# 38. DNS (Domain Name System)

THE PURPOSE OF DNS

- DNS is used to *resolve* human-readable names (google.com) to IP ADDRESSES
- Machines such as PCs don't use names, they use ADDRESSES (ie: IPv4/IPv6)
- Names are much easier for us to use and remember than IP ADDRESSES
  - What is the IP ADDRESS of youtube.com ?
- When you type 'youtube.com' into a web browser, your device will ask a DNS SERVER for the IP ADDRESS of youtube.com
- The DNS SERVER(S) your DEVICE uses can be manually configured or learned via DHCP

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BASIC FUNCTIONS OF DNS

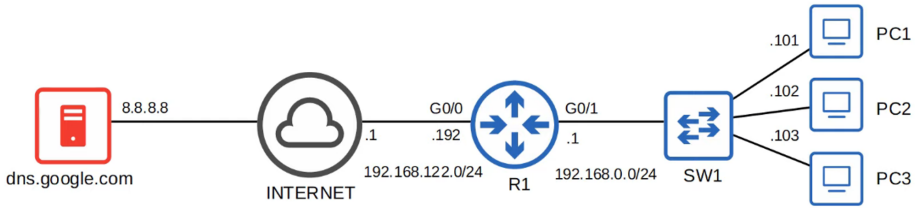


Figure 1: image

Command `ipconfig /all` (Show local IP configuration on current DEVICE)

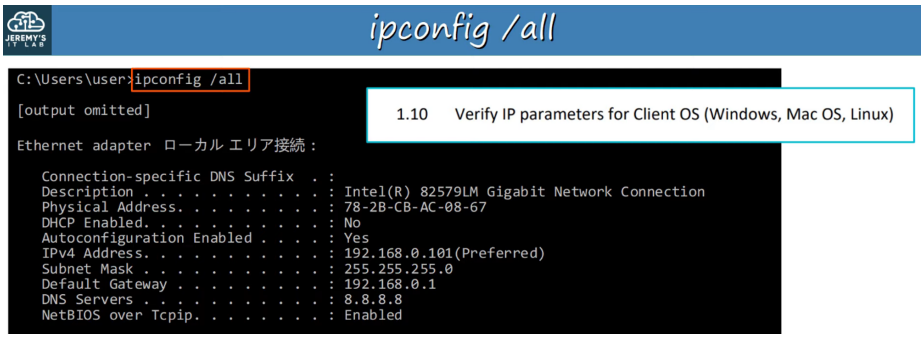


Figure 2: image

Command `nslookup` (Shows IP information for a given DNS entry)

