



Chapter 15

THE APPLICATION LAYER



THE BASIC OF THE APPLICATION LAYER

► Functions

- The application layer (Layer 7) supports the communicating component of an application.
- The application layer:
 - Identifies and establishes the availability of intended communication partners.
 - Synchronizes cooperating applications.
 - Establishes agreement on procedures for error recovery and control of data integrity.

► **Characteristics**

- **The application layer does not provide services to any other OSI layer.**
- **However, it does provide services to application processes lying outside the scope of the OSI model.**
- **Example :**
 - **Browser, Email, FTP, Telnet ...**

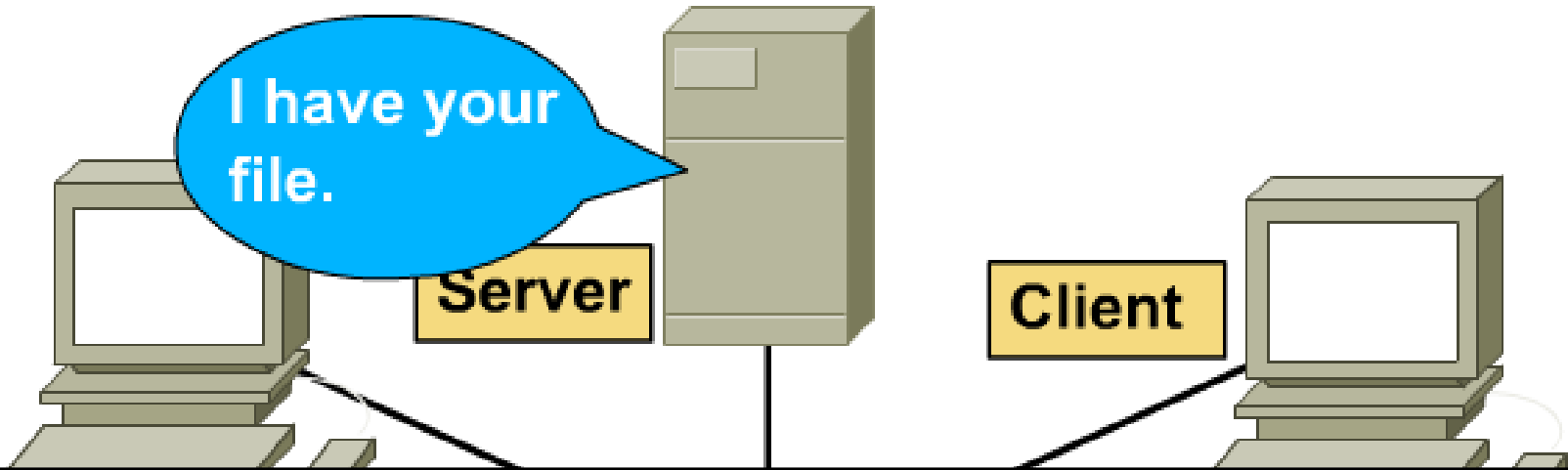
► Interfaces

- **Direct network application:**
 - The application layer provides a direct interface for the rest of the OSI model by using network applications.
 - Client server: WEB, FTP, Mail ...
- **Indirect network application:**
 - The application layer provides a an indirect interface for the rest of the OSI model by using standalone applications.
 - Redirector: word processor, network driver, network printer ...

► **Redirector**

- **Redirector works with computer OS instead of specific application programs.**
- **Redirector allows to assign remote resources to logical names on the local computer.**
- **Examples of redirectors are:**
 - **NetBEUI.**
 - **Novell IPX/SPX.**
 - **NFS in TCP/IP.**

