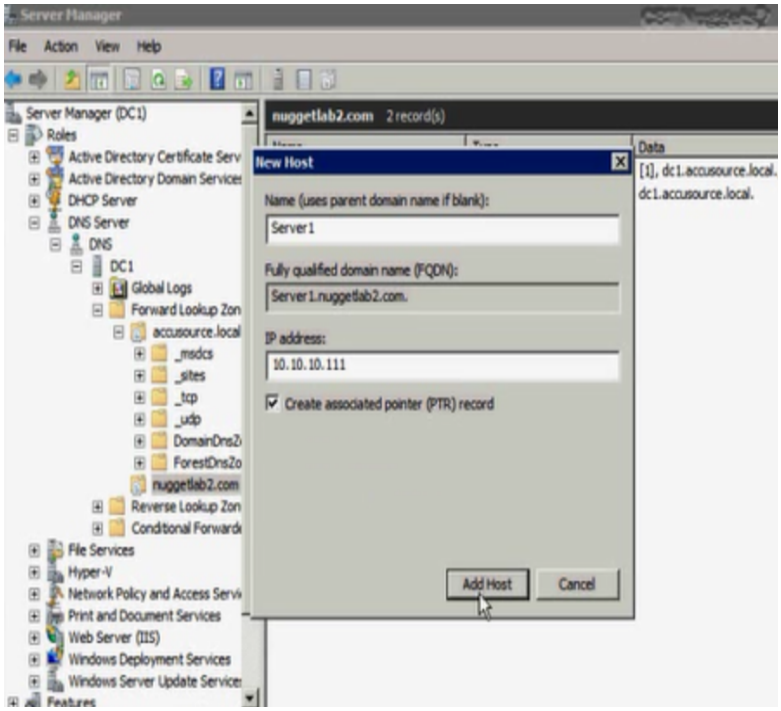

DNS
DC1
Global Logs
Forward Lookup Zon
accusource.local
_msdcs
_sites
_tcp
_udp
DomainDnsZ
ForestDnsZ
Reverse Lookup Zon
New Zone...
View
Refresh
Export List...
Help
New Zone Wizard
Zone Type
The DNS server supports various types of zones and storage.
Select the type of zone you want to create:
Primary zone
Creates a copy of a zone that can be updated directly on this server.
Secondary zone
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.
Stub zone
Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.
Store the zone in Active Directory (available only if DNS server is a writeable domain controller)
< Back
Next >
Cancel


New Zone Wizard
Zone Name
What is the name of the new zone?
The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.
Zone name:
nuggetlab.com
< Back
Next >
Cancel


New Zone Wizard
Zone File
You can create a new zone file or use a file copied from another DNS server.
Do you want to create a new zone file or use an existing file that you have copied from another DNS server?
Create a new file with this file name:
nuggetlab.com.dns
Use this existing file:
To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.
< Back
Next >
Cancel


New Zone Wizard
Dynamic Update
You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.
Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.
Select the type of dynamic updates you want to allow:
Allow only secure dynamic updates (recommended for Active Directory)
This option is available only for Active Directory-integrated zones.
Allow both nonsecure and secure dynamic updates
Dynamic updates of resource records are accepted from any client.
This option is a significant security vulnerability because updates can be accepted from untrusted sources.
Do not allow dynamic updates
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.
< Back
Next >
Cancel


Server Manager (DC1)
Roles
Active Directory Certificate Serv
Active Directory Domain Services
DHCP Server
DNS Server
DNS
DC1
Global Logs
Forward Lookup Zon
accusource.local
_msdcs
_sites
_tcp
_udp
DomainDnsZo
ForestDnsZo
nuggetlab2.com
Reverse Lookup Zon
Conditional Forward
File Services
Hyper-V
Network Policy and Access Serv
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Service
Features
nuggetlab2.com 2 record(s)
Name
Type
Data
(same as parent folder)
Start of Authority (SOA)
[1], dc1.accusource.local., ..
(same as parent folder)
Name Server (NS)
dc1.accusource.local.
Update Server Data File
Reload
New Host (A or AAAA)...
New Alias (CNAME)...
New Mail Exchanger (MX)...
New Domain...
New Delegation...
Other New Records...
All Tasks
Refresh
Export List...
View
Arrange Icons
Line up Icons
Properties
Help


Server Manager
File Action View Help
Server Manager (DC1)
Roles
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File Services
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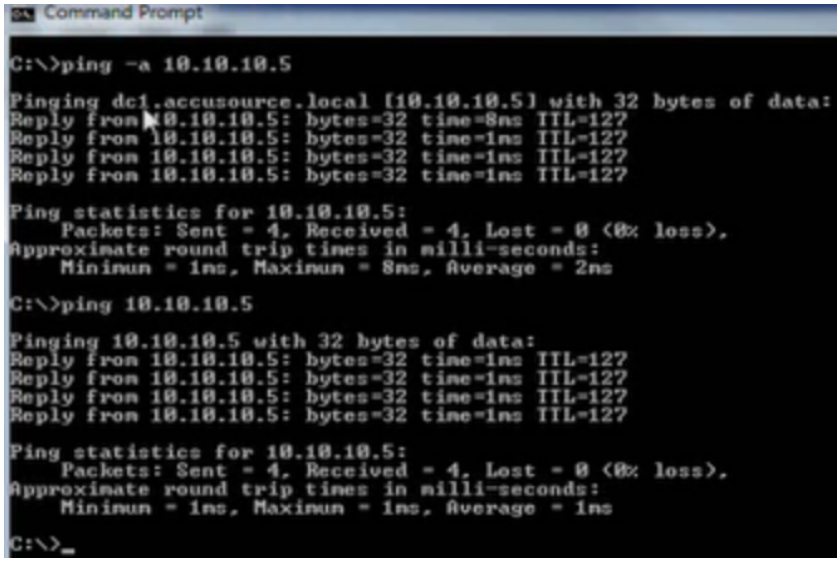
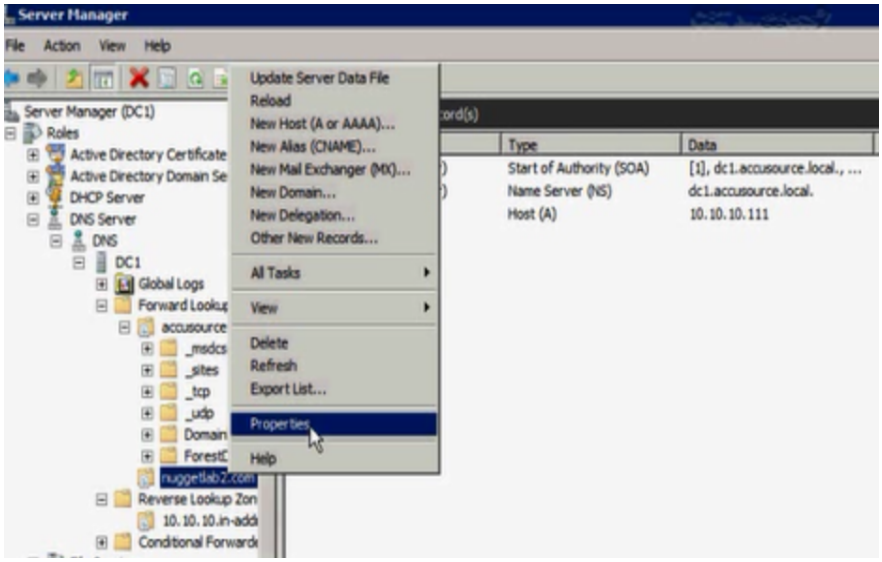
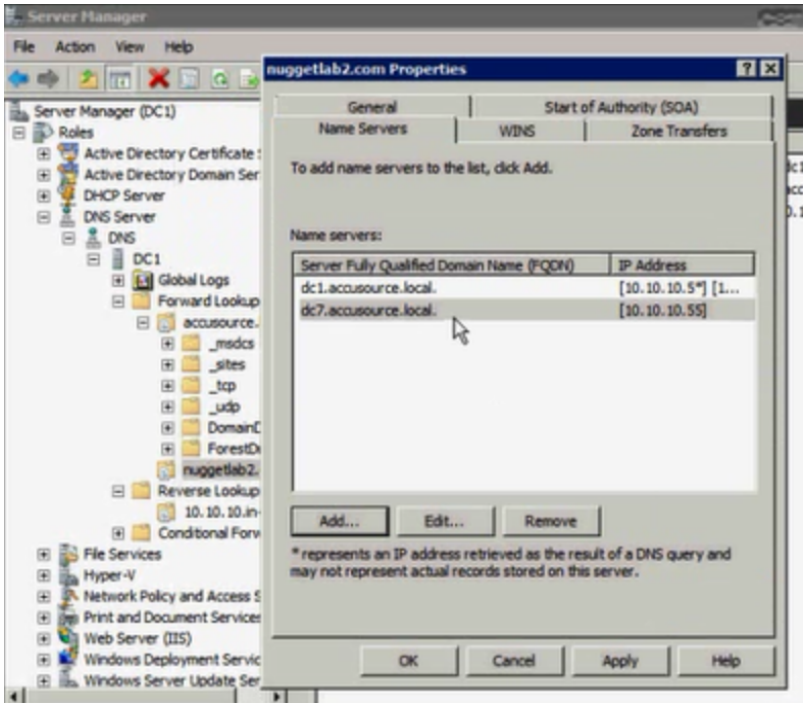
Network Policy and Access Servi
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services
Features
nuggetlab2.com 2 record(s)
Data
[1], dc1.accusource.local.
dc1.accusource.local.
New Host
Name (uses parent domain name if blank):
Server1
Fully qualified domain name (FQDN):
Server1.nuggetlab2.com.
IP address:
10.10.10.111
Create associated pointer (PTR) record
Add Host
Cancel


Command Prompt
C:\>ping -a 10.10.10.5
Pinging dc1.accusource.local [10.10.10.5] with 32 bytes of data:
Reply from 10.10.10.5: bytes=32 time=8ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Ping statistics for 10.10.10.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 8ms, Average = 2ms
C:\>ping 10.10.10.5
Pinging 10.10.10.5 with 32 bytes of data:
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Ping statistics for 10.10.10.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
C:\>_


Server Manager
File Action View Help
Server Manager (DC1)
Roles
Active Directory Certificate
Active Directory Domain Se
DHCP Server
DNS Server
DNS
DC1
Global Logs
Forward Lookup
accusource
_msdcs
_sites
_tcp
_udp
Domain
ForestD
nuggetlab2.com
Reverse Lookup Zon
10.10.10.in-addr
Conditional Forwarde
Update Server Data File
Reload
New Host (A or AAAA)...
New Alias (CNAME)...
New Mail Exchanger (MX)...
New Domain...
New Delegation...
Other New Records...
All Tasks
View
Delete
Refresh
Export List...
Properties
Help
Type
Data
Start of Authority (SOA)
[1], dc1.accusource.local., ...
Name Server (NS)
dc1.accusource.local.
Host (A)
10.10.10.111


Server Manager
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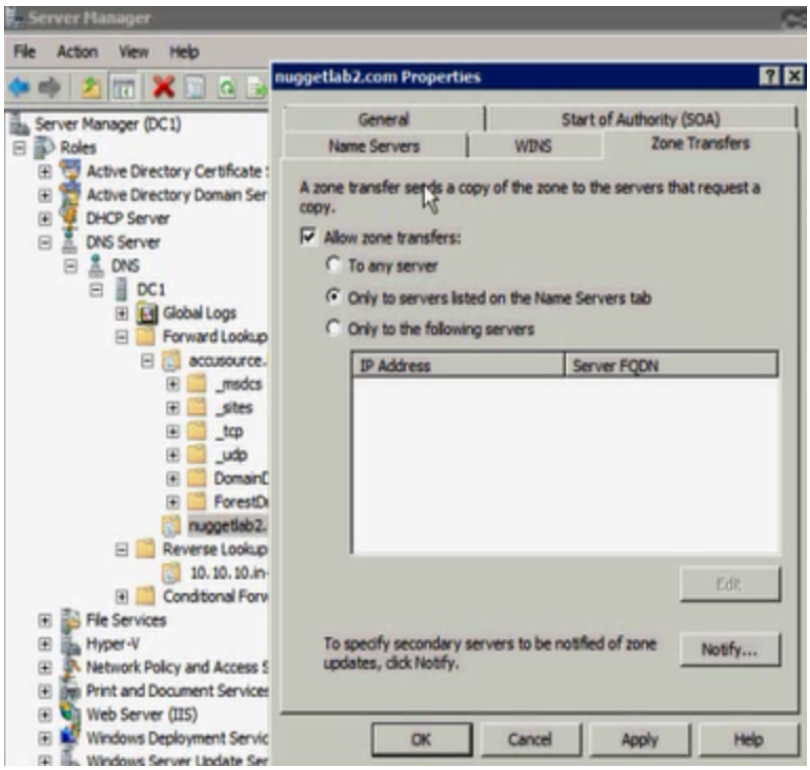
Server Manager (DC1)
Roles
Active Directory Certificate
Active Directory Domain Ser
DHCP Server
DNS Server
DNS
DC1
Global Logs
Forward Lookup
accusource.
_msdcs
_sites
_tcp
_udp
nuggetlab2.
Reverse Lookup
10.10.10.in-
Conditional Forw
File Services
Hyper-V
Network Policy and Access S
Print and Document Services
Web Server (IIS)
Windows Deployment Servic
Windows Server Update Ser
nuggetlab2.com Properties
General
Start of Authority (SOA)
Name Servers
WINS
Zone Transfers
To add name servers to the list, click Add.
Name servers:
Server Fully Qualified Domain Name (FQDN)
IP Address
dc1.accusource.local.
[10.10.10.5*] [1...
dc7.accusource.local.
[10.10.10.55]
Add...
Edit...
Remove
* represents an IP address retrieved as the result of a DNS query and may not represent actual records stored on this server.
OK
Cancel
Apply
Help


Server Manager
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Server Manager (DC1)
Roles
Active Directory Certificate
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_tcp
_udp
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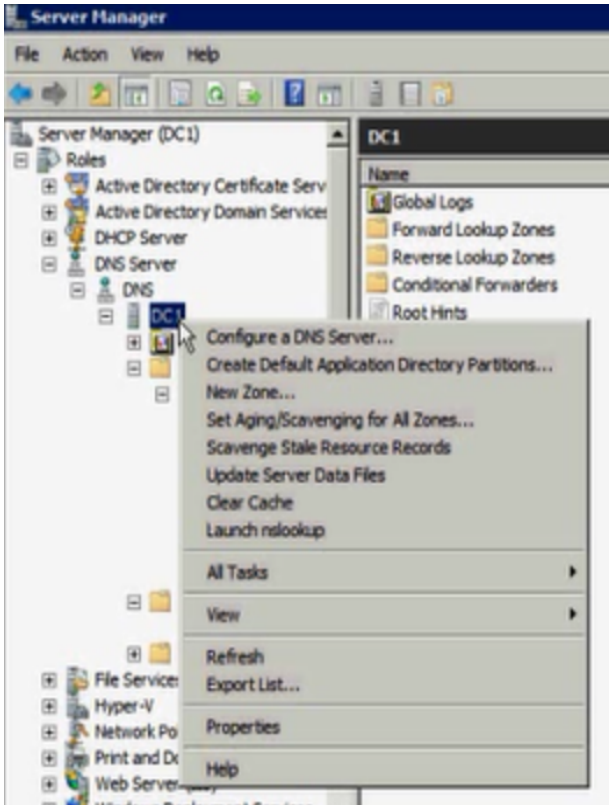
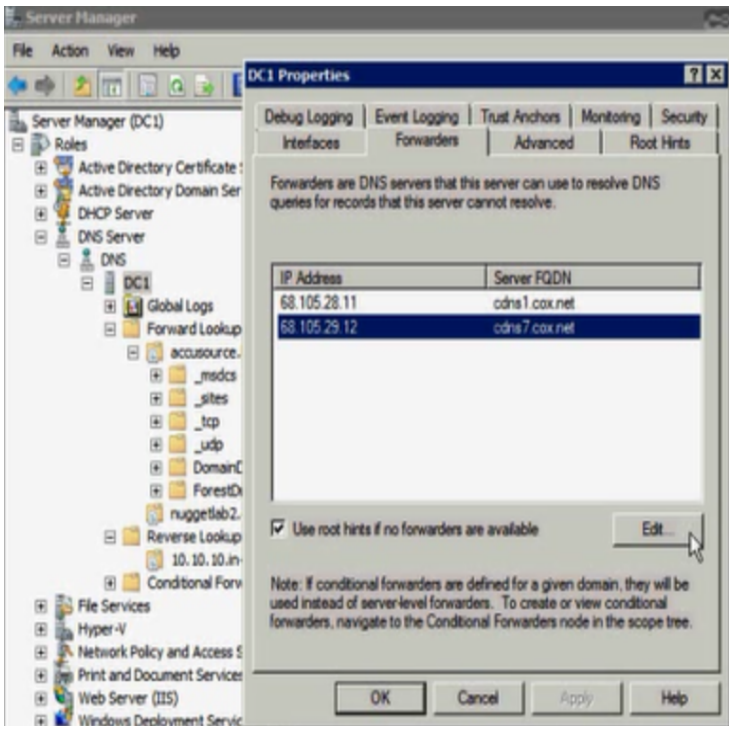
Reverse Lookup
10.10.10.in-
Conditional Forw
File Services
Hyper-V
Network Policy and Access S
Print and Document Services
Web Server (IIS)
Windows Deployment Servic
nuggetlab2.com Properties
General
Start of Authority (SOA)
Name Servers
WINS
Zone Transfers
A zone transfer sends a copy of the zone to the servers that request a copy.
Allow zone transfers:
To any server
Only to servers listed on the Name Servers tab
Only to the following servers
IP Address
Server FQDN
Edit
To specify secondary servers to be notified of zone updates, click Notify.
Notify...
OK
Cancel
Apply
Help


Server Manager
File Action View Help
Server Manager (DC1)
Roles
Active Directory Certificate Serv
Active Directory Domain Services
DHCP Server
DNS Server
DNS
DC1
DC1
Name
Global Logs
Forward Lookup Zones
Reverse Lookup Zones
Conditional Forwarders
Root Hints
Configure a DNS Server...
Create Default Application Directory Partitions...
New Zone...
Set Aging/Scavenging for All Zones...
Scavenge Stale Resource Records
Update Server Data Files
Clear Cache
Launch nslookup
All Tasks
View
Refresh
Export List...
Properties
Help
File Services
Hyper-V
Network Po
Print and Do
Web Server