WIRESHARK CAPTURE of above COMMANDS

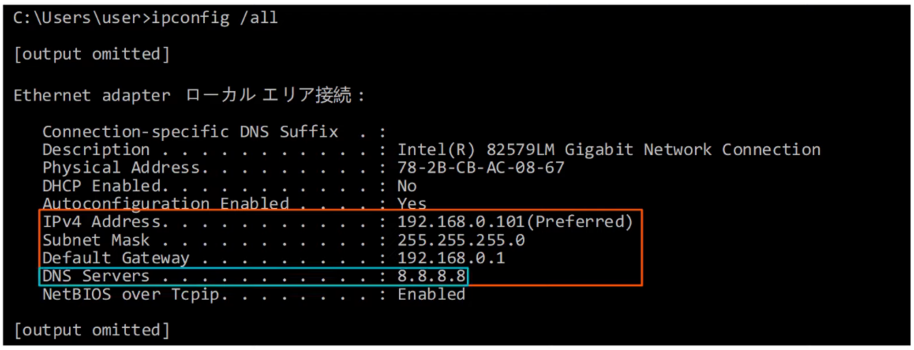


Figure 3: image

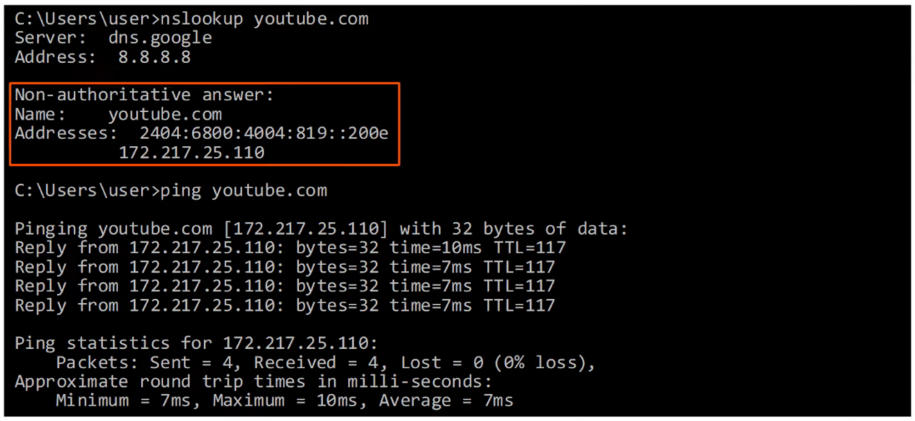


Figure 4: image

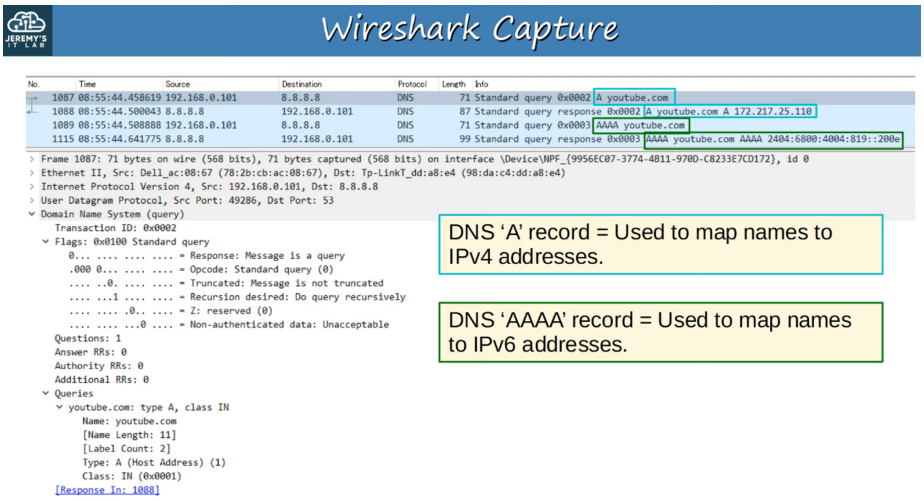


Figure 5: image

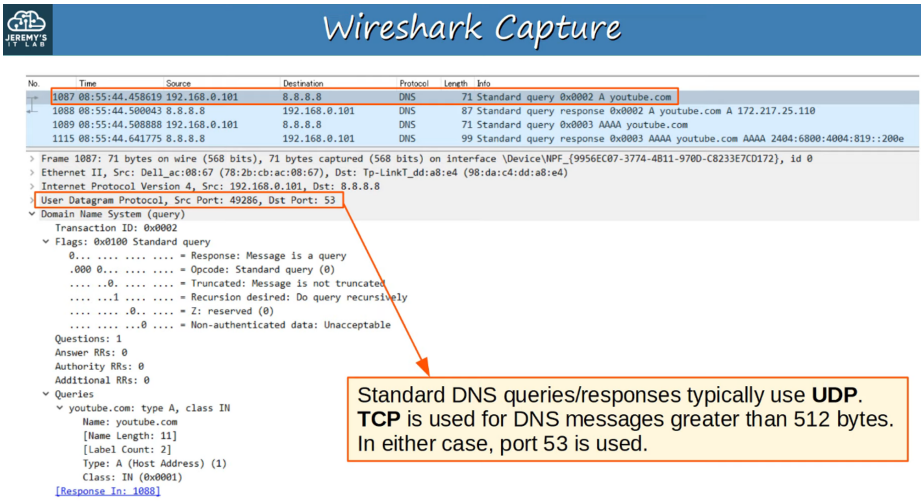


Figure 6: image


Figure 7: image

Command `ipconfig /displaydns` (Displays DNS cache)

