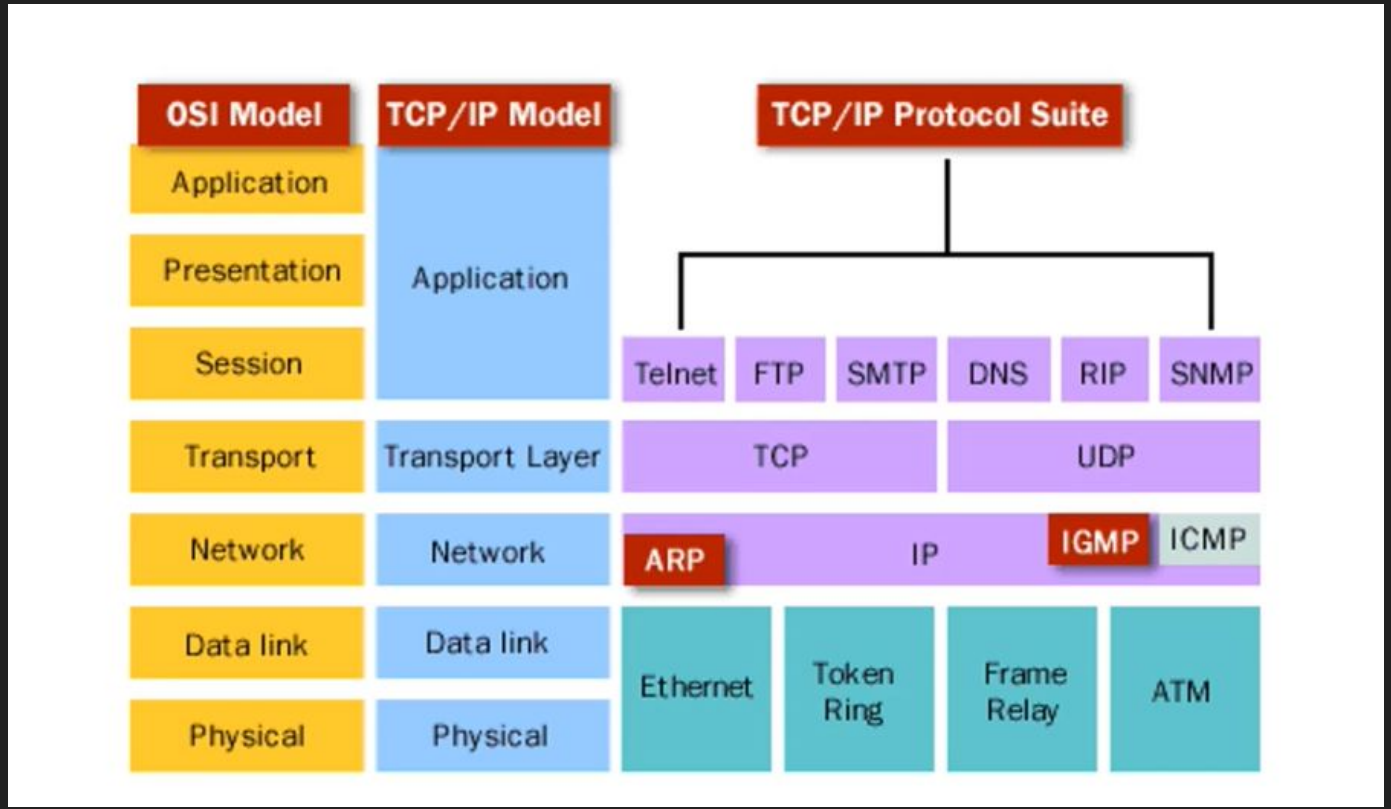
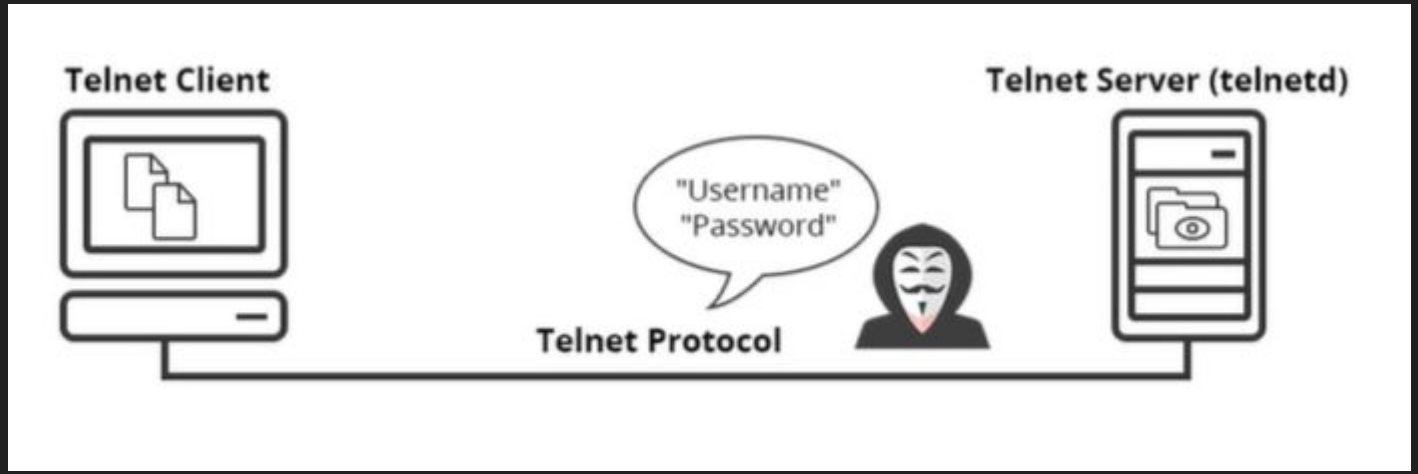
Chapter 2 - TCP/IP Protocol Suite 2