Server Manager
File Action View Help
DC1 Properties
Debug Logging
Event Logging
Trust Anchors
Monitoring
Security
Interfaces
Forwarders
Advanced
Root Hints
Forwarders are DNS servers that this server can use to resolve DNS queries for records that this server cannot resolve.
IP Address
Server FQDN
68.105.28.11
cdns1.cox.net
68.105.29.12
cdns7.cox.net
Use root hints if no forwarders are available
Edit...
Note: If conditional forwarders are defined for a given domain, they will be used instead of server-level forwarders. To create or view conditional forwarders, navigate to the Conditional Forwarders node in the scope tree.
OK
Cancel
Apply
Help
Server Manager (DC1)
Roles
DHCP Server
DNS Server
DNS
DC1
Global Logs
Forward Lookup
_msdcs
_sites
_tcp
_udp
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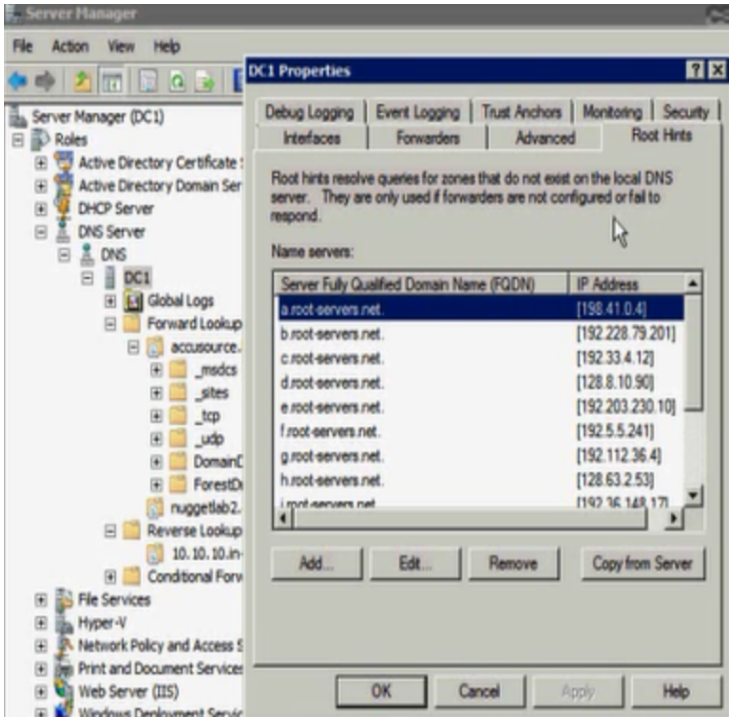
Conditional Forw
File Services
Hyper-V
Print and Document Services
Web Server (IIS)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_msdcs
_sites
_tcp
_udp
nuggetlab2.
Reverse Lookup
10.10.10.in-
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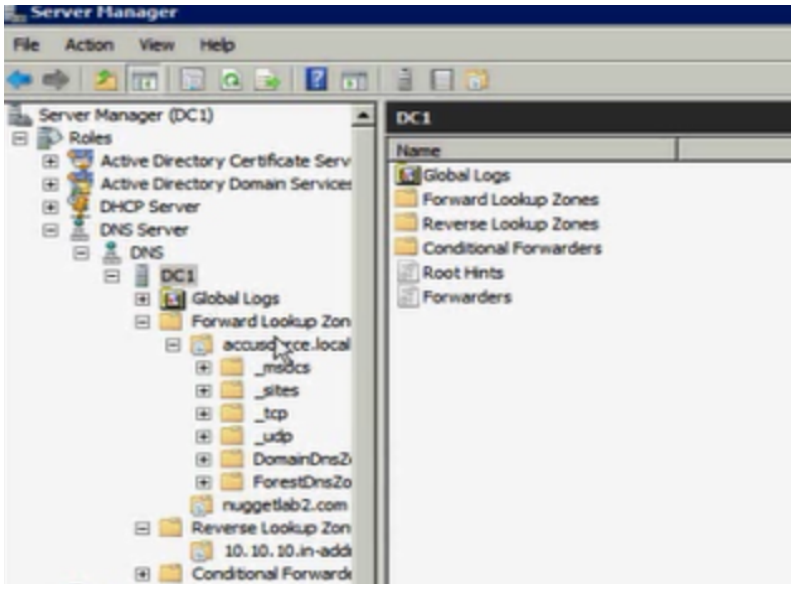
File Services
Hyper-V
Network Policy and Access S
Print and Document Services
Web Server (IIS)
DC1 Properties
Debug Logging
Event Logging
Trust Anchors
Monitoring
Security
Interfaces
Forwarders
Advanced
Root Hints
Root hints resolve queries for zones that do not exist on the local DNS server. They are only used if forwarders are not configured or fail to respond.
Name servers:
Server Fully Qualified Domain Name (FQDN)
IP Address
a.root-servers.net. [198.41.0.4]
b.root-servers.net. [192.228.79.201]
c.root-servers.net. [192.33.4.12]
d.root-servers.net. [128.8.10.90]
e.root-servers.net. [192.203.230.10]
f.root-servers.net. [192.5.5.241]
g.root-servers.net. [192.112.36.4]
h.root-servers.net. [128.63.2.53]
Add...
Edit...
Remove
Copy from Server
OK
Cancel
Apply
Help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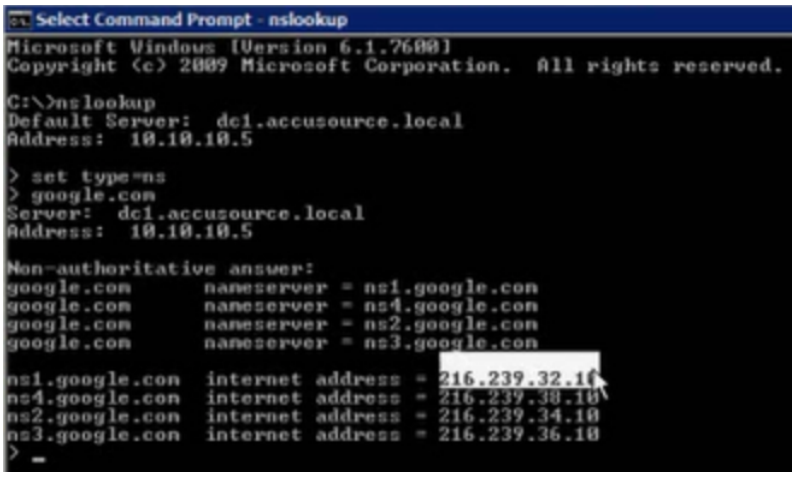
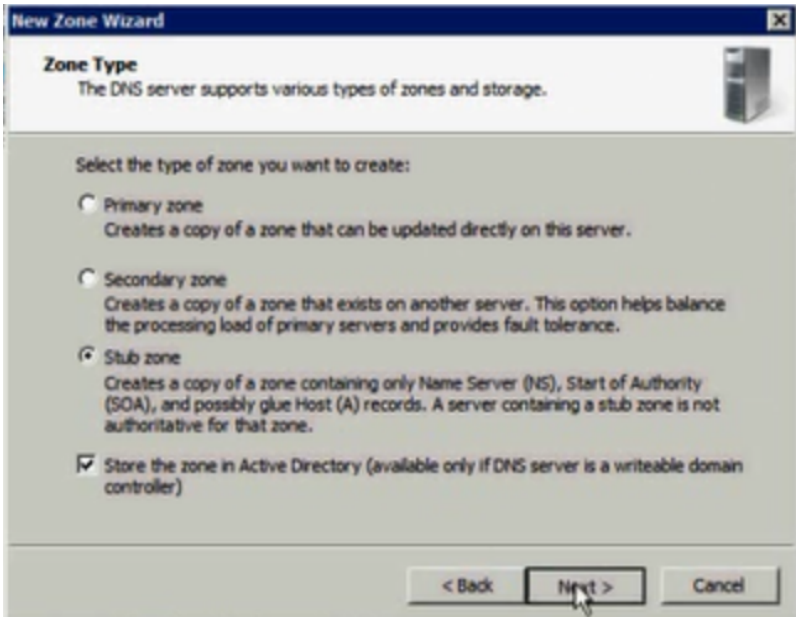
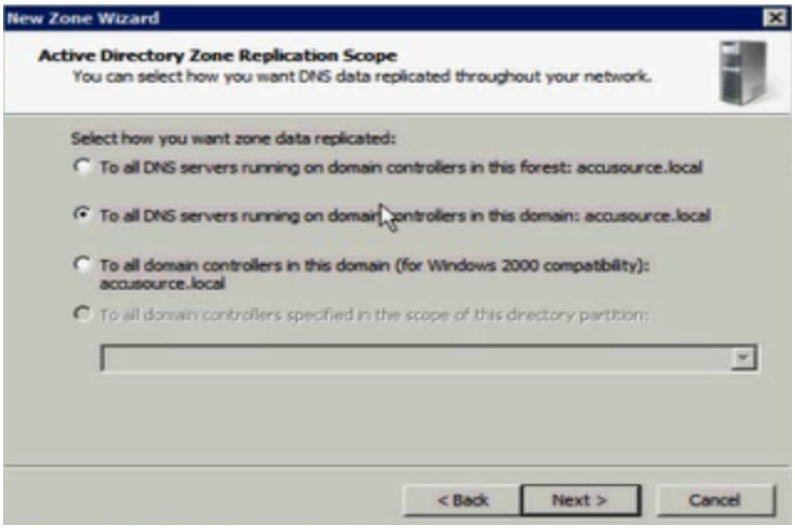
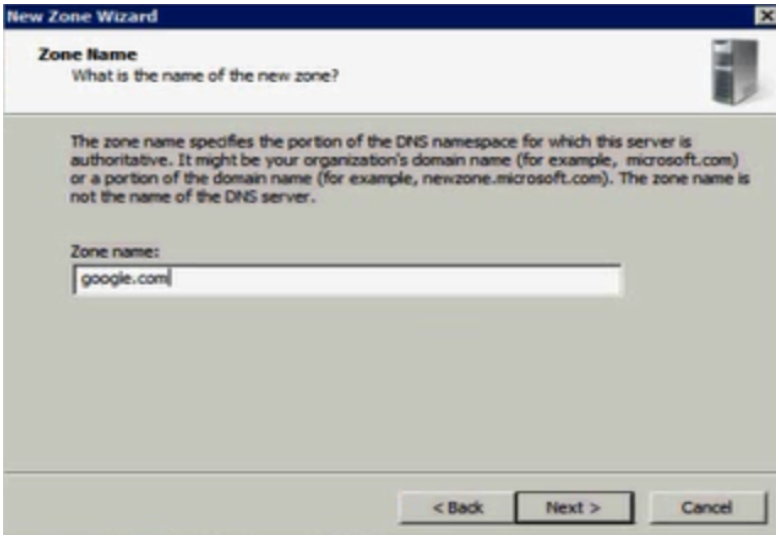
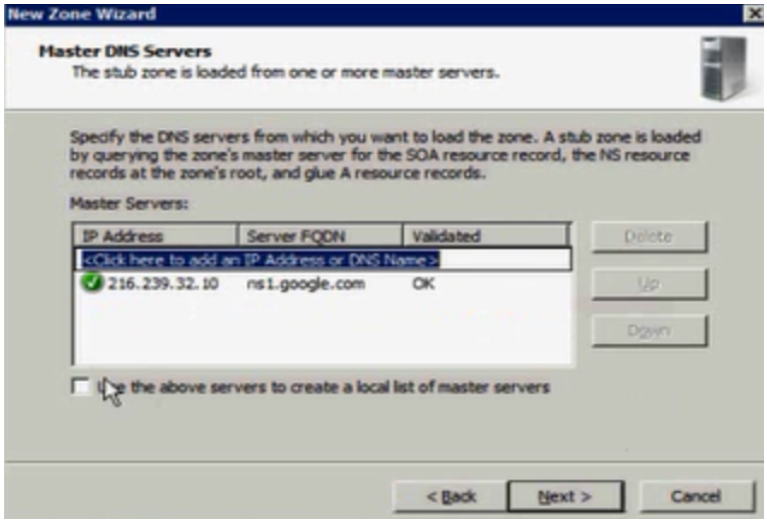
_tcp
_udp
DomainDnsZ
ForestDnsZo
nuggetlab2.com
Reverse Lookup Zon
10.10.10.in-addr
Conditional Forward
DC1
Name
Global Logs
Forward Lookup Zones
Reverse Lookup Zones
Conditional Forwarders
Root Hints
Forwarders

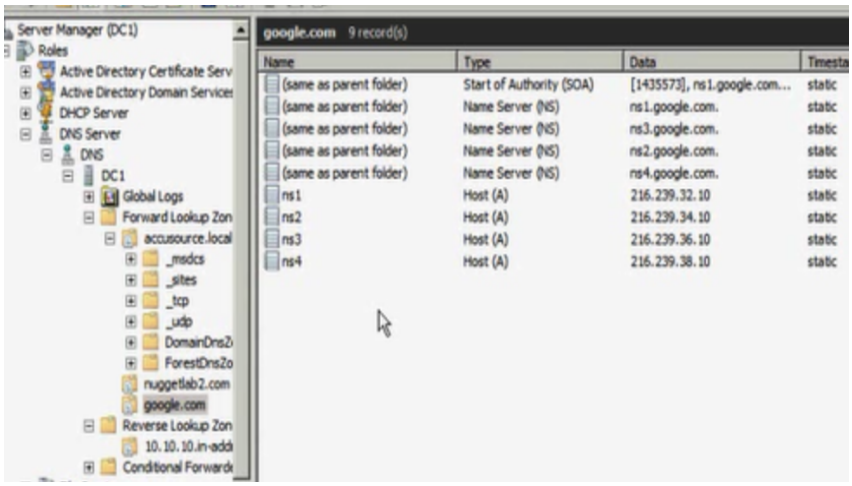

Select Command Prompt - nslookup
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\>nslookup
Default Server: dc1.accusource.local
Address: 10.10.10.5
> set type=ns
> google.com
Server: dc1.accusource.local
Address: 10.10.10.5
Non-authoritative answer:
google.com nameserver = ns1.google.com
google.com nameserver = ns4.google.com
google.com nameserver = ns2.google.com
google.com nameserver = ns3.google.com
ns1.google.com internet address = 216.239.32.10
ns4.google.com internet address = 216.239.38.10
ns2.google.com internet address = 216.239.34.10
ns3.google.com internet address = 216.239.36.10
> _


New Zone Wizard
Zone Type
The DNS server supports various types of zones and storage.
Select the type of zone you want to create:
Primary zone
Creates a copy of a zone that can be updated directly on this server.
Secondary zone
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.
Stub zone
Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.
Store the zone in Active Directory (available only if DNS server is a writeable domain controller)
< Back
Next >
Cancel


New Zone Wizard
Active Directory Zone Replication Scope
You can select how you want DNS data replicated throughout your network.
Select how you want zone data replicated:
To all DNS servers running on domain controllers in this forest: accusource.local
To all DNS servers running on domain controllers in this domain: accusource.local
To all domain controllers in this domain (for Windows 2000 compatibility): accusource.local
To all domain controllers specified in the scope of this directory partition:
< Back
Next >
Cancel


New Zone Wizard
Zone Name
What is the name of the new zone?
The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.
Zone name:
google.com
< Back
Next >
Cancel


New Zone Wizard
Master DNS Servers
The stub zone is loaded from one or more master servers.
Specify the DNS servers from which you want to load the zone. A stub zone is loaded by querying the zone's master server for the SOA resource record, the NS resource records at the zone's root, and glue A resource records.
Master Servers:
IP Address
Server FQDN
Validated
<Click here to add an IP Address or DNS Name>
216.239.32.10
ns1.google.com
OK
Delete
Up
Down
Use the above servers to create a local list of master servers
< Back
Next >
Cancel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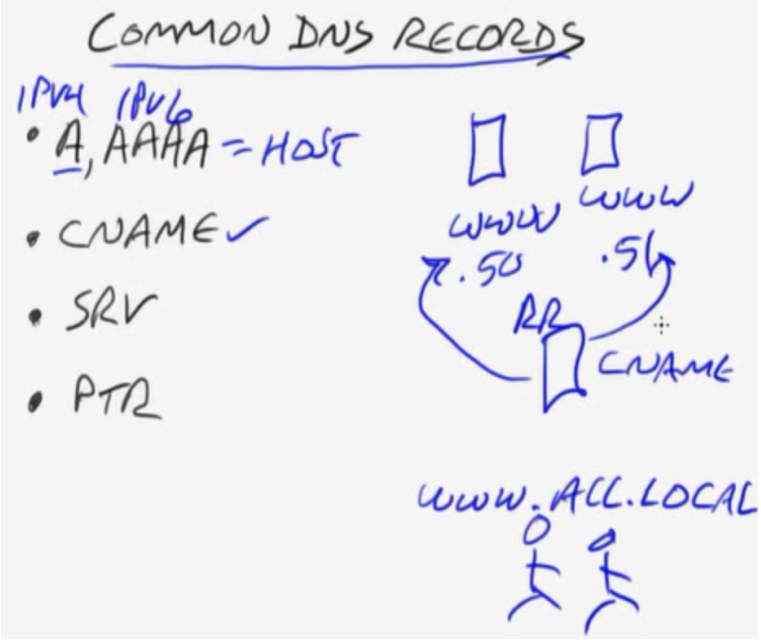
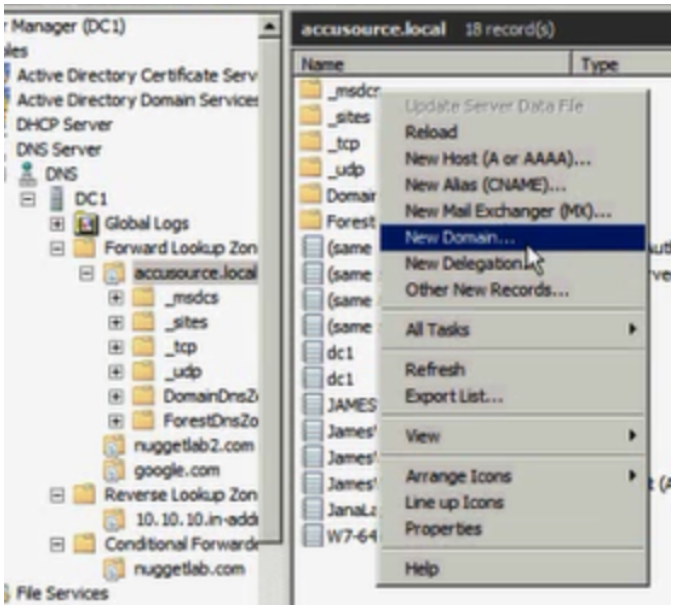
_tcp
_udp
DomainDnsZ
ForestDnsZo
nuggetlab2.com
google.com
Reverse Lookup Zon
10.10.10.in-addr
Conditional Forwarde
google.com 9 record(s)
Name
Type
Data
(same as parent folder) Start of Authority (SOA) [1435573], ns1.google.com... static
(same as parent folder) Name Server (NS) ns1.google.com. static
(same as parent folder) Name Server (NS) ns3.google.com. static
(same as parent folder) Name Server (NS) ns2.google.com. static
(same as parent folder) Name Server (NS) ns4.google.com. static
ns1 Host (A) 216.239.32.10 static
ns2 Host (A) 216.239.34.10 static
ns3 Host (A) 216.239.36.10 static
ns4 Host (A) 216.239.38.10 static