Command `ipconfig /flushdns` (Clears DNS cache)

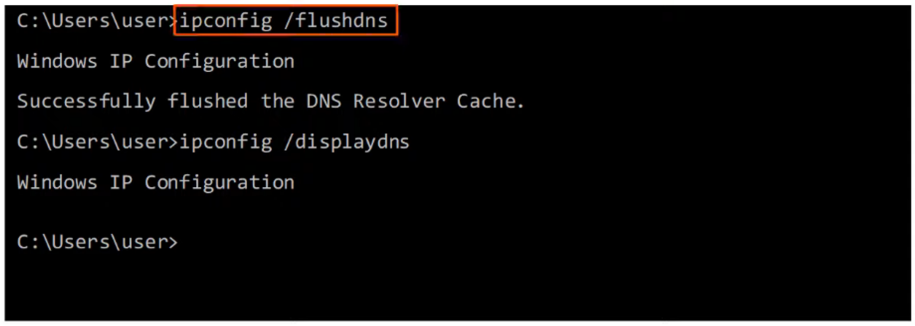


Figure 8: image

HOSTS Files

WINDOWS HOSTS location

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CONFIGURING DNS IN CISCO IOS

- For HOSTS in a NETWORK to use DNS, you don't need to configure DNS on the ROUTERS.
  - They will simply FORWARD the DNS messages like any other packets
- However, a CISCO ROUTER can be configured as a DNS SERVER, although it's rare
  - If an INTERNAL DNS SERVER is used, usually it's a WINDOWS or LINUX SERVER
- A CISCO ROUTER can also be configured as a DNS CLIENT