TCP/IP Model & Protocol Suite



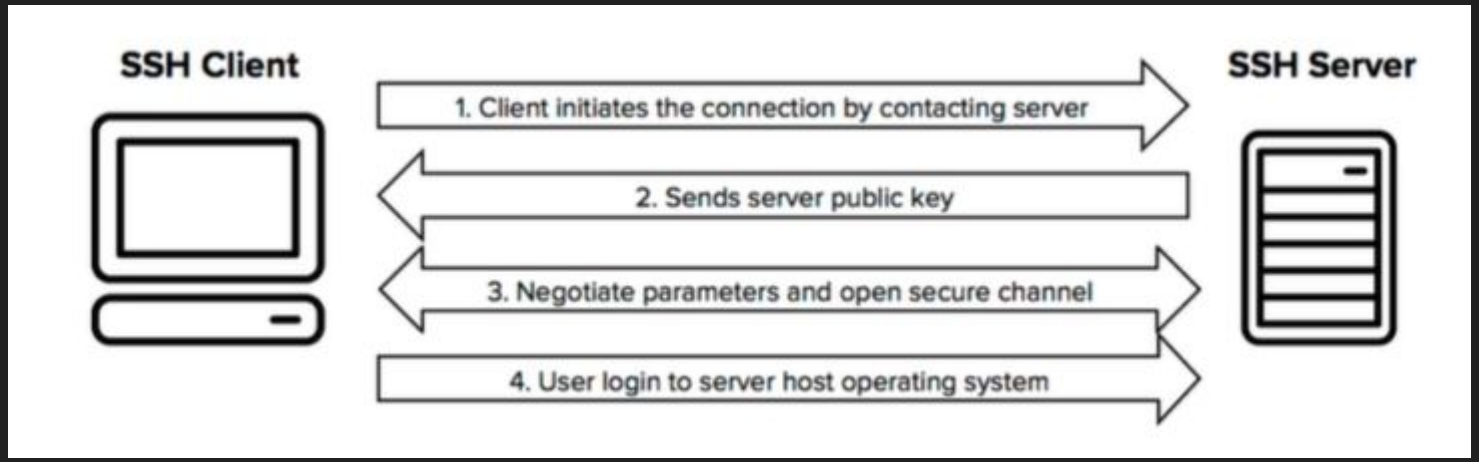
Telnet

- One of the first Internet standards, developed in 1969 最早的互联网协议之一，开发于1969年
- Telnet is terminal emulation, a virtual terminal that can interact with the chosen remote host Telnet是一个虚拟终端，它能和选中的远程主机进行互动
- Allow Telnet Client to access the resources of Telnet Server 允许Telnet用户访问Telnet服务器的资源
- There are **no encryption** including passwords **它没有任何加密**（包括密码）
- Users begin a Telnet session by running the Telnet client software and then logging and then logging into the Telnet server 用户开始一个Telnet会话，通过使用Telnet客户端，然后登录进Telnet服务器