COMMON DNS RECORDS
IPV4 IPV6
• A, AAAA = HOST
• CNAME ✓
• SRV
• PTR
WWW .SU
WWW .SU
RR
CNAME
WWW.ACC.LOCAL


Manager (DC1)
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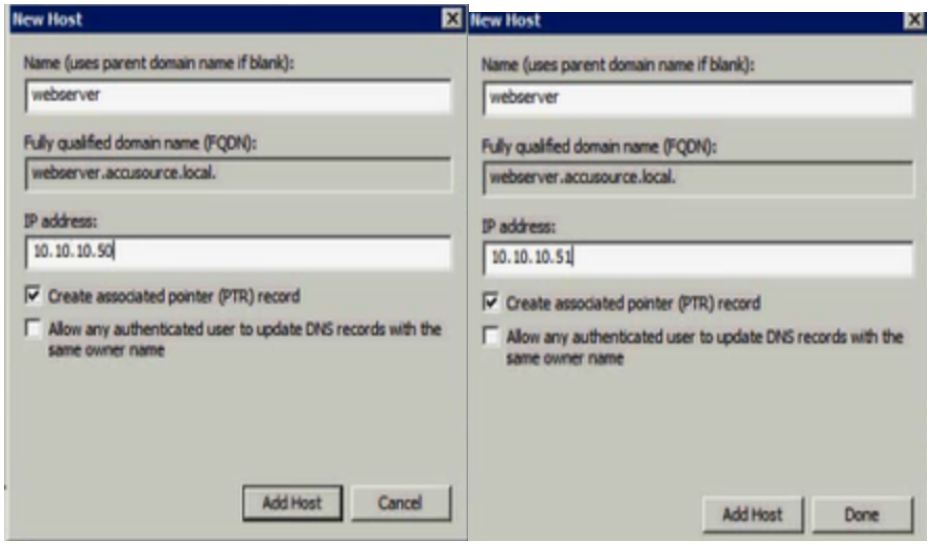
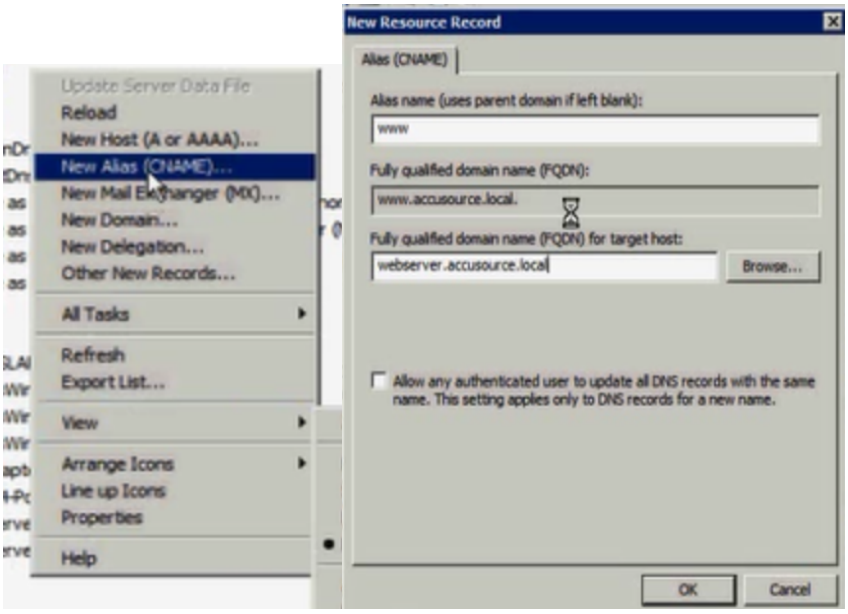
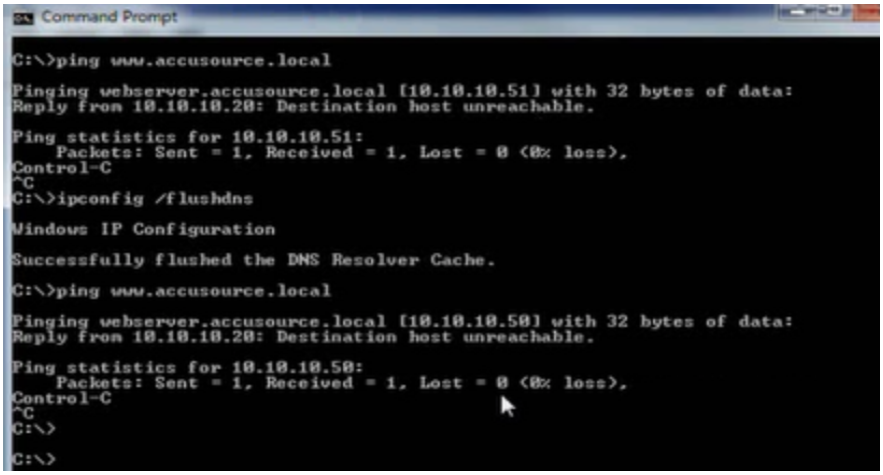
_tcp
_udp
nuggetlab2.com
google.com
Reverse Lookup Zon
10.10.10.in-addr
Conditional Forwarde
nuggetlab.com
File Services
accusource.local 18 record(s)
Name
Type
Update Server Data File
Reload
New Host (A or AAAA)...
New Alias (CNAME)...
New Mail Exchanger (MX)...
New Domain...
New Delegation...
Other New Records...
All Tasks
Refresh
Export List...
View
Arrange Icons
Line up Icons
Properties
Help


New Host
Name (uses parent domain name if blank):
webserver
Fully qualified domain name (FQDN):
webserver.accusource.local.
IP address:
10.10.10.50
Create associated pointer (PTR) record
Allow any authenticated user to update DNS records with the same owner name
Add Host
Cancel
New Host
Name (uses parent domain name if blank):
webserver
Fully qualified domain name (FQDN):
webserver.accusource.local.
IP address:
10.10.10.51
Create associated pointer (PTR) record
Allow any authenticated user to update DNS records with the same owner name
Add Host
Done


JamesWin7-64 IPv6 Host (AAAA) fd00:1d81:0006:0000:0000... 12/10/2010
JanaLaptop Host (A) 10.10.10.30 12/5/2010
W7-64-Port Host (A) 10.10.10.25 12/6/2010
webserver Host (A) 10.10.10.50
webserver Host (A) 10.10.10.51

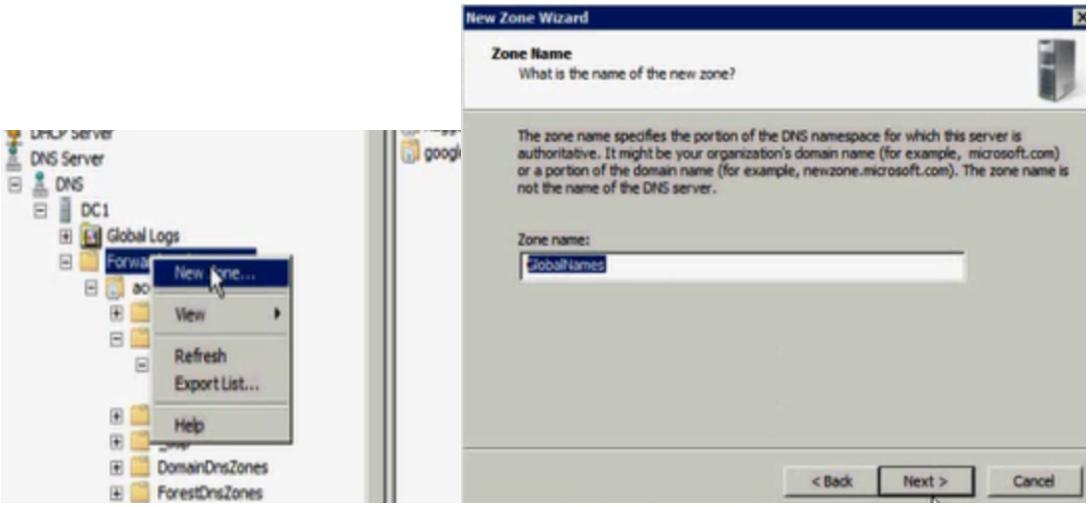

Update Server Data File
Reload
New Host (A or AAAA)...
New Alias (CNAME)...
New Mail Exchanger (MX)...
New Domain...
New Delegation...
Other New Records...
All Tasks
Refresh
Export List...
View
Arrange Icons
Line up Icons
Properties
Help
New Resource Record
Alias (CNAME)
Alias name (uses parent domain if left blank):
www
Fully qualified domain name (FQDN):
www.accusource.local.
Fully qualified domain name (FQDN) for target host:
webserver.accusource.local
Browse...
Allow any authenticated user to update all DNS records with the same name. This setting applies only to DNS records for a new name.
OK
Cancel

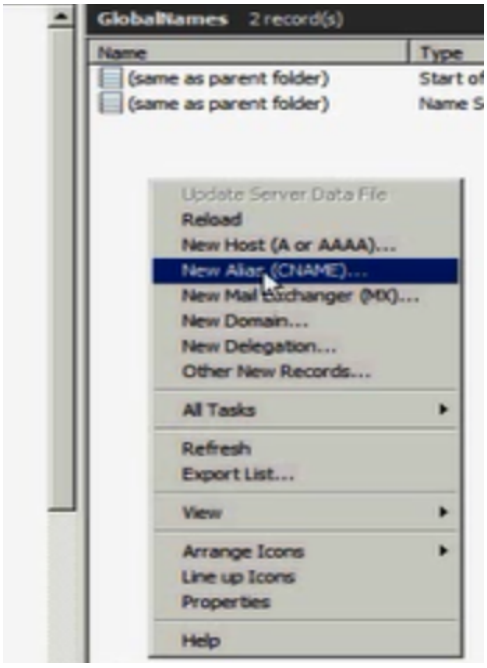

nuggetlab.com
webserver
Host (A)
10.10.10.50
webserver
Host (A)
10.10.10.51
www
Alias (CNAME)
webserver.accusource.local

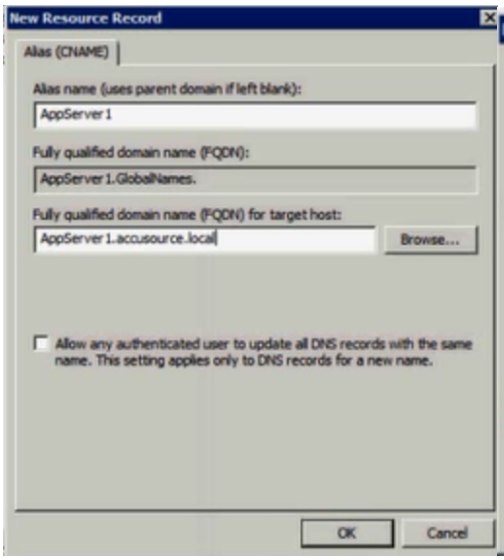

Command Prompt
C:\>ping www.accusource.local
Pinging webserver.accusource.local [10.10.10.51] with 32 bytes of data:
Reply from 10.10.10.20: Destination host unreachable.
Ping statistics for 10.10.10.51:
Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
Control-C
^C
C:\>ipconfig /flushdns
Windows IP Configuration
Successfully flushed the DNS Resolver Cache.
C:\>ping www.accusource.local
Pinging webserver.accusource.local [10.10.10.50] with 32 bytes of data:
Reply from 10.10.10.20: Destination host unreachable.
Ping statistics for 10.10.10.50:
Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
Control-C
^C
C:\>
C:\>

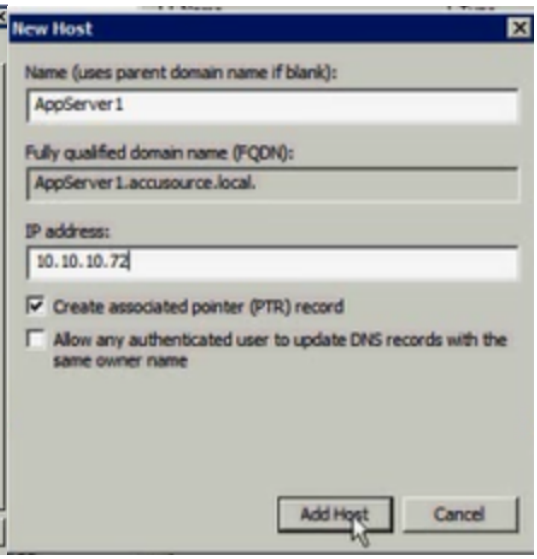
GLOBAL NAMES ZONE DNS

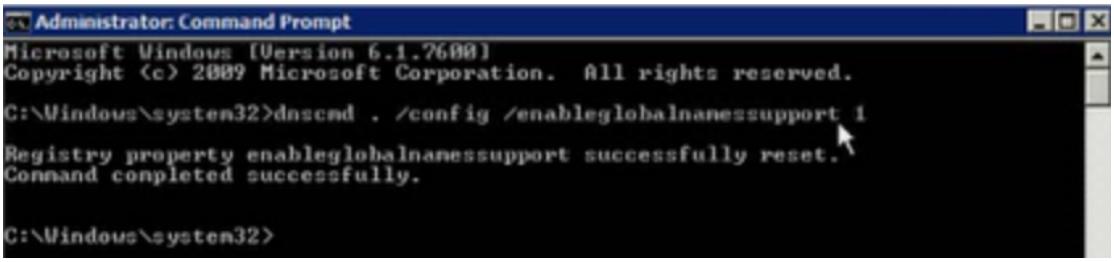
- WINS-NO IPV6
- GNZ-NOT DYNAMIC
- USE WHEN:
  - CLIENTS CANNOT USE FQDN
  - DNS SERVERS ARE W2K8
  - REGISTERING STATIC SERVERS
  - DECOMMISSIONING WINS

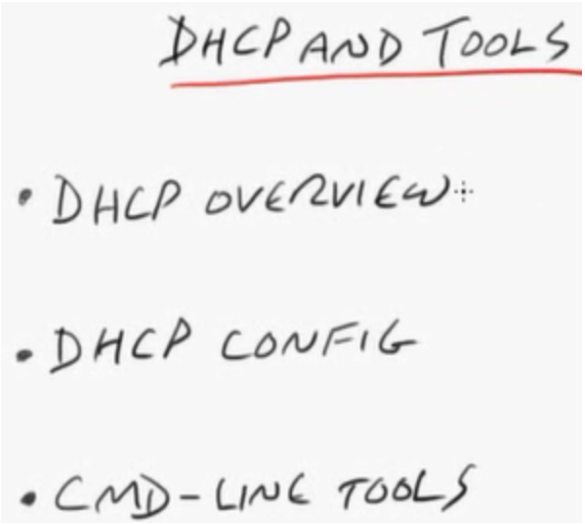


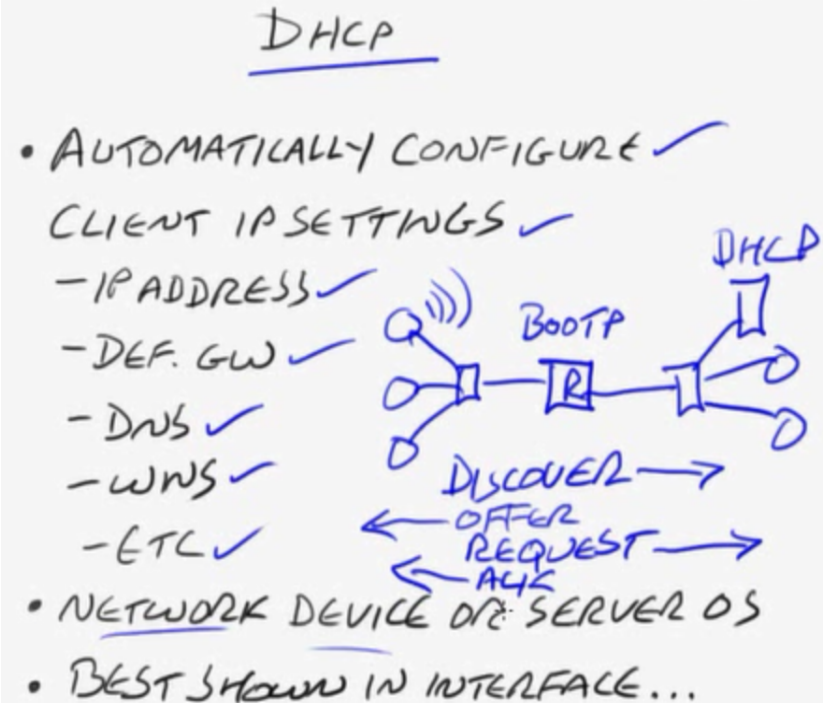

GlobalNames 2 record(s)
Name
Type
(same as parent folder)
(same as parent folder)
Update Server Data File
Reload
New Host (A or AAAA)...
New Alias (CNAME)...
New Mail Exchanger (MX)...
New Domain...
New Delegation...
Other New Records...
All Tasks
Refresh
Export List...
View
Arrange Icons
Line up Icons
Properties
Help


New Resource Record
Alias (CNAME)
Alias name (uses parent domain if left blank):
AppServer1
Fully qualified domain name (FQDN):
AppServer1.GlobalNames.
Fully qualified domain name (FQDN) for target host:
AppServer1.accusource.local
Browse...
Allow any authenticated user to update all DNS records with the same name. This setting applies only to DNS records for a new name.
OK
Cancel

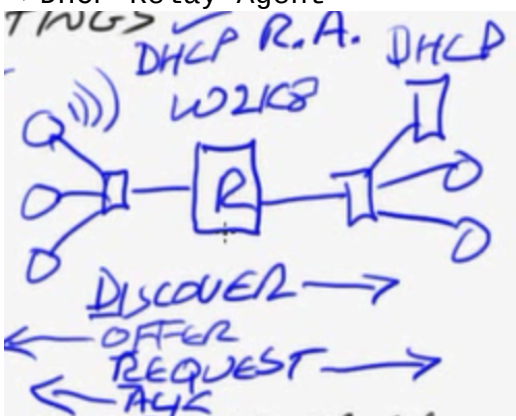

New Host
Name (uses parent domain name if blank):
AppServer1
Fully qualified domain name (FQDN):
AppServer1.accusource.local.
IP address:
10.10.10.72
Create associated pointer (PTR) record
Allow any authenticated user to update DNS records with the same owner name
Add Host
Cancel

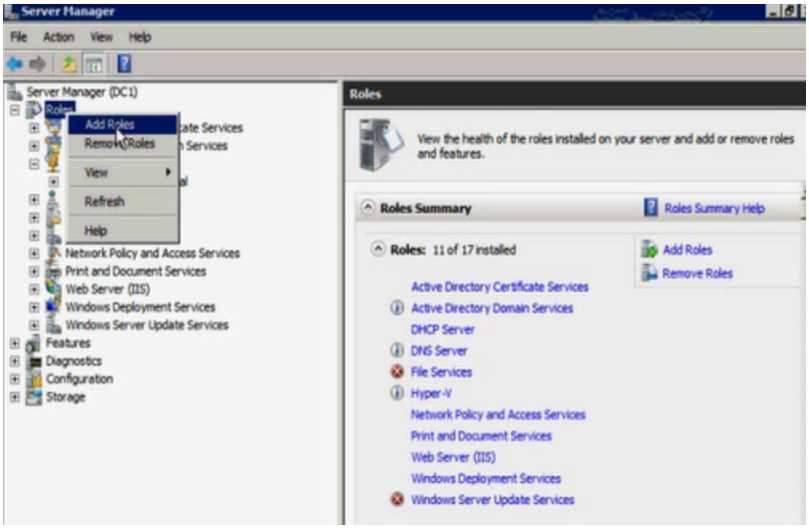

Administrator: Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Windows\system32>dnscmd . /config /enableglobalnamessupport 1
Registry property enableglobalnamessupport successfully reset.
Command completed successfully.
C:\Windows\system32>