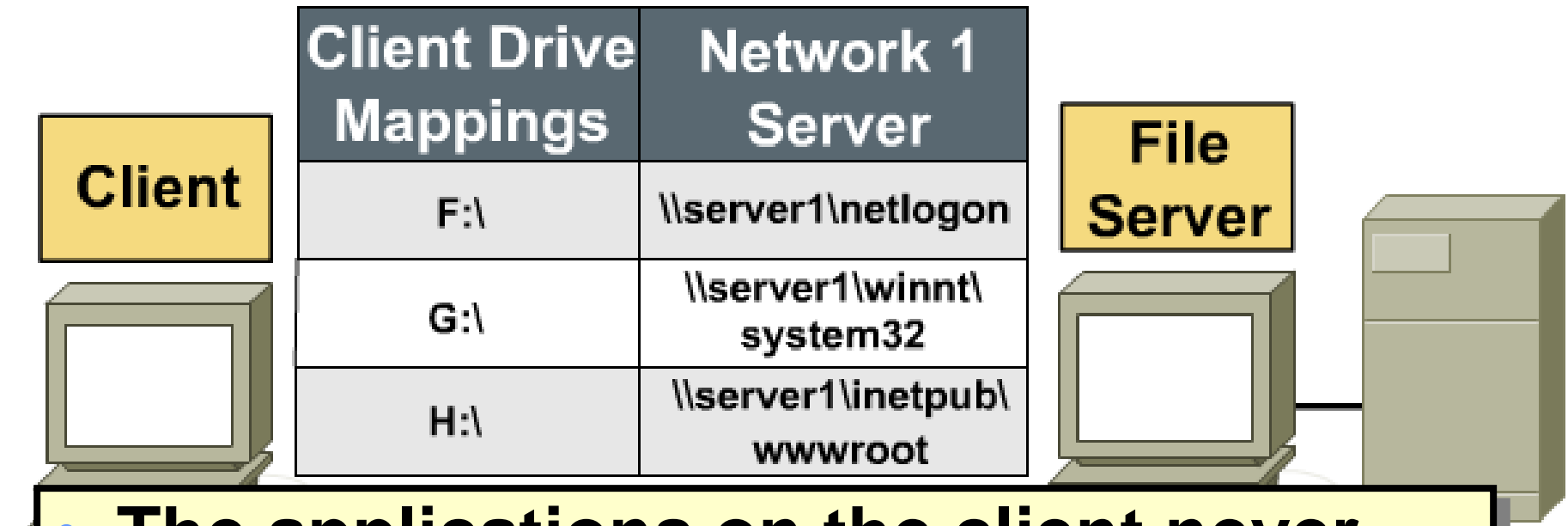
► Client-Server application



- The **client side** is located on the local computer and is the requestor of the services.
- The **server side** is located on a remote computer and provides services in response to the client's requests.

▶ Network driver

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- The applications on the client never have to recognize the network.
- Redirectors expand the capabilities of non-network software.

► **Make and Break a connection**

- **The connection to the server was maintained only long enough to process the **transaction**.**
 - **Example : WWW, E-mail ...**
- **The connection to the server was maintained until the user determines that he/she has finished.**
 - **Example : FTP, Telnet ...**