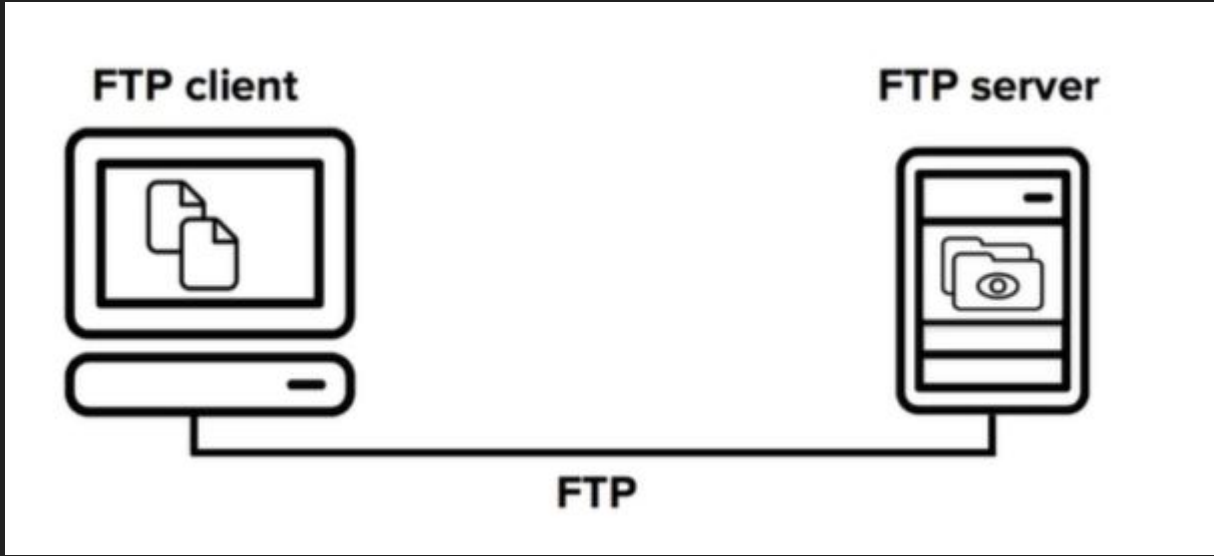
SSH

- SSH sets up a secure session (encrypted) SSH建立一个安全的会话（加密）



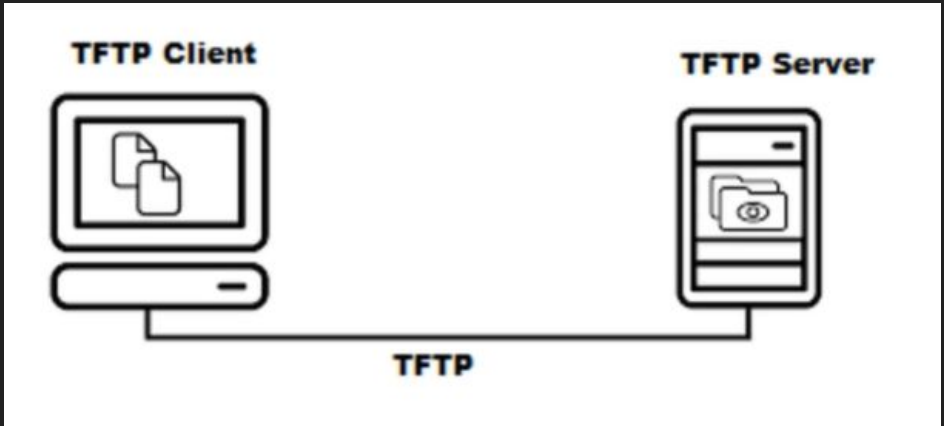
FTP

- Transfer files 文件传输
- Allows for access to both directories 允许访问其目录

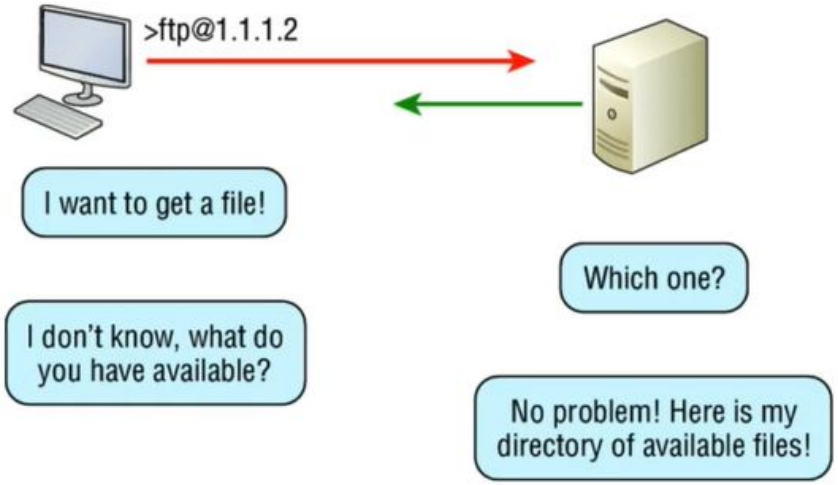


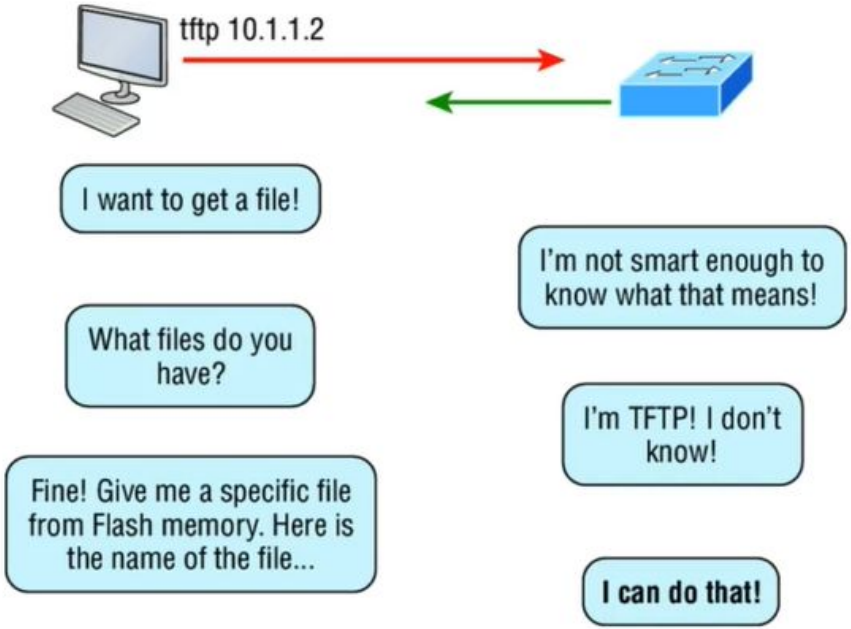
TFTP

- TFTP is the stripped-down, stock version of FTP TFTP是FTP的简化版
- TFTP has no directory-browsing abilities, means it can only send and receive files TFTP没有访问目录的能力，意思是它只能发送和接收文件
- TFTP can be easily implemented by small footprint code for network booting strategy like BOOTP, PXE, BSDP TFTP能被小内容占用的代码实现，用于引导策略