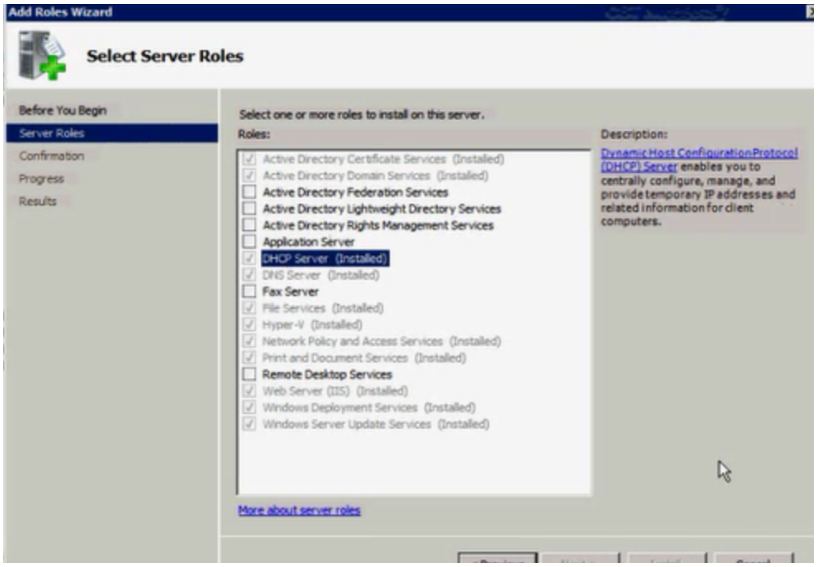


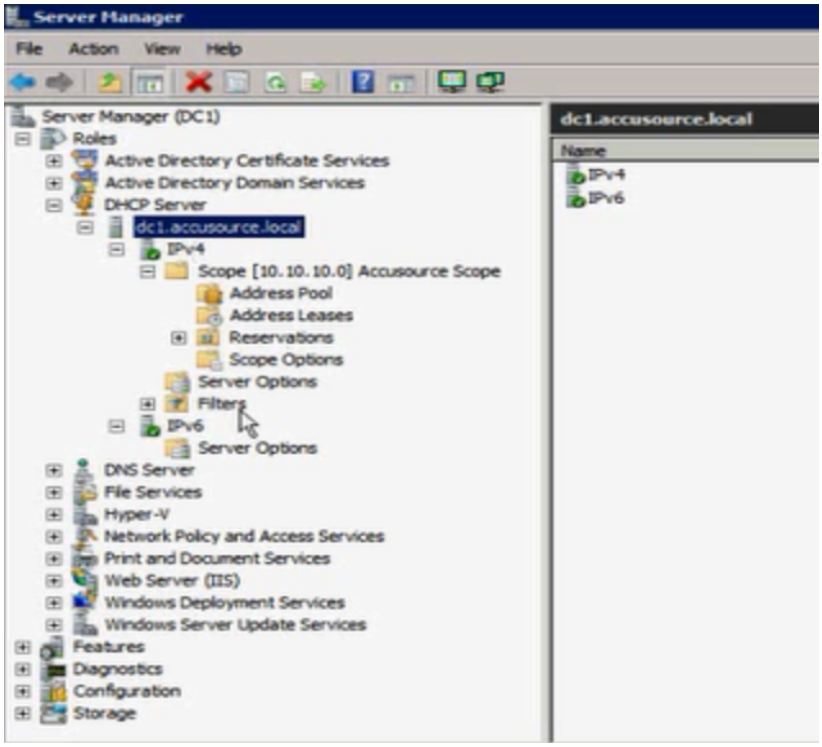


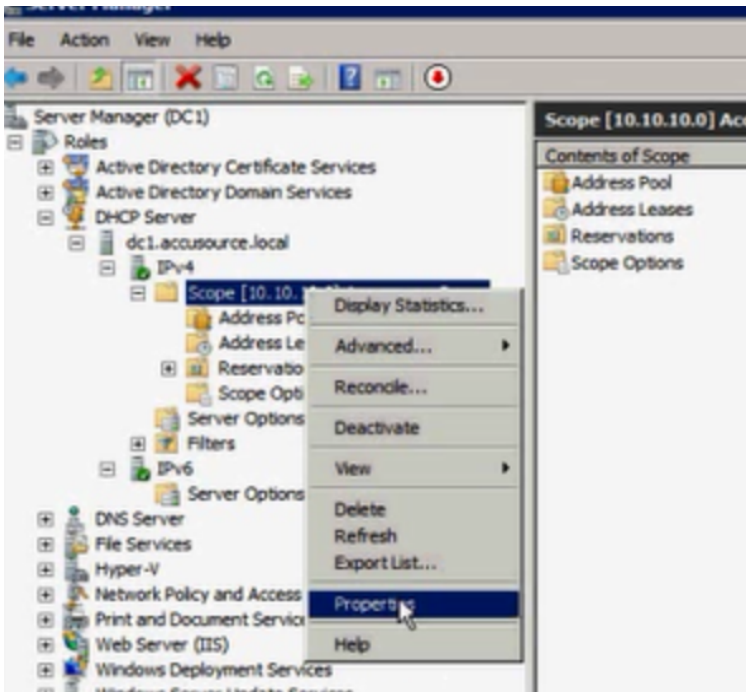
->DHCP Relay Agent

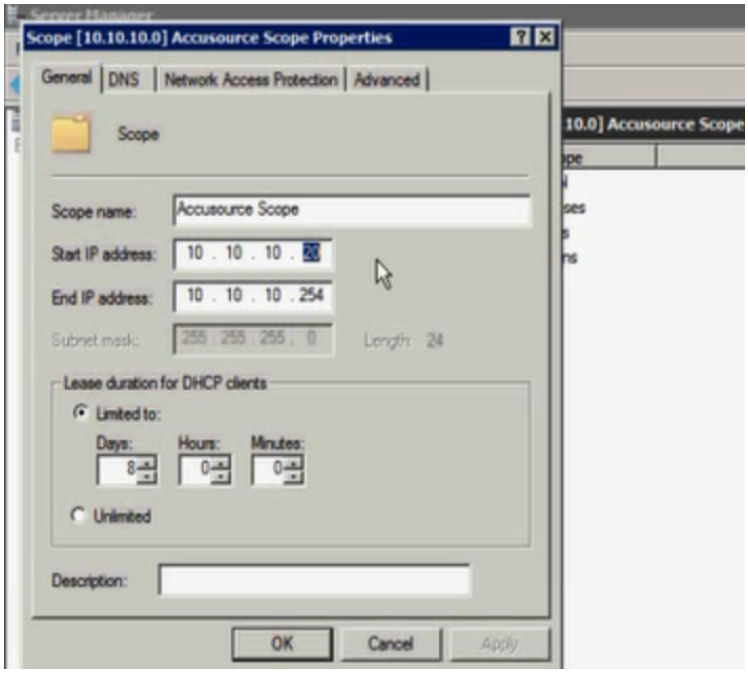


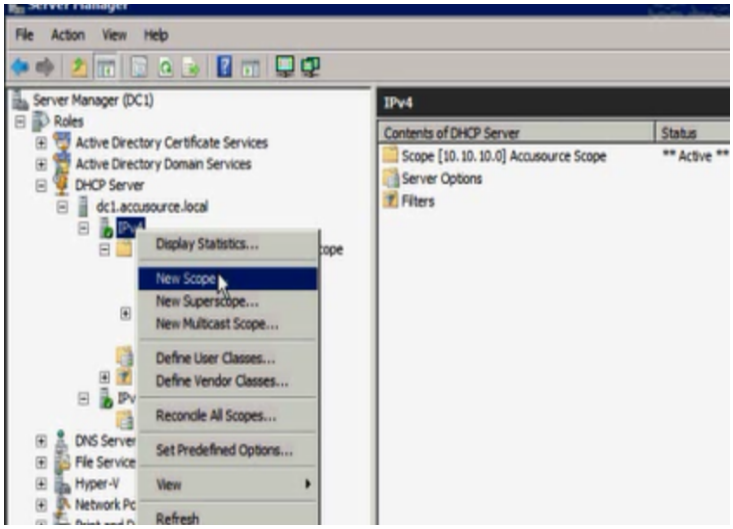

Server Manager
File Action View Help
Server Manager (DC1)
Roles
Add Roles
Remove Roles
View
Refresh
Help
Network Policy and Access Services
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services
Features
Diagnostics
Configuration
Storage
Roles
View the health of the roles installed on your server and add or remove roles and features.
Roles Summary
Roles Summary Help
Roles: 11 of 17 installed
Add Roles
Remove Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
DNS Server
File Services
Hyper-V
Network Policy and Access Services
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services

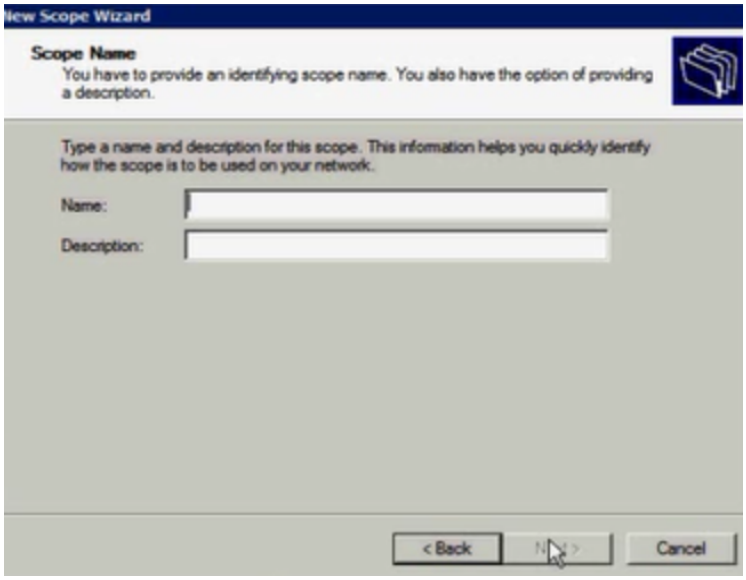

Add Roles Wizard
Select Server Roles
Before You Begin
Server Roles
Confirmation
Progress
Results
Select one or more roles to install on this server.
Roles:
Active Directory Certificate Services (Installed)
Active Directory Domain Services (Installed)
Active Directory Federation Services
Active Directory Lightweight Directory Services
Active Directory Rights Management Services
Application Server
DHCP Server (Installed)
DNS Server (Installed)
Fax Server
File Services (Installed)
Hyper-V (Installed)
Network Policy and Access Services (Installed)
Print and Document Services (Installed)
Remote Desktop Services
Web Server (IIS) (Installed)
Windows Deployment Services (Installed)
Windows Server Update Services (Installed)
Description:
Dynamic Host Configuration Protocol (DHCP) Server enables you to centrally configure, manage, and provide temporary IP addresses and related information for client computers.
More about server roles

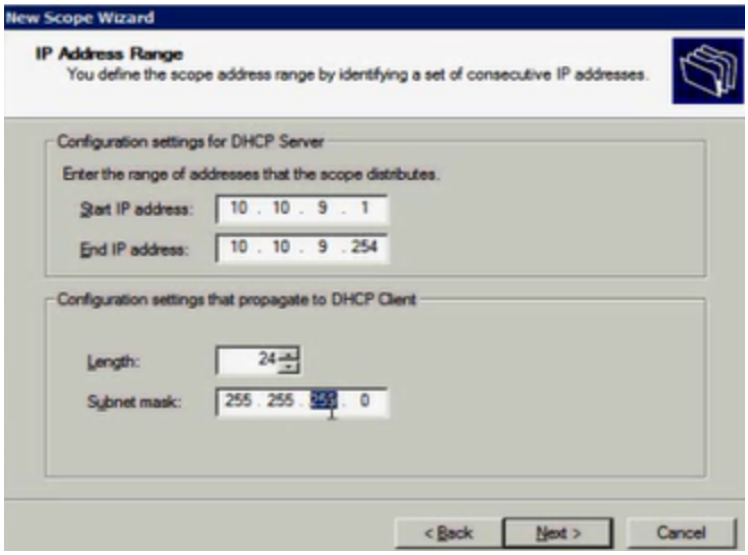

Server Manager
File
Action
View
Help
Server Manager (DC1)
Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
dc1.accusource.local
IPv4
Scope [10.10.10.0] Accusource Scope
Address Pool
Address Leases
Reservations
Scope Options
Server Options
Filters
IPv6
Server Options
DNS Server
File Services
Hyper-V
Network Policy and Access Services
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services
Features
Diagnostics
Configuration
Storage
dc1.accusource.local
Name
IPv4
IPv6

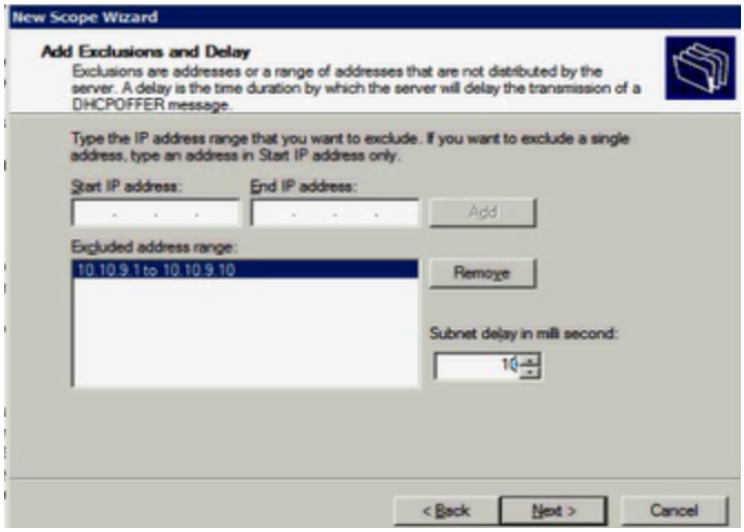

File
Action
View
Help
Server Manager (DC1)
Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
dc1.accusource.local
IPv4
Scope [10.10.10.0] Ac
Contents of Scope
Address Pool
Address Leases
Reservations
Scope Options
Display Statistics...
Advanced...
Reconcile...
Deactivate
View
Delete
Refresh
Export List...
Properties
Help
Server Options
Filters
IPv6
Server Options
DNS Server
File Services
Hyper-V
Web Server (IIS)
Windows Deployment Services

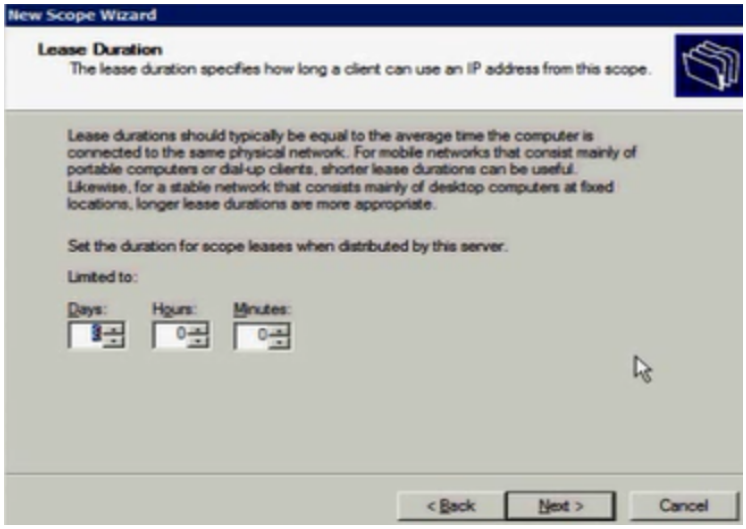

Scope [10.10.10.0] Accusource Scope Properties
General
DNS
Network Access Protection
Advanced
Scope
Scope name:
Accusource Scope
Start IP address:
10 . 10 . 10 . 50
End IP address:
10 . 10 . 10 . 254
Subnet mask:
255 . 255 . 255 . 0
Length: 24
Lease duration for DHCP clients
Limited to:
Days:
Hours:
Minutes:
8
0
0
Unlimited
Description:
OK
Cancel
Apply

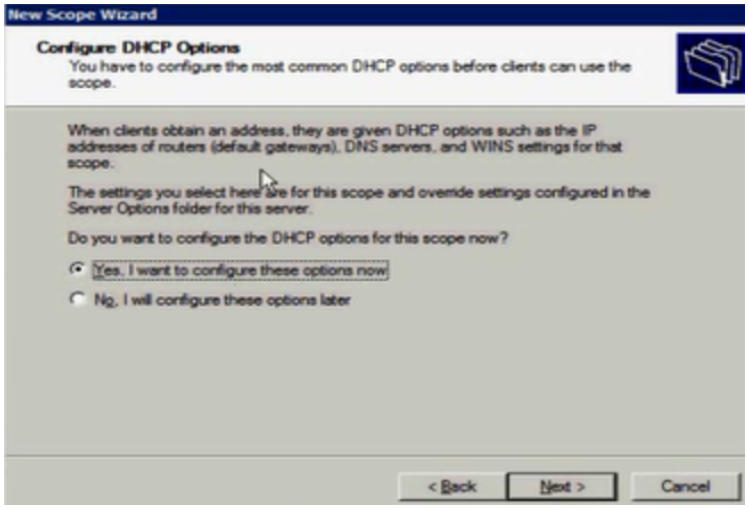

File
Action
View
Help
Server Manager (DC1)
Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
dc1.accusource.local
IPv4
Display Statistics...
New Scope...
New Superscope...
New Multicast Scope...
Define User Classes...
Define Vendor Classes...
Reconcile All Scopes...
Set Predefined Options...
View
Refresh
IPv4
Contents of DHCP Server
Status
Scope [10.10.10.0] Accusource Scope
** Active **
Server Options
Filters

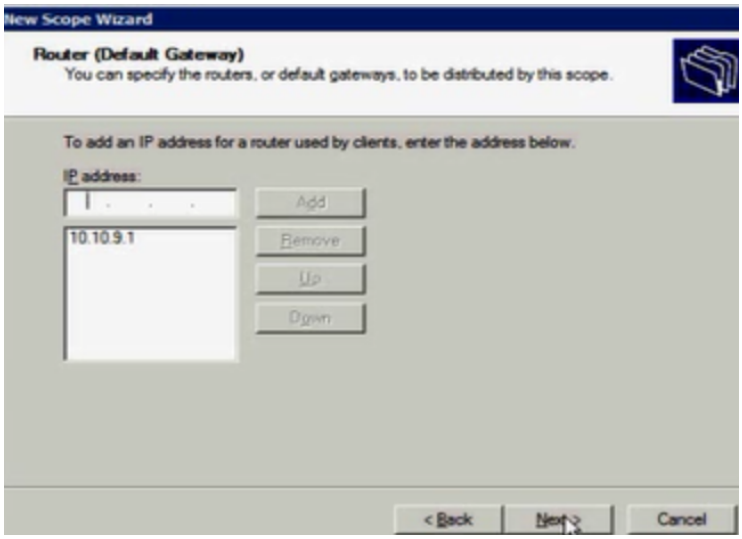

New Scope Wizard
Scope Name
You have to provide an identifying scope name. You also have the option of providing a description.
Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.
Name:
Description:
< Back
Next >
Cancel