NETWORK APPLICATIONS

► **Application protocols**

- **DNS**
- **E-mail**
- **Telnet**
- **FTP**
- **WWW**
- **...**

► **DNS: Problems with using IP address**

192.31.7.130

CISCO.COM

204.71.177.35

YAHOO.COM

152.163.210.7

AOL.COM

198.150.15.234

MAT-MADISON.COM

207.46.131.15

MICROSOFT.COM

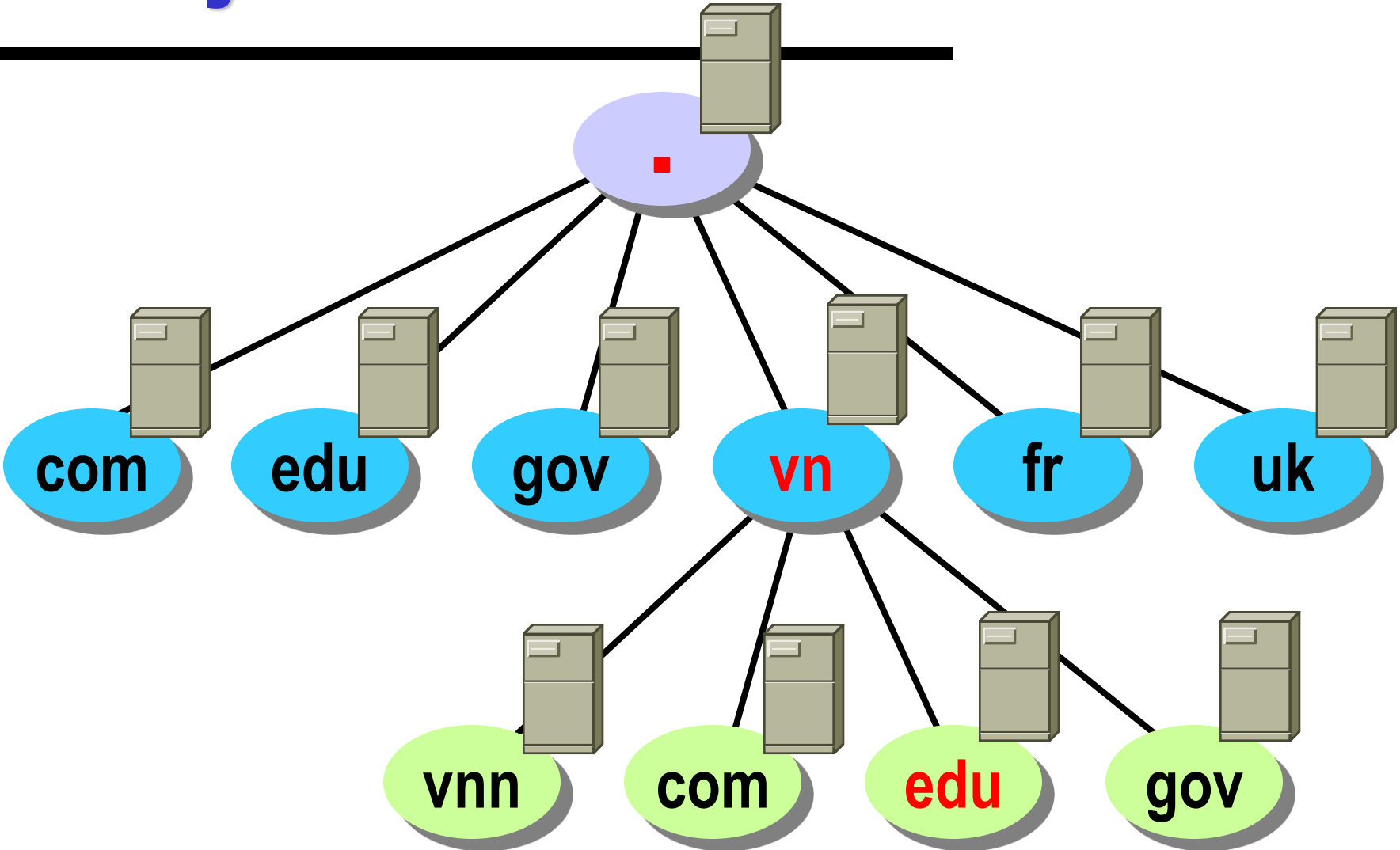
192.233.80.9

NOVELL.COM

- **The DNS server is a device on a network that manages domain names and responds to requests from clients to translate a domain name into the associated IP address.**
- **The DNS system is set up in a hierarchy that creates different levels of DNS servers.**