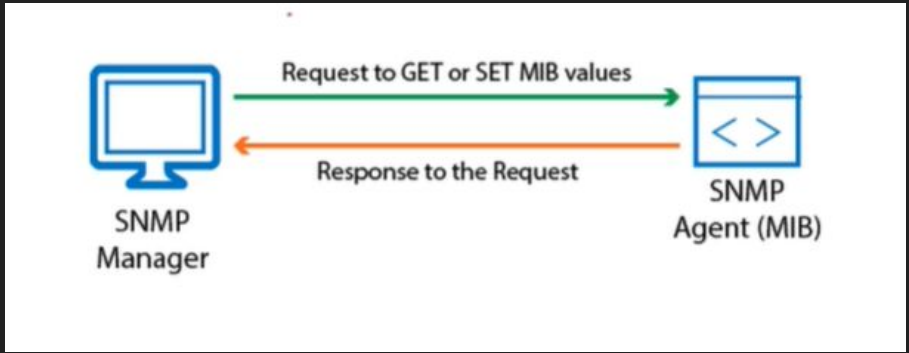
FTP vs TFTP


>ftp@1.1.1.2
I want to get a file!
Which one?
I don't know, what do you have available?
No problem! Here is my directory of available files!

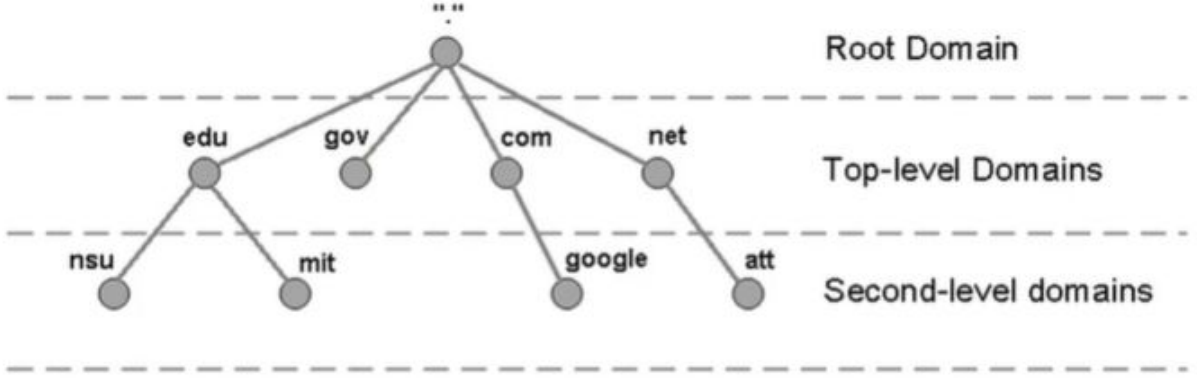

tftp 10.1.1.2
I want to get a file!
I'm not smart enough to know what that means!
What files do you have?
I'm TFTP! I don't know!
Fine! Give me a specific file from Flash memory. Here is the name of the file...
I can do that!

SNMP

- Gather data by polling the devices on the network from a network management station (NMS) 通过从网络管理站(NMS)轮询网络上的设备来收集数据
- Network devices can inform the NMS station about problems as they occur by sending SNMP Traps 网络设备可以通过发送SNMP陷阱来通知NMS站有关问题的发生
- MIB (Management Information Base) is a collection of definitions that define the properties of the managed object within the device to be managed MIB(管理信息库)是定义的集合，这些定义定义了要管理的设备内被管理对象的属性