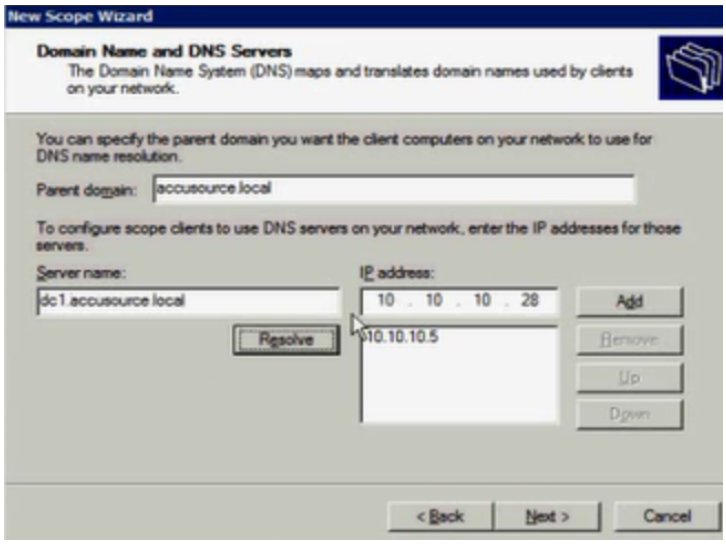

New Scope Wizard
IP Address Range
You define the scope address range by identifying a set of consecutive IP addresses.
Configuration settings for DHCP Server
Enter the range of addresses that the scope distributes.
Start IP address: 10 . 10 . 9 . 1
End IP address: 10 . 10 . 9 . 254
Configuration settings that propagate to DHCP Client
Length: 24
Subnet mask: 255 . 255 . 255 . 0
< Back
Next >
Cancel

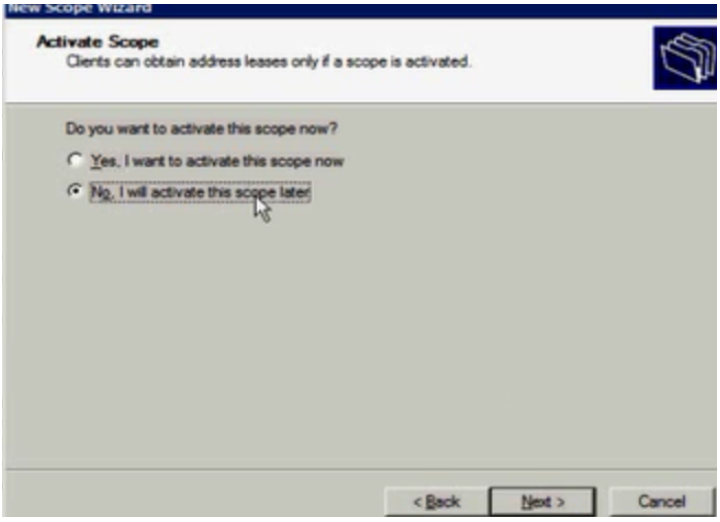

New Scope Wizard
Add Exclusions and Delay
Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCPOFFER message.
Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.
Start IP address:
End IP address:
Add
Excluded address range:
10.10.9.1 to 10.10.9.10
Remove
Subnet delay in mili second:
10
< Back
Next >
Cancel

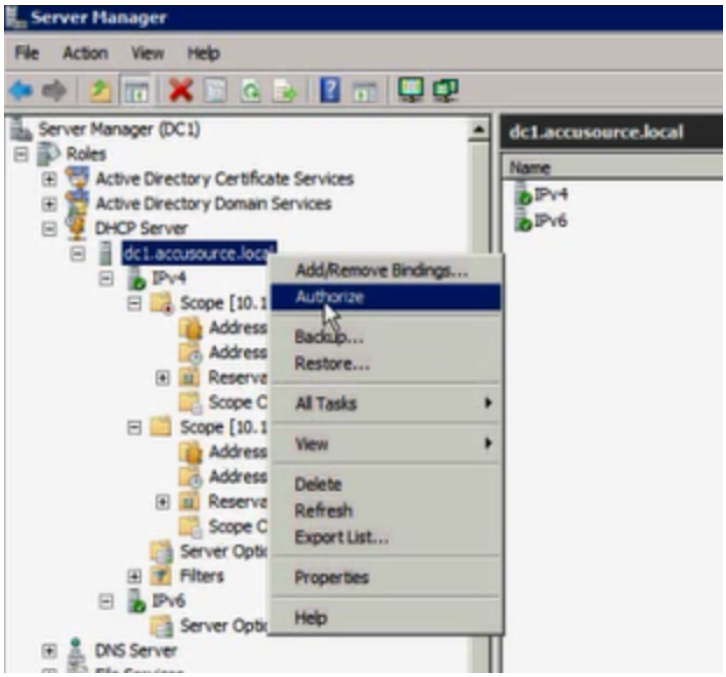

New Scope Wizard
Lease Duration
The lease duration specifies how long a client can use an IP address from this scope.
Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.
Set the duration for scope leases when distributed by this server.
Limited to:
Days:
Hours:
Minutes:
0
0
< Back
Next >
Cancel

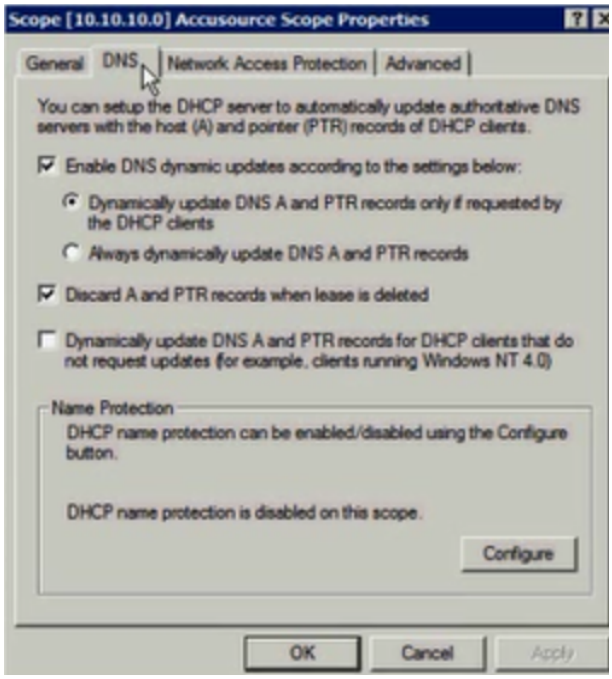

New Scope Wizard
Configure DHCP Options
You have to configure the most common DHCP options before clients can use the scope.
When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.
The settings you select here are for this scope and override settings configured in the Server Options folder for this server.
Do you want to configure the DHCP options for this scope now?
Yes, I want to configure these options now
No, I will configure these options later
< Back
Next >
Cancel

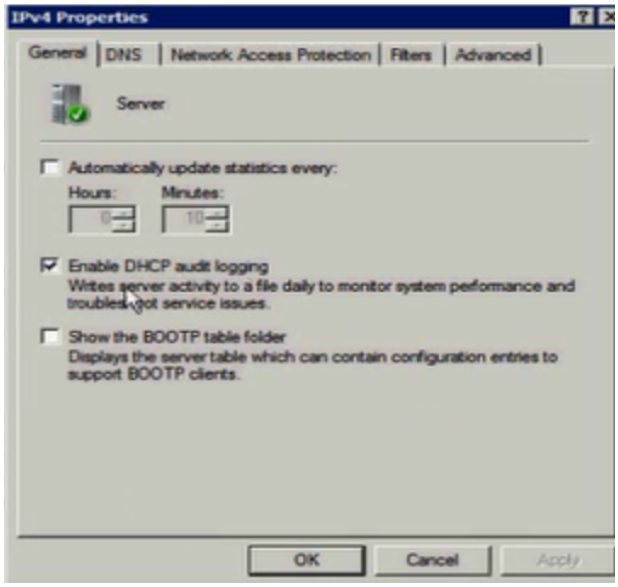

New Scope Wizard
Router (Default Gateway)
You can specify the routers, or default gateways, to be distributed by this scope.
To add an IP address for a router used by clients, enter the address below.
IP address:
10.10.9.1
Add
Remove
Up
Down
< Back
Next >
Cancel

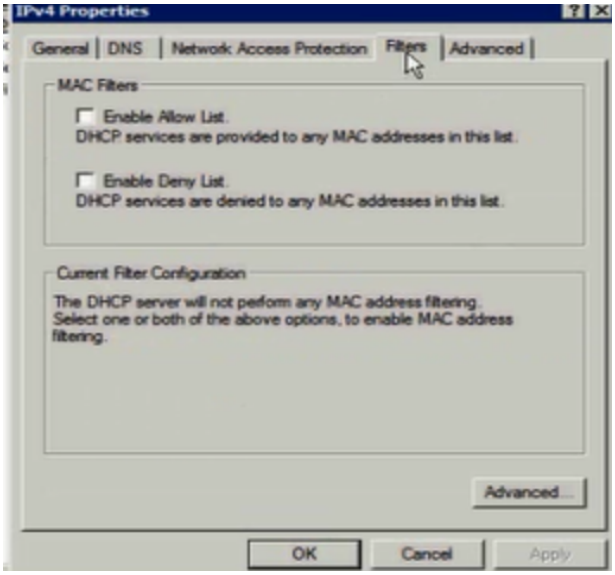

New Scope Wizard
Domain Name and DNS Servers
The Domain Name System (DNS) maps and translates domain names used by clients on your network.
You can specify the parent domain you want the client computers on your network to use for DNS name resolution.
Parent domain:
accusource.local
To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.
Server name:
dc1.accusource.local
Resolve
IP address:
10 . 10 . 10 . 28
10.10.10.5
Add
Remove
Up
Down
< Back
Next >
Cancel

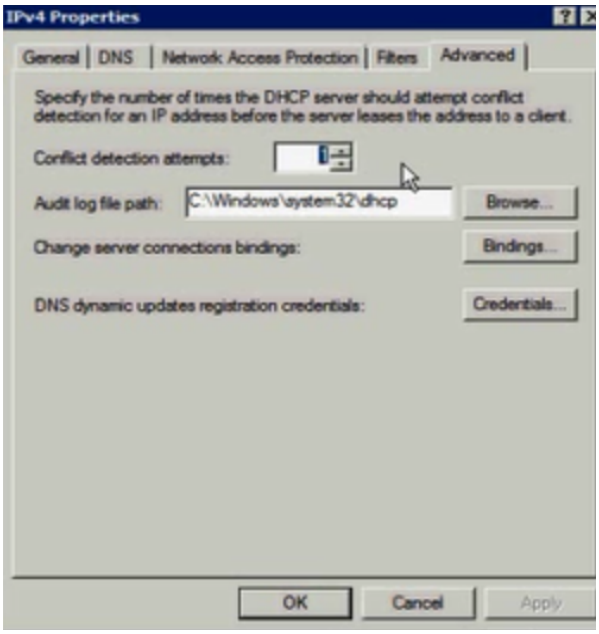

New Scope Wizard
Activate Scope
Clients can obtain address leases only if a scope is activated.
Do you want to activate this scope now?
Yes, I want to activate this scope now
No, I will activate this scope later
< Back
Next >
Cancel

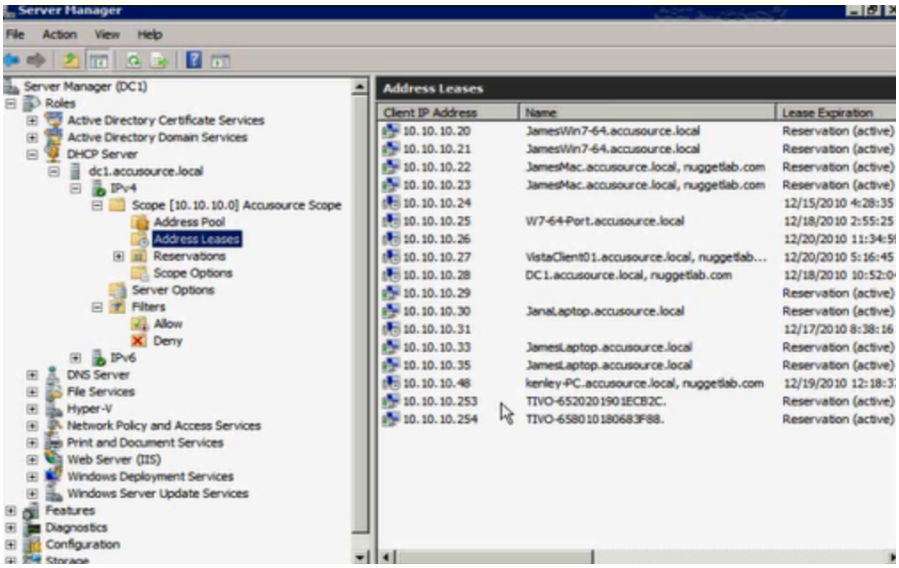

Server Manager
File
Action
View
Help
Server Manager (DC1)
Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
dc1.accusource.local
IPv4
Scope [10.1
Address
Address
Reserve
Scope C
Scope [10.1
Address
Address
Reserve
Scope C
Server Opti
Filters
IPv6
Server Opti
DNS Server
Add/Remove Bindings...
Authorize
Backup...
Restore...
All Tasks
View
Delete
Refresh
Export List...
Properties
Help
dc1.accusource.local
Name
IPv4
IPv6

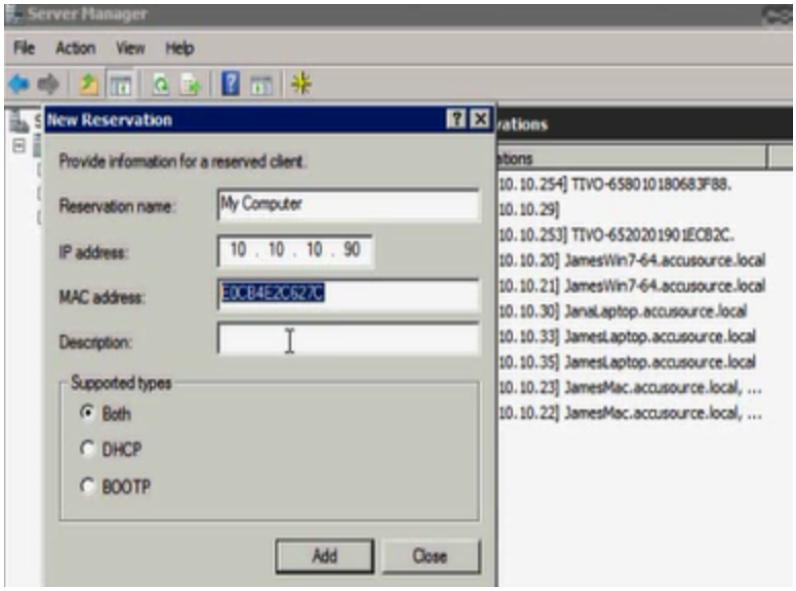

Scope [10.10.10.0] Accusource Scope Properties
General
DNS
Network Access Protection
Advanced
You can setup the DHCP server to automatically update authoritative DNS servers with the host (A) and pointer (PTR) records of DHCP clients.
Enable DNS dynamic updates according to the settings below:
Dynamically update DNS A and PTR records only if requested by the DHCP clients
Always dynamically update DNS A and PTR records
Discard A and PTR records when lease is deleted
Dynamically update DNS A and PTR records for DHCP clients that do not request updates (for example, clients running Windows NT 4.0)
Name Protection
DHCP name protection can be enabled/disabled using the Configure button.
DHCP name protection is disabled on this scope.
Configure
OK
Cancel
Apply

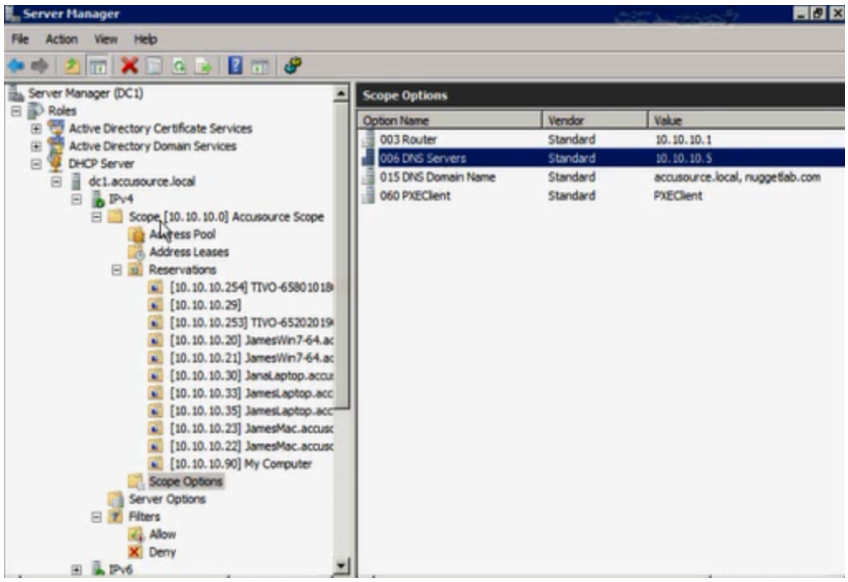

IPv4 Properties
General
DNS
Network Access Protection
Filters
Advanced
Server
Automatically update statistics every:
Hours:
Minutes:
Enable DHCP audit logging
Writes server activity to a file daily to monitor system performance and troubleshoot service issues.
Show the BOOTP table folder
Displays the server table which can contain configuration entries to support BOOTP clients.
OK
Cancel
Apply


IPv4 Properties
General
DNS
Network Access Protection
Filters
Advanced
MAC Filters
Enable Allow List.
DHCP services are provided to any MAC addresses in this list.
Enable Deny List.
DHCP services are denied to any MAC addresses in this list.
Current Filter Configuration
The DHCP server will not perform any MAC address filtering.
Select one or both of the above options, to enable MAC address filtering.
Advanced...
OK
Cancel
Apply

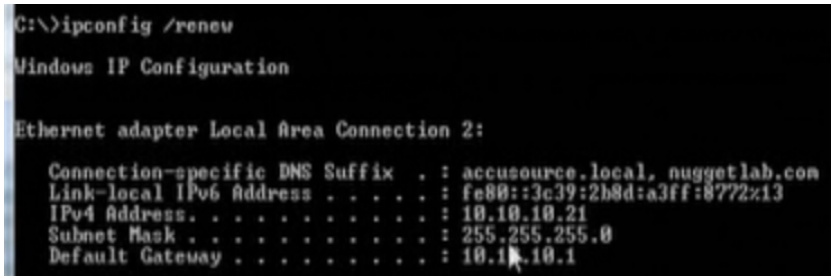

IPv4 Properties
General
DNS
Network Access Protection
Filters
Advanced
Specify the number of times the DHCP server should attempt conflict detection for an IP address before the server leases the address to a client.
Conflict detection attempts:
Audit log file path:
C:\Windows\system32\dhcp
Browse...
Change server connections bindings:
Bindings...
DNS dynamic updates registration credentials:
Credentials...
OK
Cancel
Apply


Server Manager
File
Action
View
Help
Server Manager (DC1)
Roles
Active Directory Certificate Services
Active Directory Domain Services
DHCP Server
dc1.accusource.local
IPv4
Scope [10.10.10.0] Accusource Scope
Address Pool
Address Leases
Reservations
Scope Options
Server Options
Filters
Allow
Deny
IPv6
DNS Server
File Services
Hyper-V
Network Policy and Access Services
Print and Document Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services
Features
Diagnostics
Configuration
Address Leases
Client IP Address
Name
Lease Expiration
10.10.10.20 JamesWin7-64.accusource.local Reservation (active)
10.10.10.21 JamesWin7-64.accusource.local Reservation (active)
10.10.10.22 JamesMac.accusource.local, nuggetlab.com Reservation (active)
10.10.10.23 JamesMac.accusource.local, nuggetlab.com Reservation (active)
10.10.10.24 12/15/2010 4:28:35
10.10.10.25 W7-64-Port.accusource.local 12/18/2010 2:55:25
10.10.10.26 12/20/2010 11:34:5
10.10.10.27 VistaClient01.accusource.local, nuggetlab... 12/20/2010 5:16:45
10.10.10.28 DC1.accusource.local, nuggetlab.com 12/18/2010 10:52:0
10.10.10.29 Reservation (active)
10.10.10.30 JanaLaptop.accusource.local Reservation (active)
10.10.10.31 12/17/2010 8:38:16
10.10.10.33 JamesLaptop.accusource.local Reservation (active)
10.10.10.35 JamesLaptop.accusource.local Reservation (active)
10.10.10.48 kenley-PC.accusource.local, nuggetlab.com 12/19/2010 12:18:3
10.10.10.253 TIVO-6520201901ECB2C. Reservation (active)
10.10.10.254 TIVO-658010180683F88. Reservation (active)





->Scope options and Server Options (for all the scopes)



```
C:\>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\>ipconfig /displaydns

Windows IP Configuration

Could not display the DNS Resolver Cache.

C:\>ping dc1

Pinging dc1.accusource.local [10.10.10.5] with 32 bytes of data:
Reply from 10.10.10.5: bytes=32 time=18ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127
Reply from 10.10.10.5: bytes=32 time=1ms TTL=127

Ping statistics for 10.10.10.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 18ms, Average = 5ms

C:\>
```

Administrator: Command Prompt

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Windows\system32>ipconfig /registerdns

Windows IP Configuration

Registration of the DNS resource records for all adapters of this computer has b
een initiated. Any errors will be reported in the Event Viewer in 15 minutes.