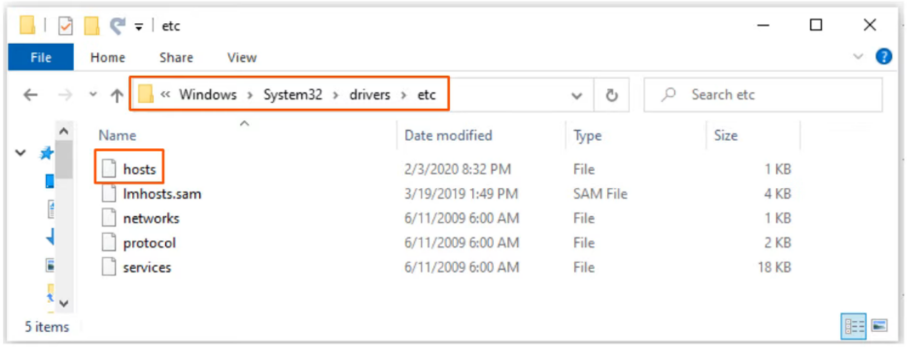


Figure 9: image

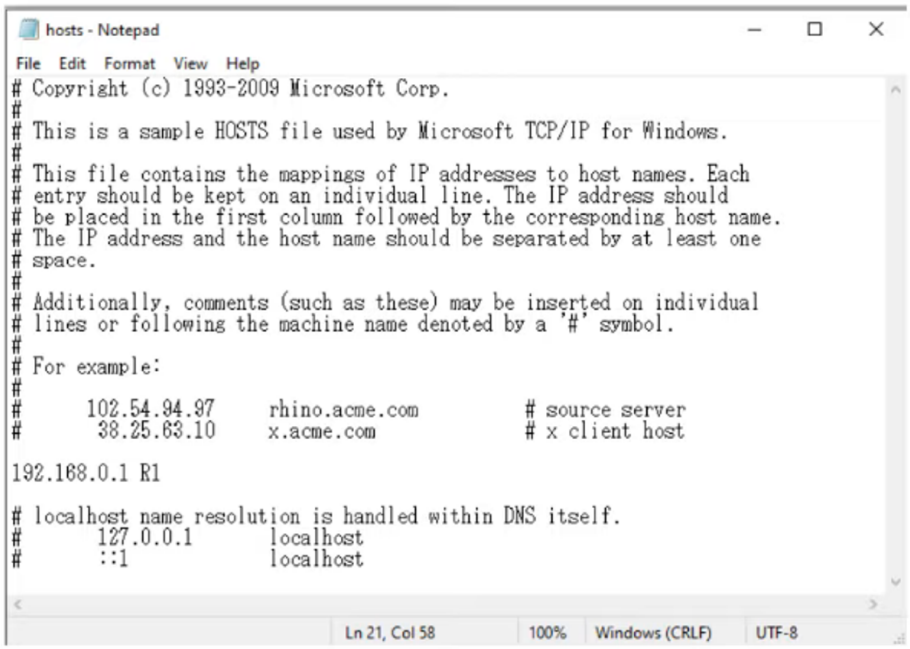


Figure 10: image

Command `ip dns server` and `ip host <hostname> <ip address>`

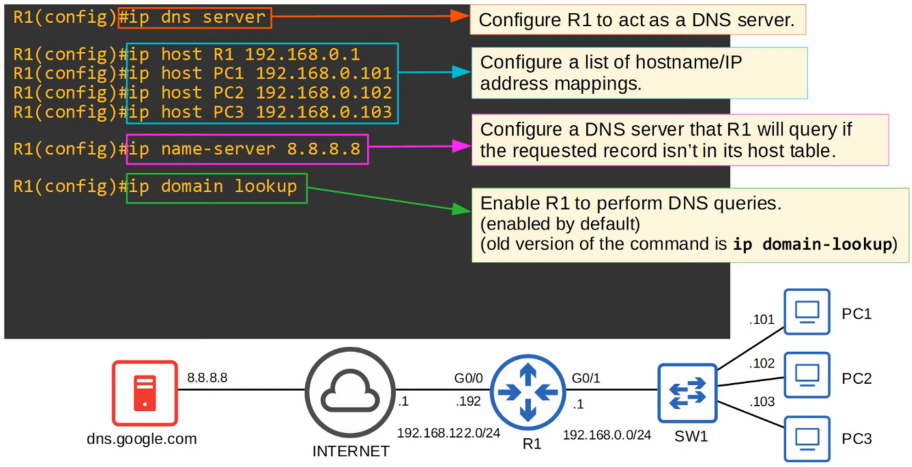


Figure 11: image

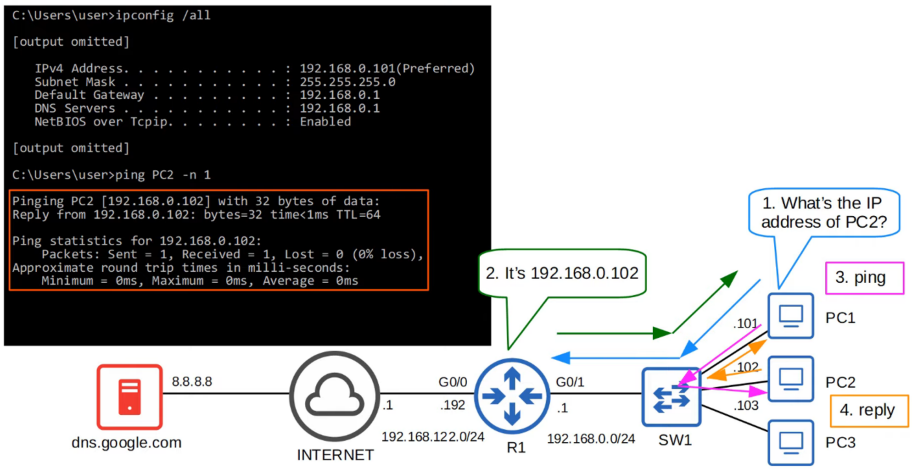


Figure 12: image

Command `show hosts`

Command `ip name-server` and `ip domain lookup`

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COMMAND REVIEW:

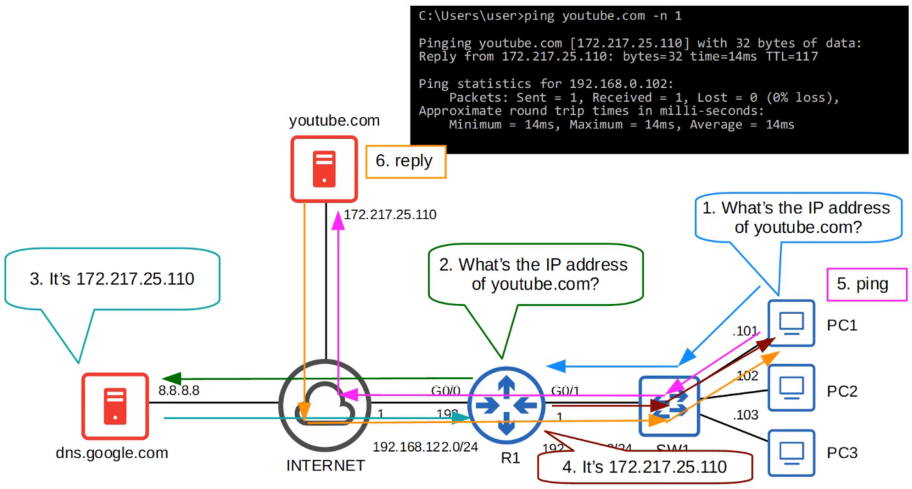


Figure 13: image

```
R1#show hosts
Default domain is not set
Name/address lookup uses domain service
Name servers are 8.8.8.8

Codes: UN - unknown, EX - expired, OK - OK, ?? - revalidate
       temp - temporary, perm - permanent
       NA - Not Applicable None - Not defined

Host                      Port  Flags      Age Type   Address(es)
youtube.com               None  (temp, OK)  0   IP     172.217.25.110
R1                        None  (perm, OK)  4   IP     192.168.0.1
PC1                       None  (perm, OK)  1   IP     192.168.0.101
PC2                       None  (perm, OK)  4   IP     192.168.0.102
PC3                       None  (perm, OK)  4   IP     192.168.0.103
```

Figure 14: image

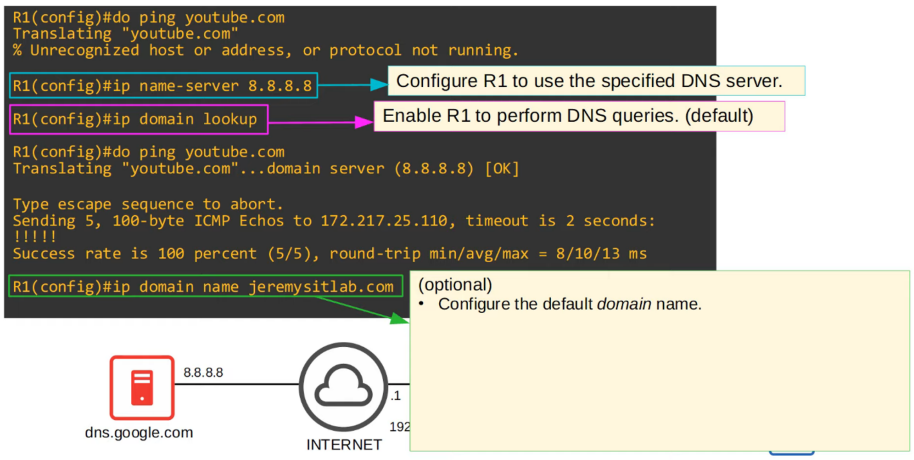


Figure 15: image


Figure 16: image