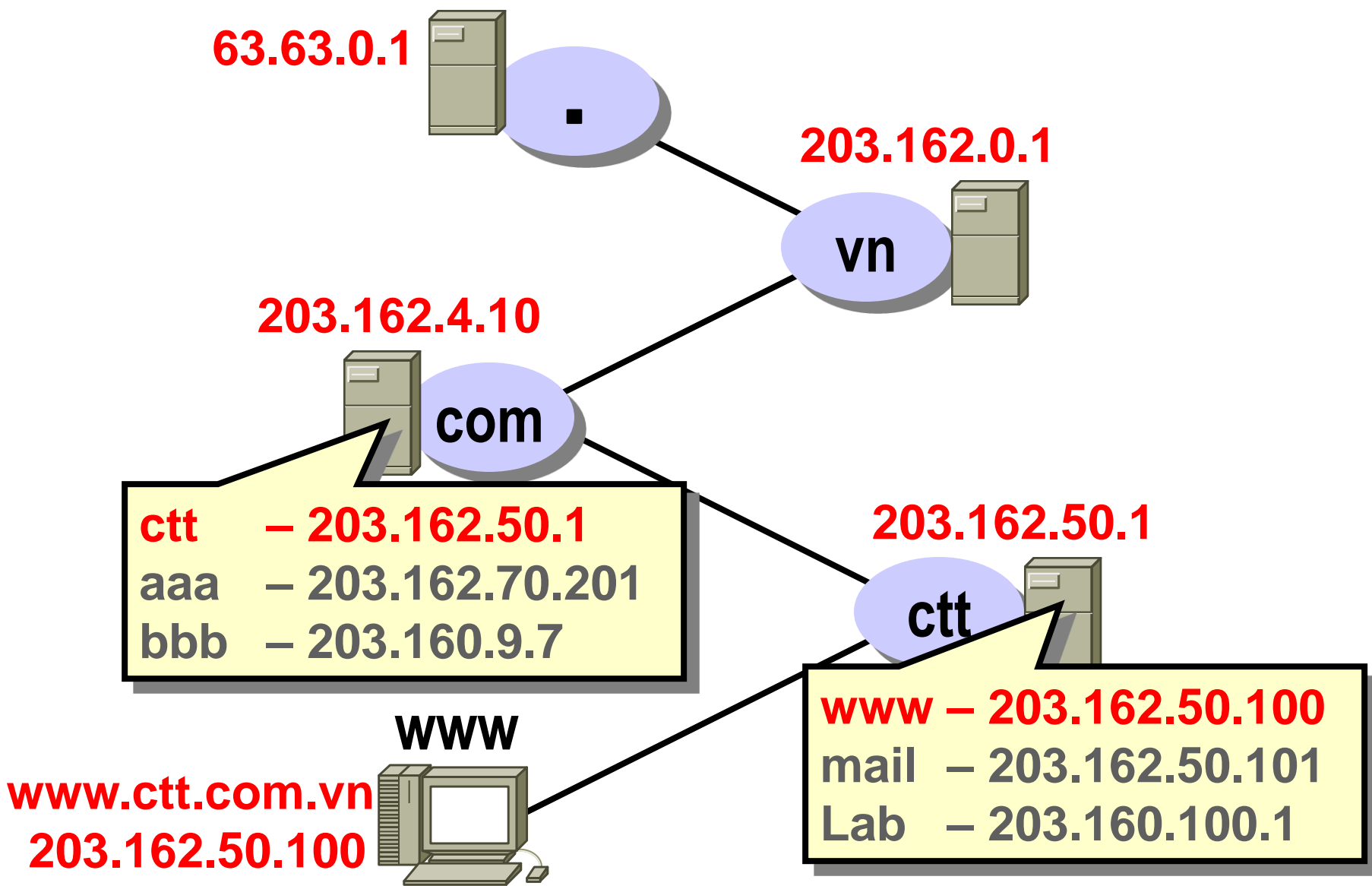
► DNS: System

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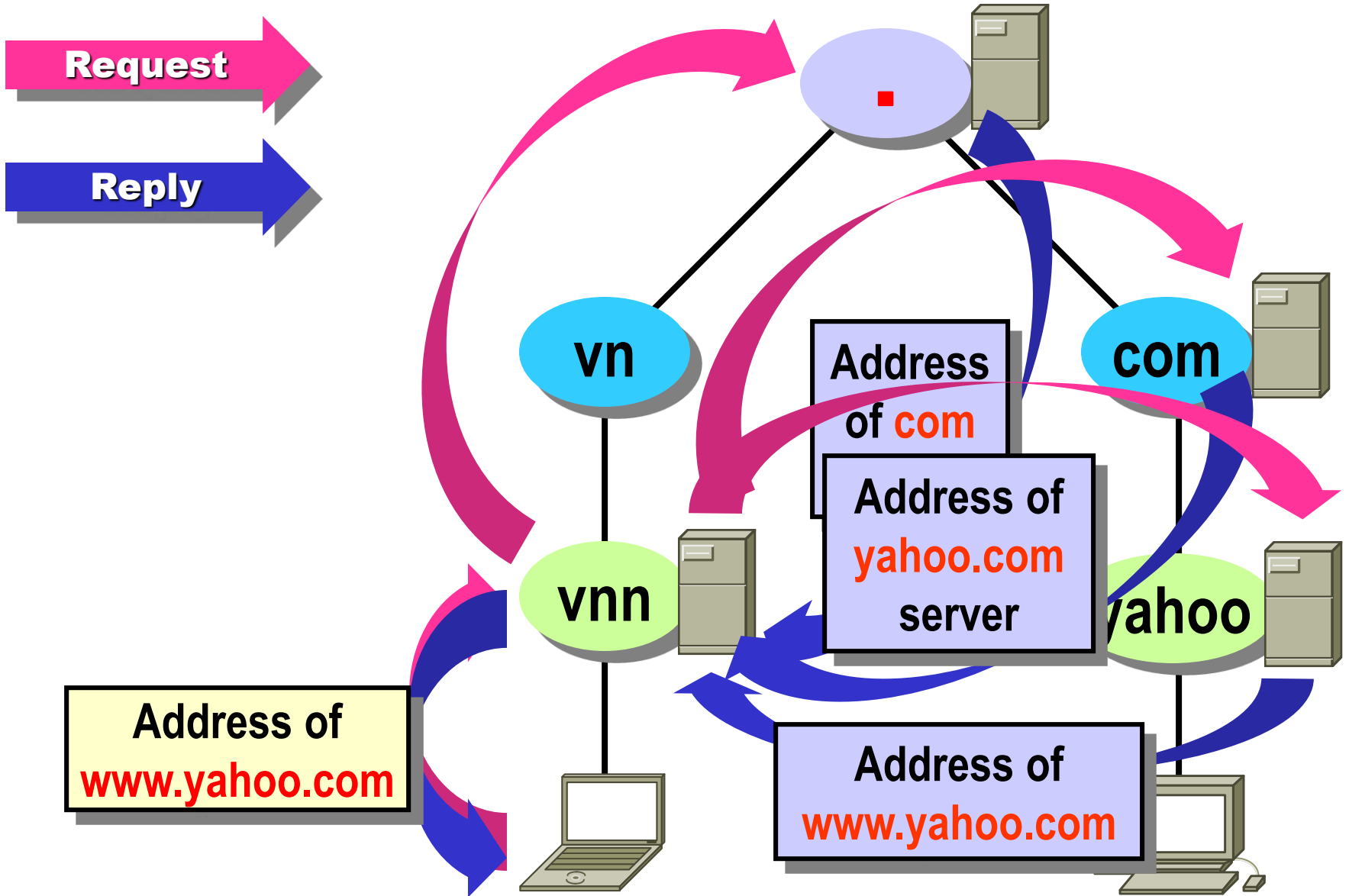


► DNS: Database

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► DNS: Resolve `www.yahoo.com`



► Email

- E-mail client applications, such as Eudora, Outlook Express, and Netscape Mail, work with the POP3 protocol.
- For security, when message recipients check their e-mail they are often prompted for a password. The password can also be saved in many e-mail programs.
- An e-mail address consists of the recipient's username and post-office address: **ctt@yahoo.com**.

- **Telnet software provides the ability to remotely access another computer.**
- **The Telnet application works mainly at the application, presentation and session layers of the OSI model.**

- **FTP is designed to download files or upload files on the Internet.**
- **An FTP session is established the same way in which a Telnet session is established. Just like Telnet, the FTP session is maintained until the client terminates it, or there is some sort of communication error.**

- **Web pages are created with a format language called Hypertext Markup Language (HTML).**
- **Hyperlinks make the World Wide Web easy to navigate. A hyperlink is an object on a Web page that, when clicked, transfers you to a new Web page.**