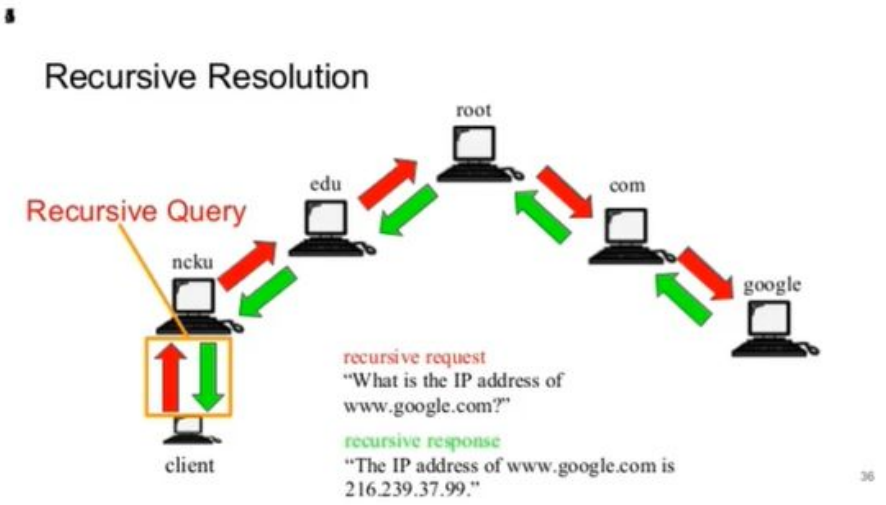
DNS Domain Namespace

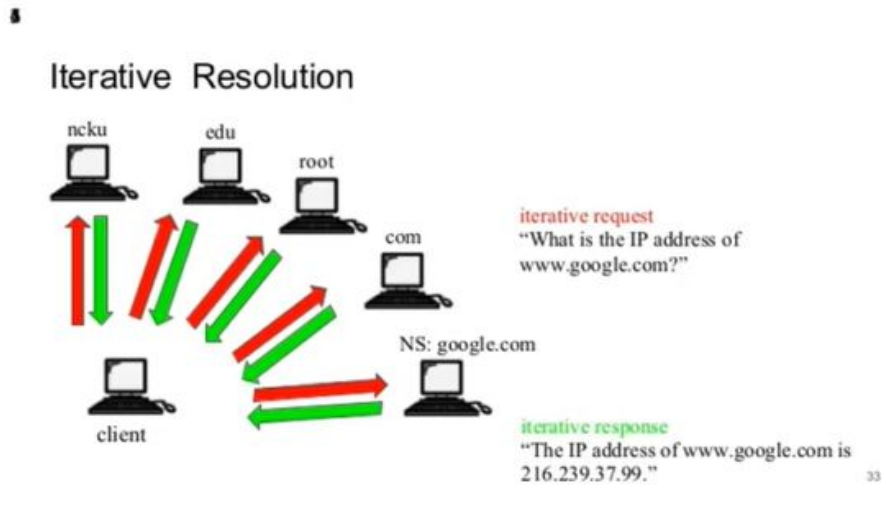


The 13 root name servers are operated by 12 independent organisations.
http://www.root-servers.org/