C:\Windows\system32>
```

Server Manager

File Action View Help

Server Manager (DC1)
- Roles
  - Active Directory Certificate Services
  - Active Directory Domain Services
  - DHCP Server
  - DNS Server
    - DNS
  - File Services
    - Share and Storage Management
      - File Server Resource Manager
      - Disk Management
    - DFS Management
  - Hyper-V
  - Network Policy and Access Services
  - Print and Document Services
  - Web Server (IIS)
  - Windows Deployment Services
  - Windows Server Update Services
- Features
  - Group Policy Management
- Diagnostics
- Configuration
- Storage

Share and Storage Management

Shares | Volumes

19 entries

Share Na...	Protocol	Local Path	Quota	File Scr...	Shado...
Protocol: SMB (19 items)					
ADMIN$	SMB	C:\Windows			
C$	SMB	C:\			
CertEnroll	SMB	C:\Windows\sys...			
D$	SMB	D:\	✓		✓
Home	SMB	D:\Home	✓		✓
IPC$	SMB				
J$	SMB	J:\			
M$	SMB	M:\			
NETLOG...	SMB	C:\Windows\SY...			
P$	SMB	P:\	✓		✓
Photos	SMB	P:\Photos	✓		✓
Photos2	SMB	P:\Photos	✓		✓
REMINST	SMB	W:\RemoteInstall			
Source	SMB	D:\Source	✓		✓

Command Prompt

```
C:\>net use q: \\dc1\photos2
The command completed successfully.

C:\>
```

```
Command Prompt

C:\>net use
New connections will be remembered.

Status       Local     Remote                    Network
-------------------------------------------------------------------------------
OK           H:        \\dc1\home                Microsoft Windows Network
OK           P:        \\dc1\photos              Microsoft Windows Network
OK           Q:        \\dc1\photos2             Microsoft Windows Network
OK           S:        \\dc1\source              Microsoft Windows Network
OK                     \\dc1\home                Microsoft Windows Network
The command completed successfully.

C:\>net use q: /del
q: was deleted successfully.

C:\>net use
New connections will be remembered.

Status       Local     Remote                    Network
-------------------------------------------------------------------------------
OK           H:        \\dc1\home                Microsoft Windows Network
OK           P:        \\dc1\photos              Microsoft Windows Network
OK           S:        \\dc1\source              Microsoft Windows Network
OK                     \\dc1\home                Microsoft Windows Network
The command completed successfully.
```

```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation.  All rights res

C:\Windows\system32>netstat -s

IPv4 Statistics

  Packets Received                   = 23994415
  Received Header Errors             = 0
  Received Address Errors            = 10779655
  Datagrams Forwarded                = 0
  Unknown Protocols Received         = 0
  Received Packets Discarded         = 22020
  Received Packets Delivered         = 14075004
  Output Requests                    = 9590576
  Routing Discards                   = 0
  Discarded Output Packets           = 103555
  Output Packet No Route             = 40
  Reassembly Required                = 0
  Reassembly Successful              = 0
  Reassembly Failures                = 0
  Datagrams Successfully Fragmented  = 0
  Datagrams Failing Fragmentation    = 0
  Fragments Created                  = 0

IPv6 Statistics

  Packets Received                   = 5425
  Received Header Errors             = 0
  Received Address Errors            = 2228
  Datagrams Forwarded                = 0
  Unknown Protocols Received         = 0
  Received Packets Discarded         = 12
  Received Packets Delivered         = 11165
  Output Requests                    = 38597
  Routing Discards                   = 0
  Discarded Output Packets           = 0
  Output Packet No Route             = 63
  Reassembly Required                = 0
  Reassembly Successful              = 0
  Reassembly Failures                = 0
  Datagrams Successfully Fragmented  = 0
  Datagrams Failing Fragmentation    = 0
  Fragments Created                  = 0
```

```
C:\Windows\system32>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:445            JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:912            JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:3260           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:3261           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:3389           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:5357           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:5985           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:8019           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:9876           JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:17500          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:31038          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:41380          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:47001          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:49152          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:49153          JamesWin7-64:0         LISTENING
  TCP    0.0.0.0:49154          JamesWin7-64:0         LISTENING
```

Windows Command Processor - nslookup

```
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Windows\System32>nslookup www.google.com
Server:  SkyRouter.Home
Address:  192.168.0.1

Non-authoritative answer:
Name:    www.google.com
Addresses:  2a00:1450:4009:807::1014
          173.194.41.115
          173.194.41.116
          173.194.41.114
          173.194.41.113
          173.194.41.112


C:\Windows\System32>nslookup
Default Server:  SkyRouter.Home
Address:  192.168.0.1

> set type=mail
unknown query type: mail
> set type=mx
> google.com
Server:  SkyRouter.Home
Address:  192.168.0.1

Non-authoritative answer:
google.com      MX preference = 10, mail exchanger = aspmx.l.google.com
google.com      MX preference = 30, mail exchanger = alt2.aspmx.l.google.com
google.com      MX preference = 50, mail exchanger = alt4.aspmx.l.google.com
google.com      MX preference = 20, mail exchanger = alt1.aspmx.l.google.com
google.com      MX preference = 40, mail exchanger = alt3.aspmx.l.google.com

alt4.aspmx.l.google.com internet address = 173.194.79.26
alt1.aspmx.l.google.com internet address = 173.194.70.26
alt3.aspmx.l.google.com internet address = 74.125.143.26
aspmx.l.google.com      internet address = 173.194.66.26
alt2.aspmx.l.google.com internet address = 173.194.69.26
> _
```

```
C:\Windows\System32>
C:\Windows\System32>tracert google.com

Tracing route to google.com [173.194.34.165]
over a maximum of 30 hops:

  1     2 ms     9 ms     4 ms  SkyRouter.Home [192.168.0.1]
  2     *        *        *     Request timed out.
  3    11 ms    10 ms    10 ms  ip-84-38-37-10.easynet.co.uk [84.38.37.10]
  4    10 ms    13 ms    13 ms  027808af.bb.sky.com [2.120.8.175]
  5    12 ms     9 ms     9 ms  74.125.51.109
  6    10 ms     9 ms     8 ms  209.85.255.76
  7    13 ms     9 ms    10 ms  209.85.253.175
  8     7 ms     9 ms     8 ms  lhr14s22-in-f5.1e100.net [173.194.34.165]

Trace complete
```

Command Prompt

```
C:\>pathping www.cbtnuggets.com

Tracing route to a304.b.akanai.net [174.76.227.33]
over a maximum of 30 hops:
  0  JamesWin7-64.accusource.local [10.10.10.21]
  1  LINKSYSWRT350N [10.10.10.1]
  2  10.113.224.1
  3  ip68-2-6-41.ph.ph.cox.net [68.2.6.41]
  4  mcdldsrj01-ae2.0.rd.ph.cox.net [70.169.76.225]
  5  langbprj02-ae2.0.rd.la.cox.net [68.1.1.231]
  6  174.76.227.33

Computing statistics for 150 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           JamesWin7-64.accusource.local [10.
10.10.21]
                                   0/ 100 =  0%   |
  1    0ms     0/ 100 =  0%        0/ 100 =  0%  LINKSYSWRT350N [10.10.10.1]
                                   0/ 100 =  0%   |
  2    9ms     0/ 100 =  0%        0/ 100 =  0%  10.113.224.1
                                   0/ 100 =  0%   |
  3   11ms     0/ 100 =  0%        0/ 100 =  0%  ip68-2-6-41.ph.ph.cox.net [68.2.6.
41]
```

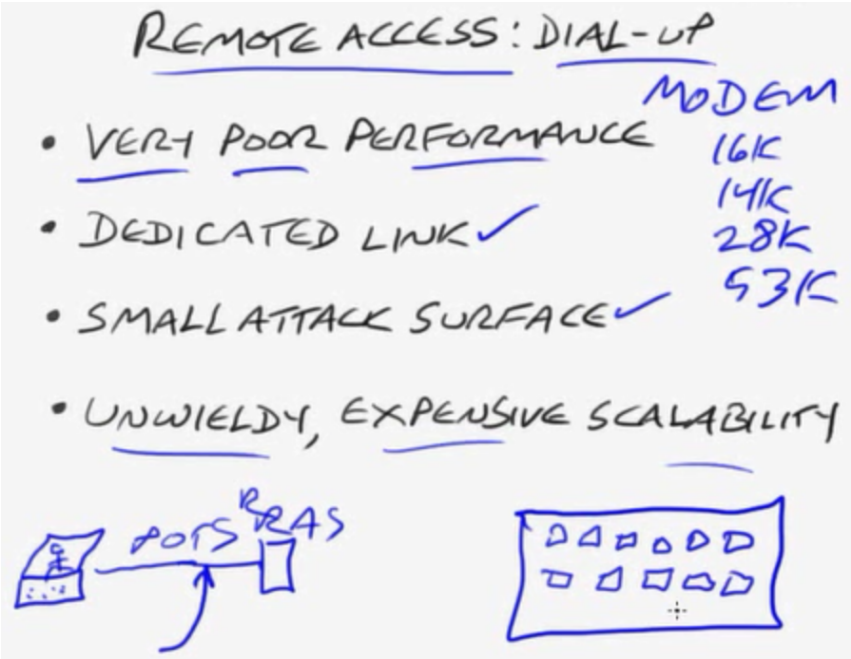
Select Command Prompt

```
Computing statistics for 150 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           JamesWin7-64.accusource.local [10.
10.10.21]
                                   0/ 100 =  0%   |
  1    0ms     0/ 100 =  0%        0/ 100 =  0%  LINKSYSWRT350N [10.10.10.1]
                                   0/ 100 =  0%   |
  2    9ms     0/ 100 =  0%        0/ 100 =  0%  10.113.224.1
                                   0/ 100 =  0%   |
  3   11ms     0/ 100 =  0%        0/ 100 =  0%  ip68-2-6-41.ph.ph.cox.net [68.2.6.
41]
                                   0/ 100 =  0%   |
  4   16ms     0/ 100 =  0%        0/ 100 =  0%  mcdldsrj01-ae2.0.rd.ph.cox.net [70
.169.76.225]
                                   0/ 100 =  0%   |
  5  ---     100/ 100 =100%     100/ 100 =100%  langbprj02-ae2.0.rd.la.cox.net [68
.1.1.231]
                                   0/ 100 =  0%   |
  6   24ms     0/ 100 =  0%        0/ 100 =  0%  174.76.227.33

Trace complete.
```

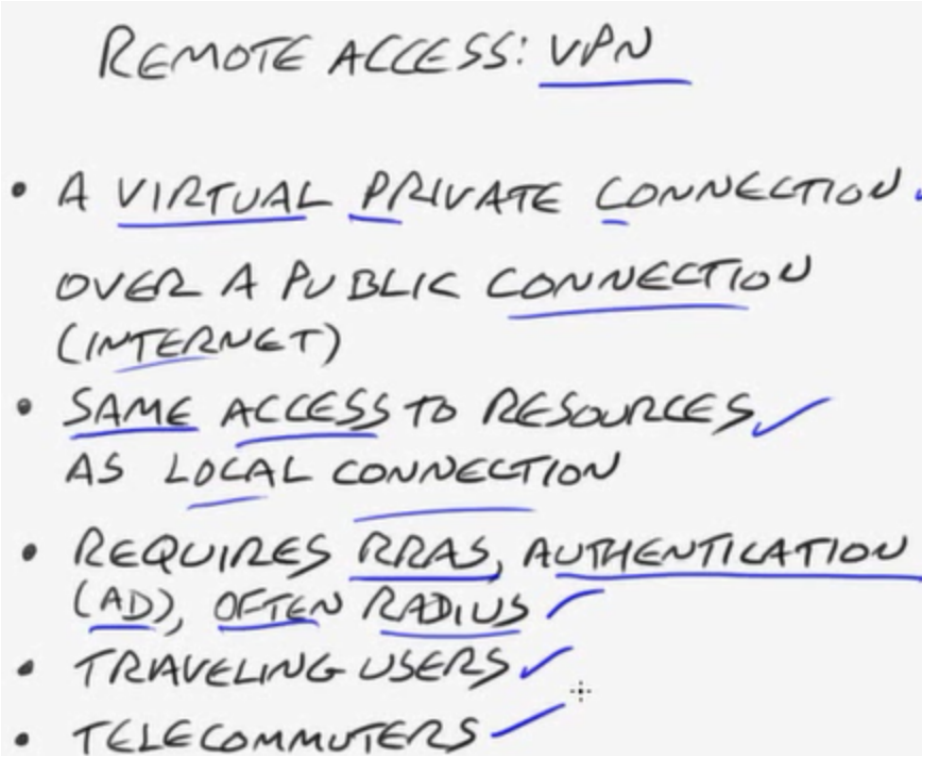
```
C:\Windows\System32>ping google.com -n 5

Pinging google.com [173.194.41.105] with 32 bytes of data:
Reply from 173.194.41.105: bytes=32 time=10ms TTL=58
Reply from 173.194.41.105: bytes=32 time=8ms TTL=58
Reply from 173.194.41.105: bytes=32 time=19ms TTL=58
Reply from 173.194.41.105: bytes=32 time=16ms TTL=58
Reply from 173.194.41.105: bytes=32 time=9ms TTL=58

Ping statistics for 173.194.41.105:
    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 19ms, Average = 12ms

C:\Windows\System32>ping google.com -n 5 -l 1000

Pinging google.com [173.194.41.105] with 1000 bytes of data:
Reply from 173.194.41.105: bytes=1000 time=12ms TTL=58
Reply from 173.194.41.105: bytes=1000 time=11ms TTL=58
Reply from 173.194.41.105: bytes=1000 time=23ms TTL=58
Reply from 173.194.41.105: bytes=1000 time=10ms TTL=58
Reply from 173.194.41.105: bytes=1000 time=10ms TTL=58

Ping statistics for 173.194.41.105:
    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 23ms, Average = 13ms

C:\Windows\System32>ping google.com -t -l 10000

Pinging google.com [173.194.41.105] with 10000 bytes of data:
Reply from 173.194.41.105: bytes=10000 time=34ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=35ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=25ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=32ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=27ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=25ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=31ms TTL=58
Reply from 173.194.41.105: bytes=10000 time=26ms TTL=58

