COMPUTER SCIENCE

Basic Networking Concepts

1. Introduction

2. Protocols

3. Protocol Layers

4. Network Interconnection/Internet

1. **Introduction -A network can be defined as a group of computers and other devices connected in some ways so as to be able to exchange data. -Each of the devices on the network can be thought of as a node; each node has a unique address. -Addresses are numeric quantities that are easy for computers to work with, but not for humans to remember. Example: 204.160.241.98 -Some networks also provide names that humans can more easily remember than numbers. Example: www.javasoft.com, corresponding to the above numeric address. NIC addr1 NIC addrN NIC addr2 … 3 Addressing Internet address Consists of 4 bytes separated by periods Example: 136.102.233.49 -The R first bytes (R= 1,2,3) correspond to the network address; -The remaining H bytes (H = 3,2,1) are used for the host machine. -InterNIC Register: organization in charge of the allocation of the address ranges corresponding to networks. -Criteria considered: → Geographical area (country) → Organization, enterprise →**

Department → Host Domain Name System (DNS) -Mnemonic textual addresses are provided to facilitate the manipulation of internet addresses. -DNS servers are responsible for translating mnemonic textual Internet addresses into hard numeric Internet addresses. 4 Ports -An IP address identifies a host machine on the Internet. -An IP port will identify a specific application running on an Internet host machine. -A port is identified by a number, the port number. -The number of ports is not functionally limited, in contrast to serial communications where only 4 ports are allowed. -There are some port numbers which are dedicated for specific applications. Finger 79 Telnet 23 POP3 (e-mail) 110 SMTP (e-mail) 25 Gopher 70 FTP 20 and 21 HTTP 80 Applications Port numbers 5 Data Transmission -In modern networks, data are transferred using packet switching. -Messages are broken into units called packets, and sent from one computer to the other. -At the destination, data are extracted from one or

more packets and used to reconstruct the original message. - Each packet has a maximum size, and consists of a header and a data area. –

2. **The header contains the addresses of the source and destination computers and sequencing information necessary to reassemble the message at the destination. 1001….101 00010000111…000000110001100**