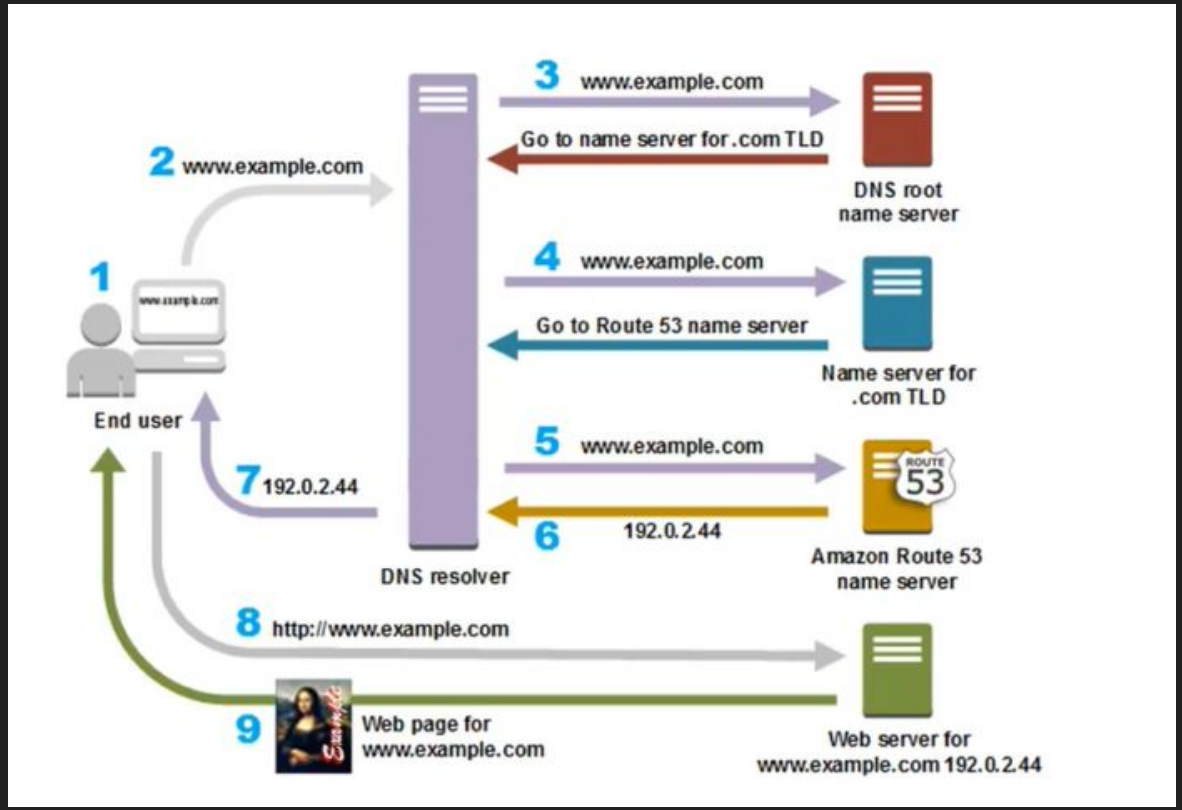
- Resolves hostnames
- A record – Name to IP
- PTR record – IP to Name