Ping statistics for 173.194.41.105:
    Packets: Sent = 8, Received = 8, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 25ms, Maximum = 35ms, Average = 29ms
Control-C
^C
```

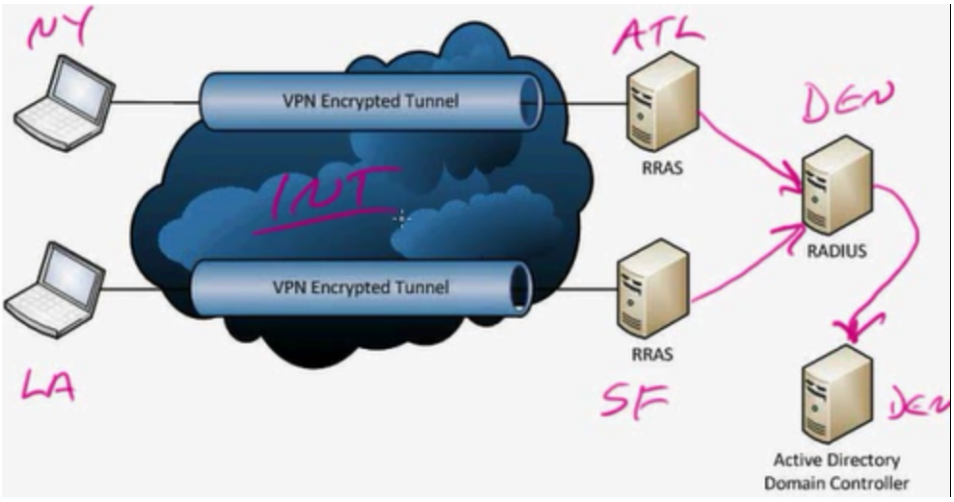
REMOTE ACCESS

- DIAL-UP
- VPN
  - PPTP
  - L2TP
  - SSTP
  - IKEV2
  - DIRECT ACCESS

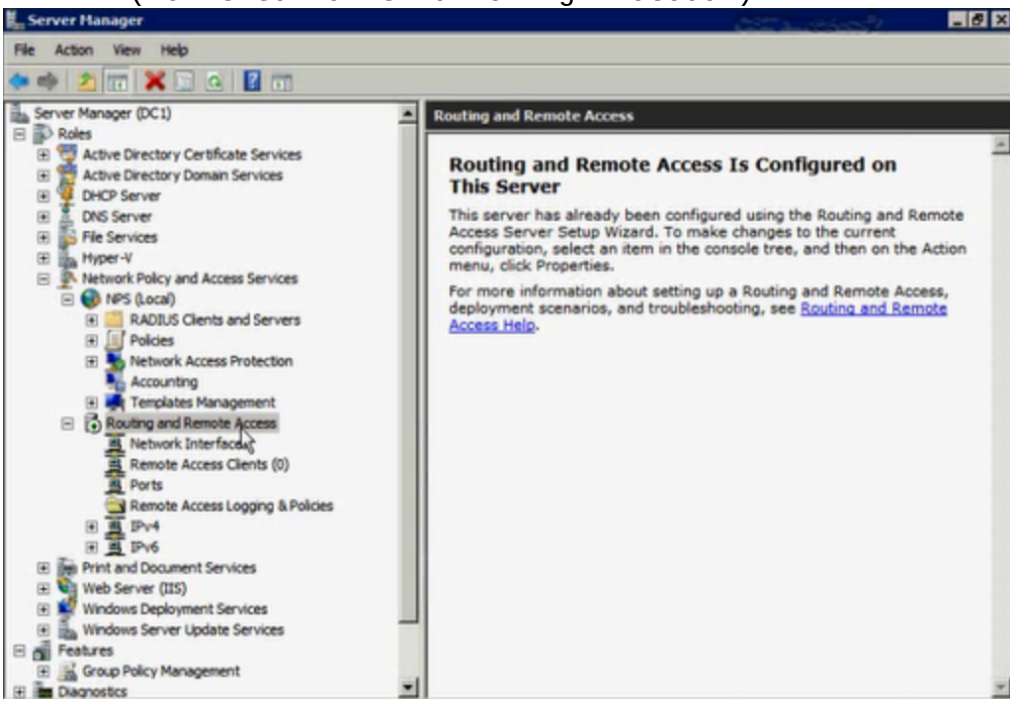


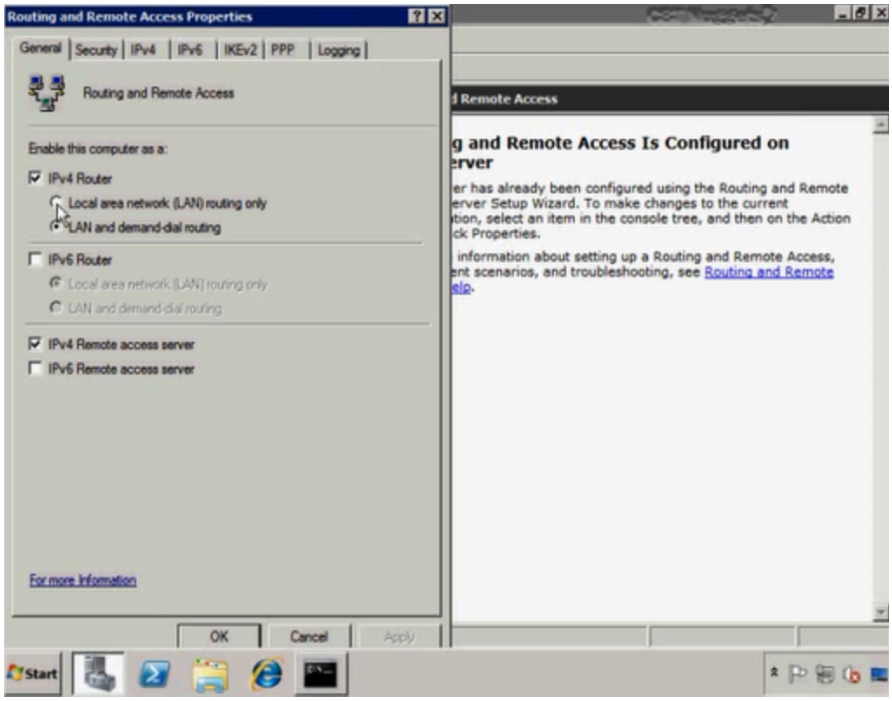
->RRAS(Routing Remote Access Server)

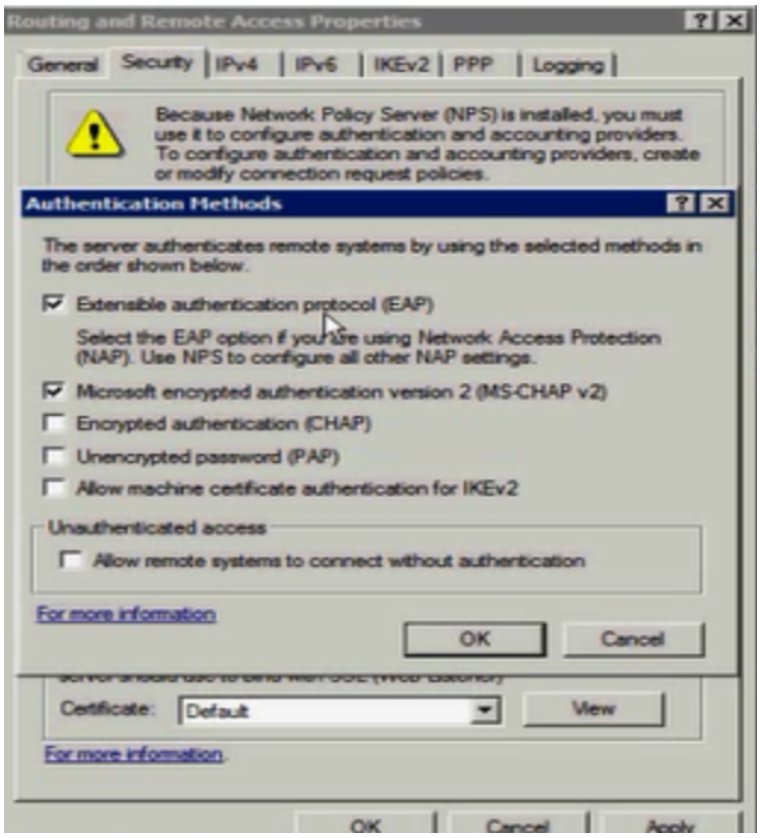


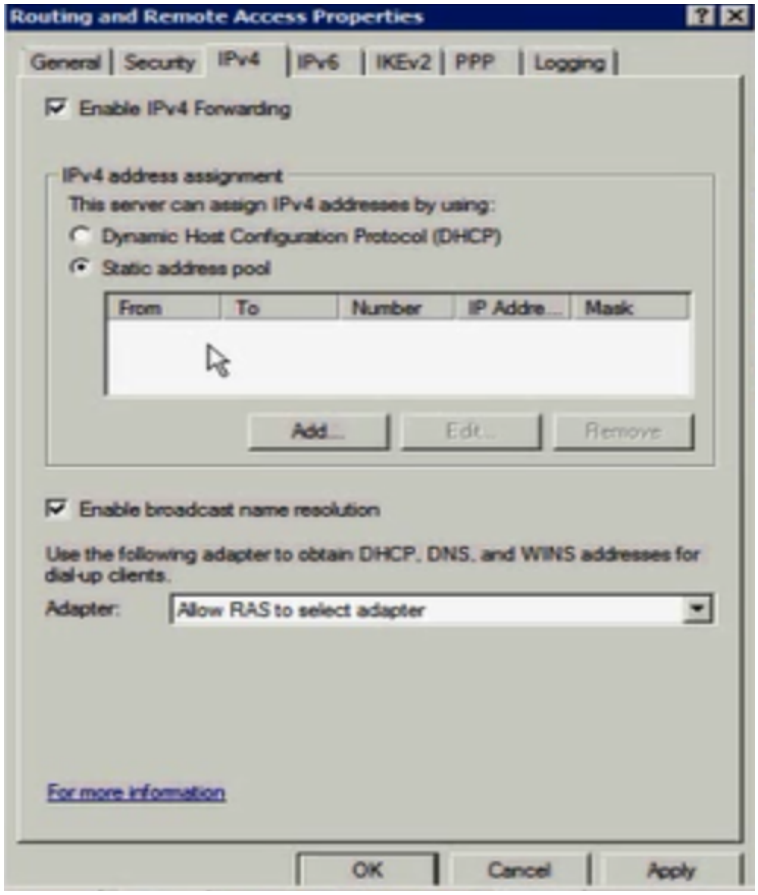


->PPTP (Point to Point Tunneling Protocol)

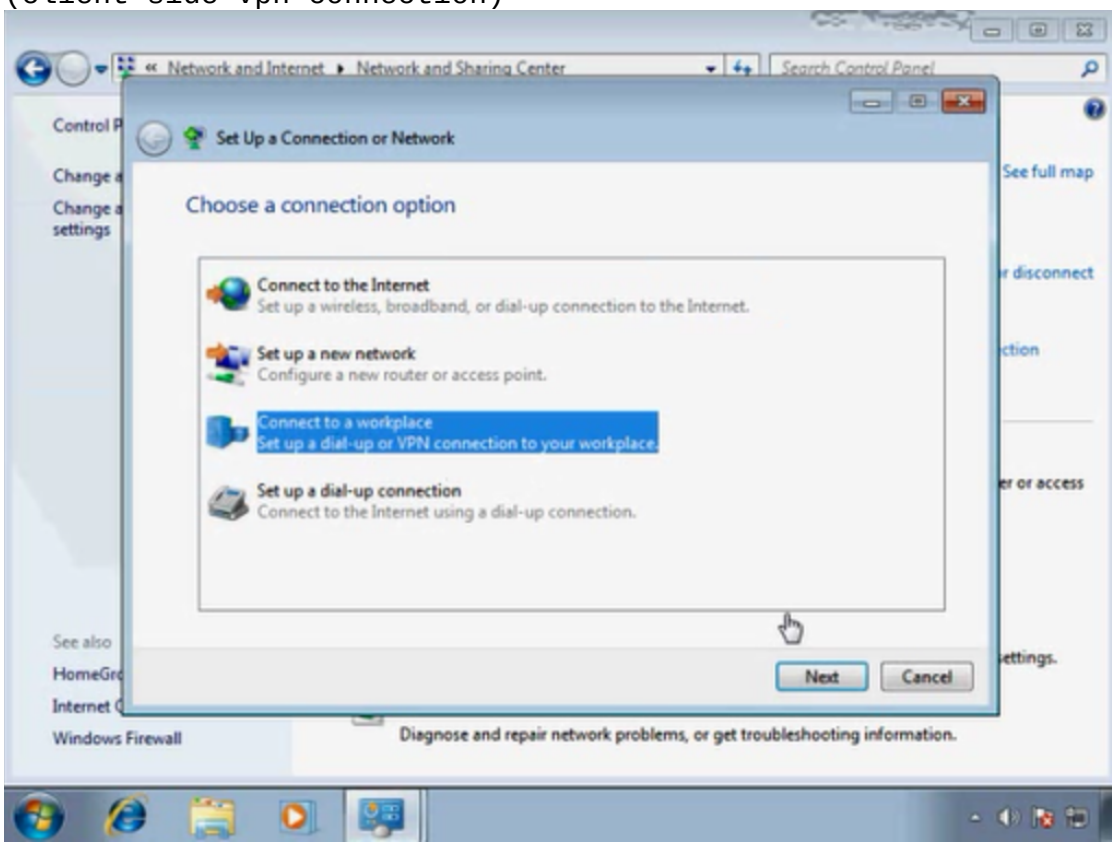


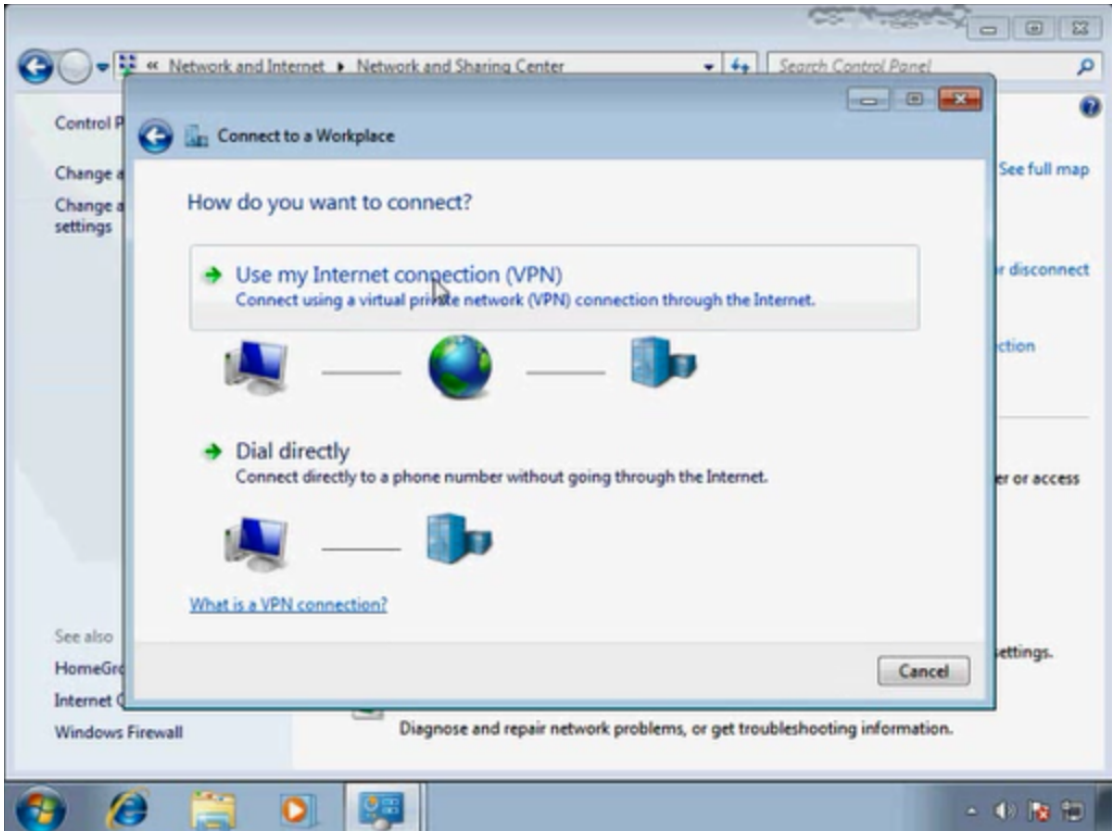

Routing and Remote Access Properties
General
Security
IPv4
IPv6
IKEv2
PPP
Logging
Routing and Remote Access
Enable this computer as a:
IPv4 Router
Local area network (LAN) routing only
LAN and demand-dial routing
IPv6 Router
Local area network (LAN) routing only
LAN and demand-dial routing
IPv4 Remote access server
IPv6 Remote access server
For more information
OK
Cancel
Apply
Start

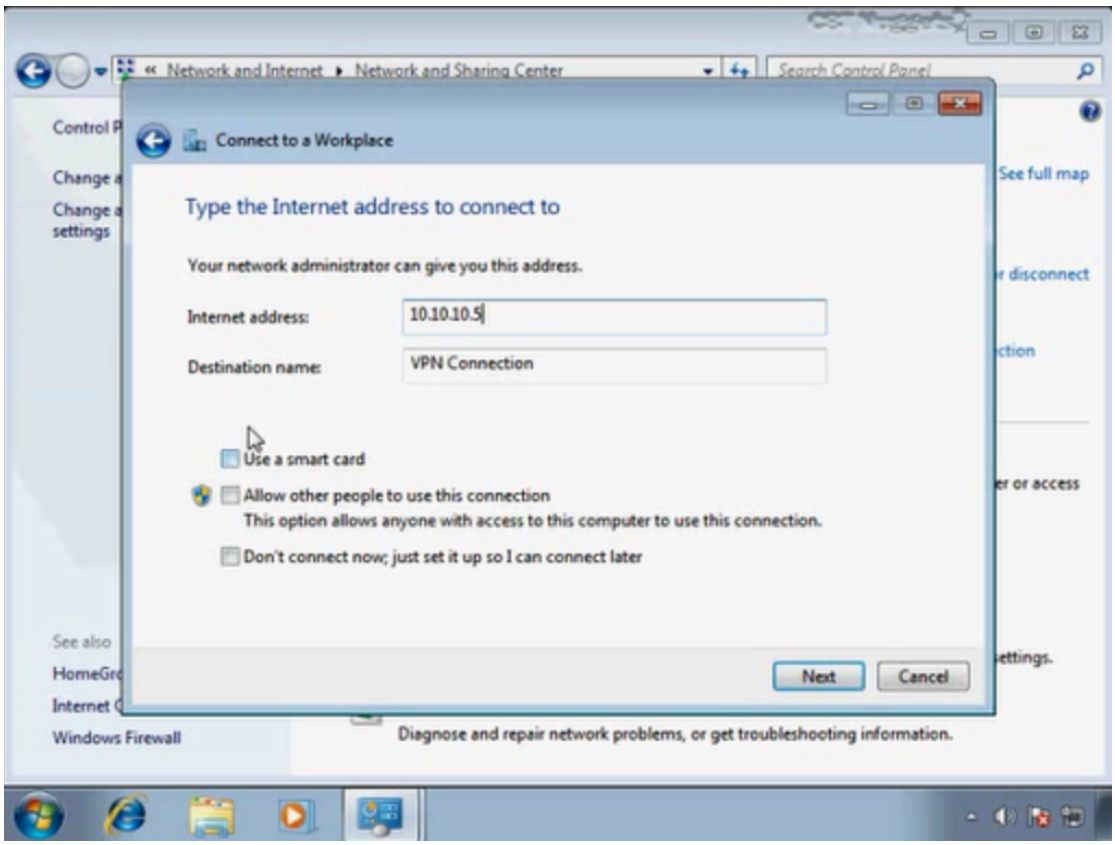

Routing and Remote Access Properties
General
Security
IPv4
IPv6
IKEv2
PPP
Logging
Because Network Policy Server (NPS) is installed, you must use it to configure authentication and accounting providers. To configure authentication and accounting providers, create or modify connection request policies.
Authentication Methods
The server authenticates remote systems by using the selected methods in the order shown below.
Extensible authentication protocol (EAP)
Select the EAP option if you are using Network Access Protection (NAP). Use NPS to configure all other NAP settings.
Microsoft encrypted authentication version 2 (MS-CHAP v2)
Encrypted authentication (CHAP)
Unencrypted password (PAP)
Allow machine certificate authentication for IKEv2
Unauthenticated access
Allow remote systems to connect without authentication
For more information
OK
Cancel
Certificate:
Default
View
For more information.
OK
Cancel
Apply

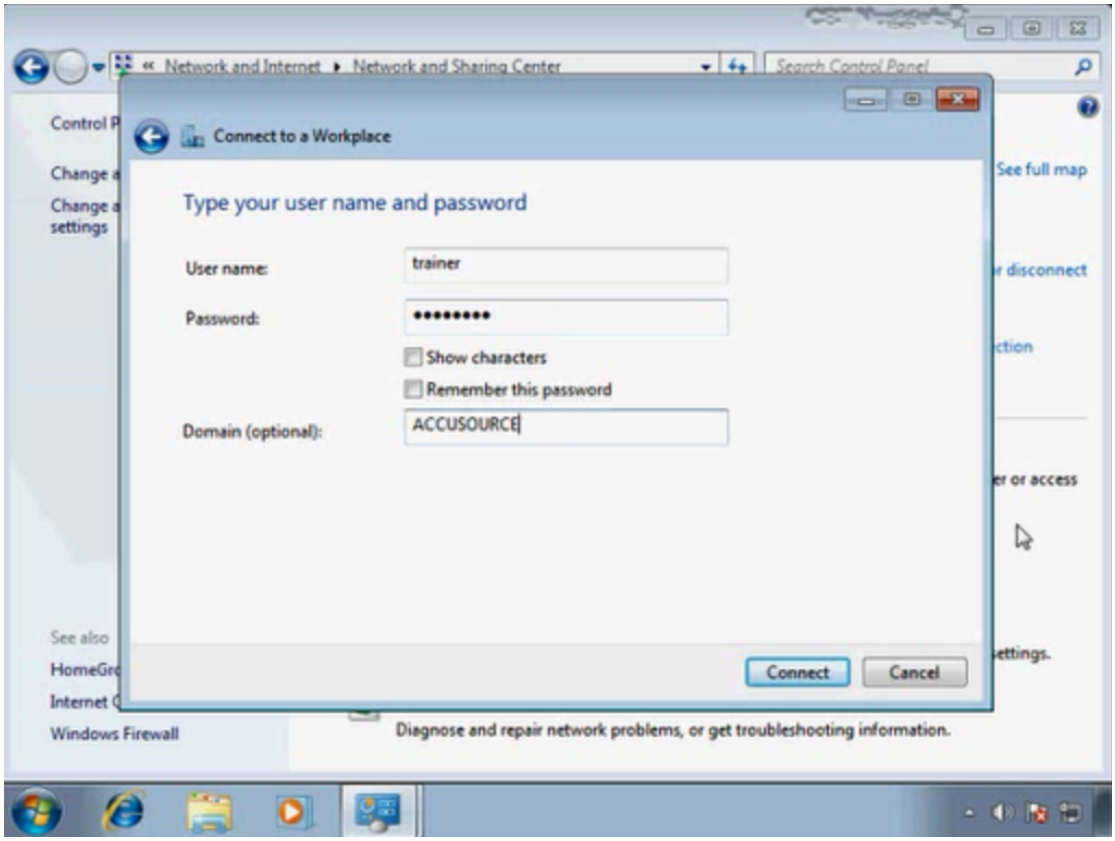


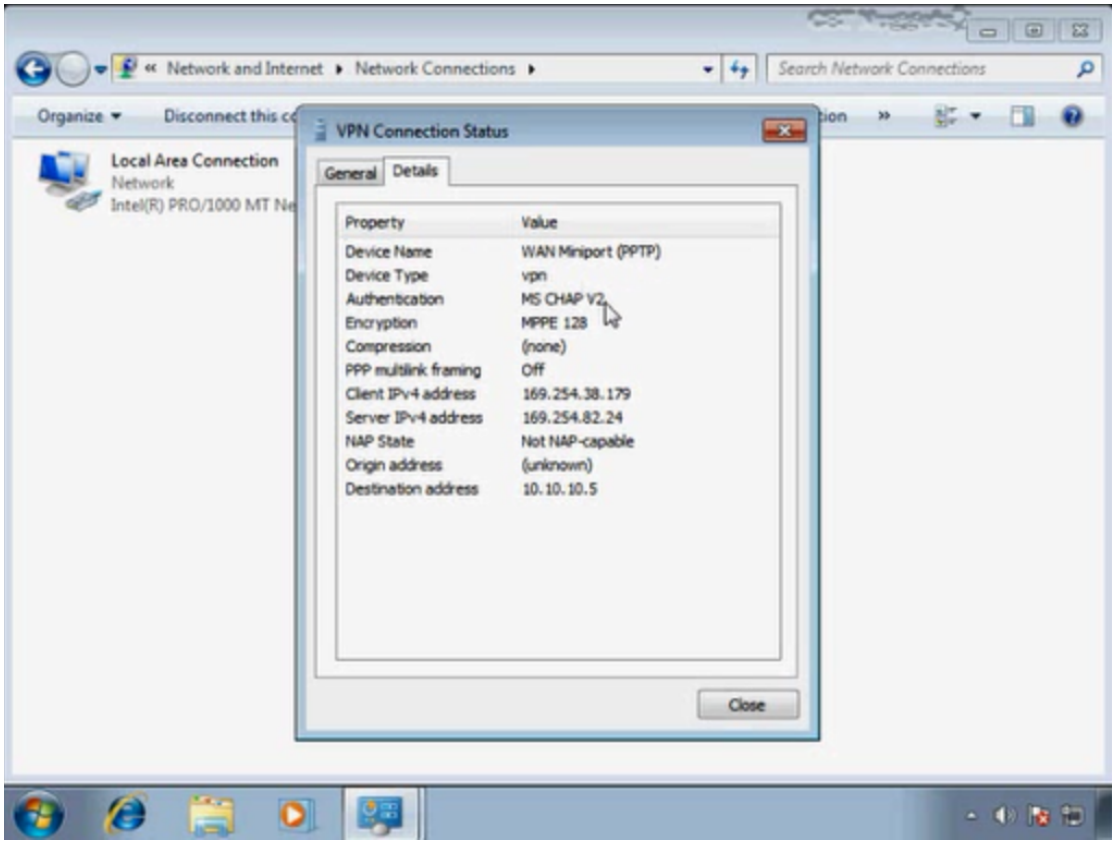
(client side vpn connection)

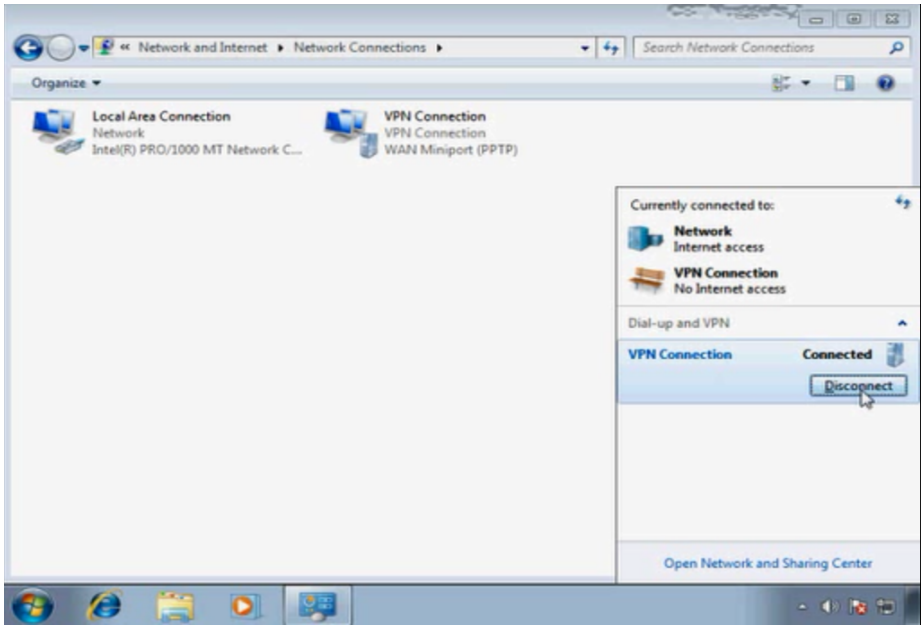


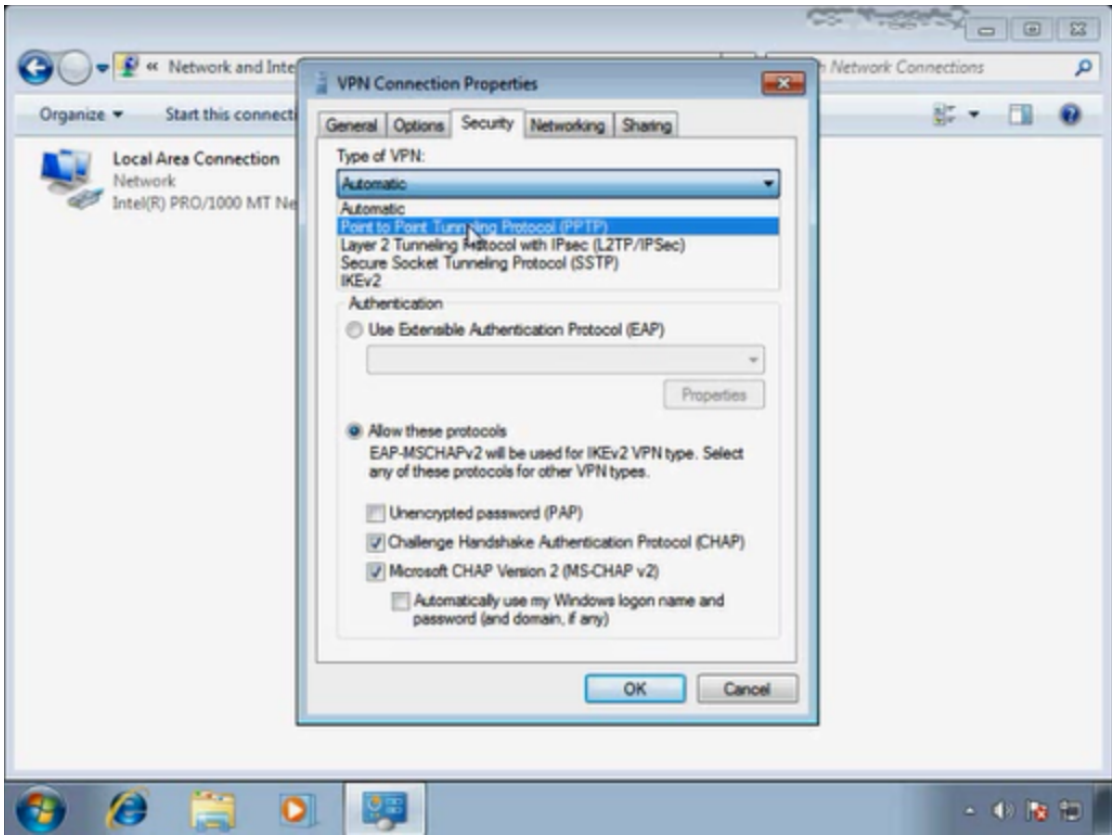

Network and Internet ▸ Network and Sharing Center
Search Control Panel
Connect to a Workplace
How do you want to connect?
Use my Internet connection (VPN)
Connect using a virtual private network (VPN) connection through the Internet.
Dial directly
Connect directly to a phone number without going through the Internet.
What is a VPN connection?
Cancel
See full map
See also
Windows Firewall
Diagnose and repair network problems, or get troubleshooting information.

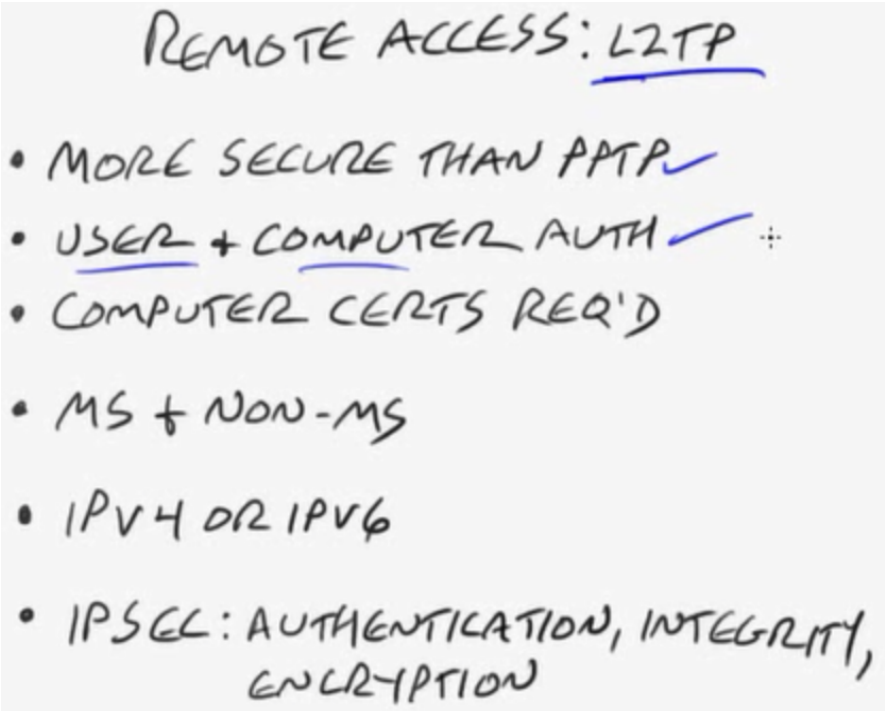

Network and Internet ▸ Network and Sharing Center
Search Control Panel
Connect to a Workplace
Type the Internet address to connect to
Your network administrator can give you this address.
Internet address:
10.10.10.5
Destination name:
VPN Connection
Use a smart card
Allow other people to use this connection
This option allows anyone with access to this computer to use this connection.
Don't connect now; just set it up so I can connect later
Next
Cancel
See full map
See also
Windows Firewall
Diagnose and repair network problems, or get troubleshooting information.


Network and Internet ▸ Network and Sharing Center
Search Control Panel
Connect to a Workplace
Type your user name and password
User name:
trainer
Password:
Show characters
Remember this password
Domain (optional):
ACCUSOURCE
Connect
Cancel
See full map
Windows Firewall
Diagnose and repair network problems, or get troubleshooting information.

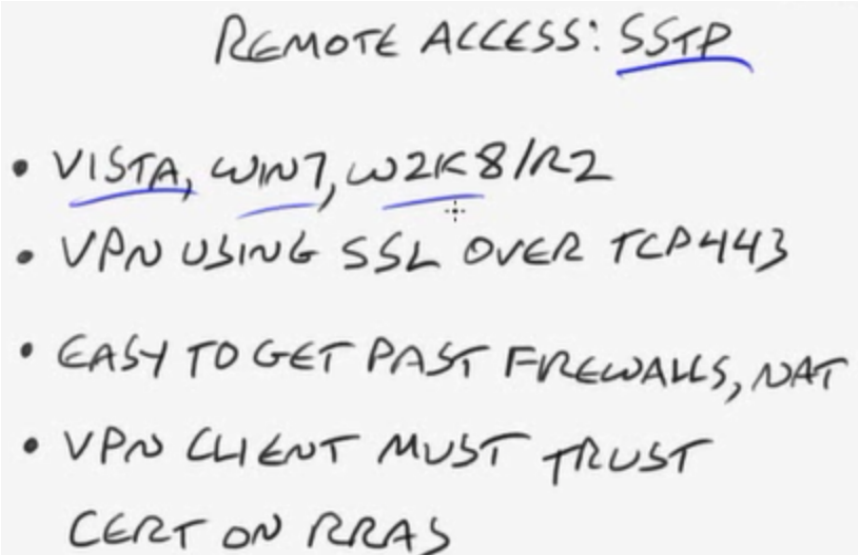

Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize
Local Area Connection
Network
VPN Connection Status
General
Details
Property
Value
Device Name
WAN Miniport (PPTP)
Device Type
vpn
Authentication
MS CHAP V2
Encryption
MPPE 128
Compression
(none)
PPP multilink framing
Off
Client IPv4 address
169.254.38.179
Server IPv4 address
169.254.82.24
NAP State
Not NAP-capable
Origin address
(unknown)
Destination address
10.10.10.5
Close


Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize
Local Area Connection
Network
Intel(R) PRO/1000 MT Network C...
VPN Connection
VPN Connection
WAN Miniport (PPTP)
Currently connected to:
Network
Internet access
VPN Connection
No Internet access
Dial-up and VPN
VPN Connection
Connected
Disconnect
Open Network and Sharing Center

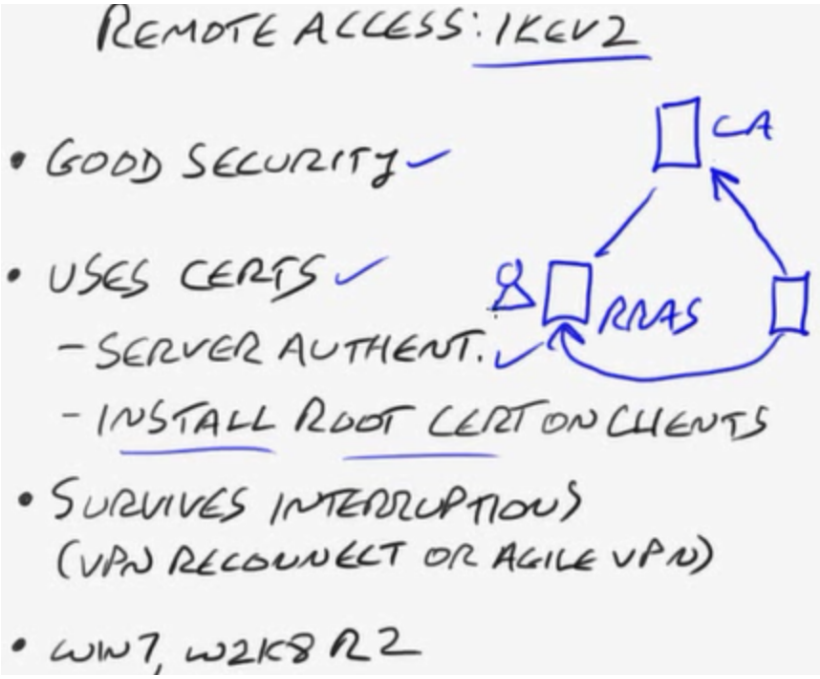

VPN Connection Properties
General
Options
Security
Networking
Sharing
Type of VPN:
Automatic
Automatic
Point to Point Tunneling Protocol (PPTP)
Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)
Secure Socket Tunneling Protocol (SSTP)
IKEv2
Authentication
Use Extensible Authentication Protocol (EAP)
Properties
Allow these protocols
EAP-MSCHAPv2 will be used for IKEv2 VPN type. Select any of these protocols for other VPN types.
Unencrypted password (PAP)
Challenge Handshake Authentication Protocol (CHAP)
Microsoft CHAP Version 2 (MS-CHAP v2)
Automatically use my Windows logon name and password (and domain, if any)
OK
Cancel
Organize
Start this connect
Local Area Connection
Network
Intel(R) PRO/1000 MT Ne



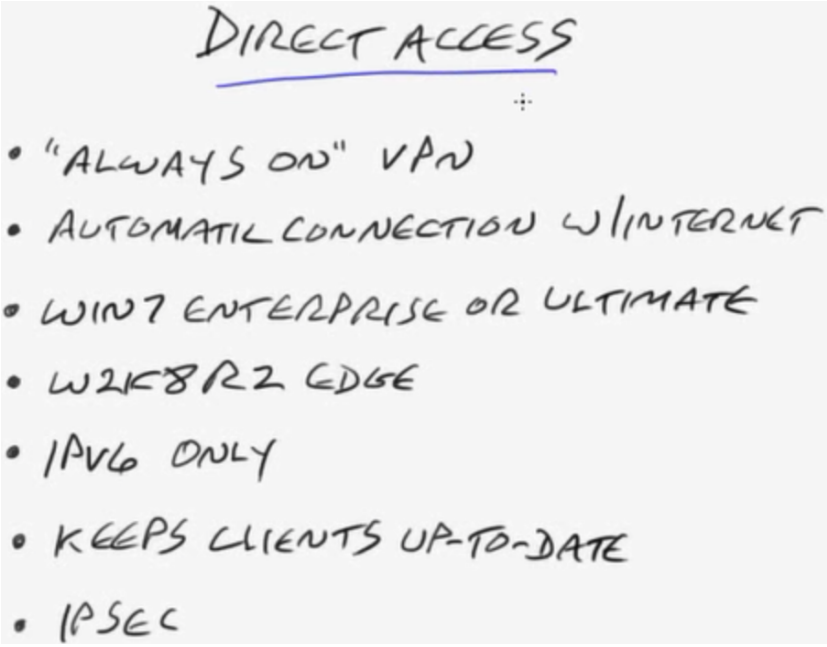
->L2TP(Layer 2 Tunneling Protocol)
->you need to open firewall ports



->SSTP(Secure socket Tunneling protocol)



->IKE(Internet Key exchange v2)



(Windows MS DOS Command Prompt)

```
C:\>nslookup www.google.com
C:\>ipconfig /all
C:\>ipconfig
C:\>ipconfig /displaydns
C:\>ipconfig /flushdns
C:\>ipconfig /release
C:\>ipconfig /renew
C:\>hostname
C:\>arp -a (to check arp cache)
C:\>route print (to check computers routing table)
C:\>route add 96.0.0.0 mask 255.0.0.0 192.168.1.1 metric 2 if
1
```

```
C:\>ping 127.0.0.0 (to check tcp stack loopback test)
C:\>ping ::1  (loopback test for ipv6)
C:\>ping 192.168.1.1  or C:\>ping google.com
C:\>ping google.com -t (unlimited ping)
C:\>ping google.com -n 10 (number of counts)
C:\>ping google.com -n 10 -l 10000  (count 5 and 10000 bytes
size)
C:\>ping -a 10.1.1.1  (gives FQDN)
C:\>tracert 192.168.1.1 or C:\>tracert google.com
C:\>telnet 192.168.1.1
```