DNS Recursive vs Iterative Query



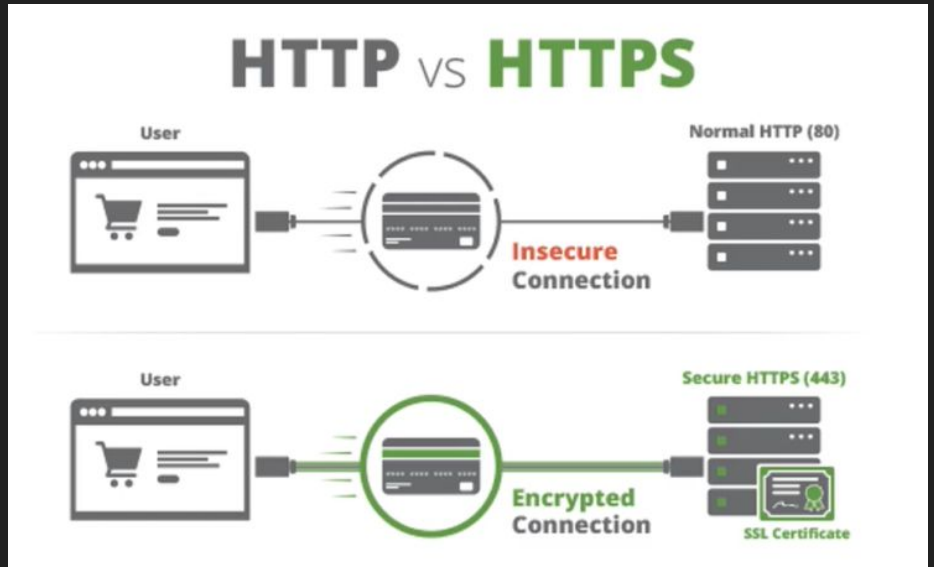


DNS Recursive & Iterative Query



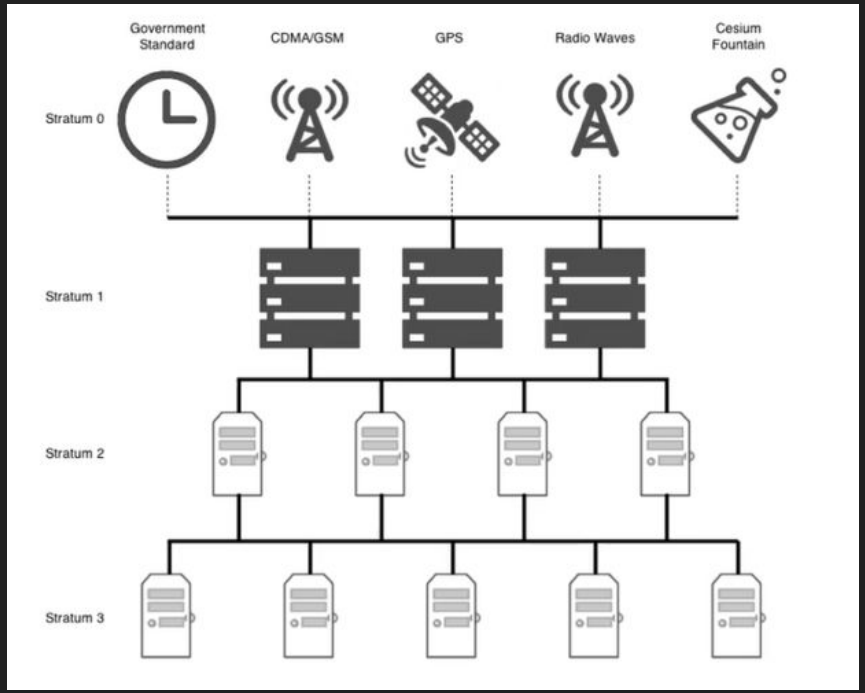
HTTP/HTTPS

- Manage communications between web browsers and web servers 管理Web浏览器和Web服务器之间的通信
- HTTPS uses Secure Sockets layer (SSL) to provide secure communication HTTPS使用安全通信端层（SSL）提供安全的通信



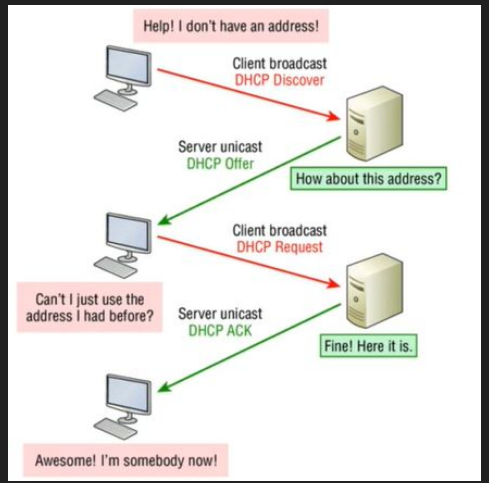
NTP

- Synchronise the clocks on our computers to one standard time source 将计算机上的时钟同步到一个标准时间源



BootP/DHCP/APIPA

- Both can assign IP addresses to hosts 两者都可以为主机分配IP地址
- BootP assigns an IP address to a host but the host's hardware address must be entered manually in a BootP table BootP为主机分配IP地址，但是必须要在BootP表中手动输入主机的硬件地址
- A client that sends out a DHCP Discover message in order to receive an IP address sends out a broadcast at both layer 2 and layer 3 发送DHCP发现消息以接收IP地址的客户端在第2层和第3层均发出广播



- Windows operating systems provide a feature called Automatic Private IP Addressing (APIPA) Windows操作系统提供了一项称为自动专用IP寻址（APIPA）的功能。
- With APIPA, clients can automatically self-configure an IP address and subnet mask when DHCP server isn't available 借助APIPA，当DHCP服务器不可用时，客户端可以自动自配置IP地址和子网掩码
- 169.254.0.1 - 169.254.255.254