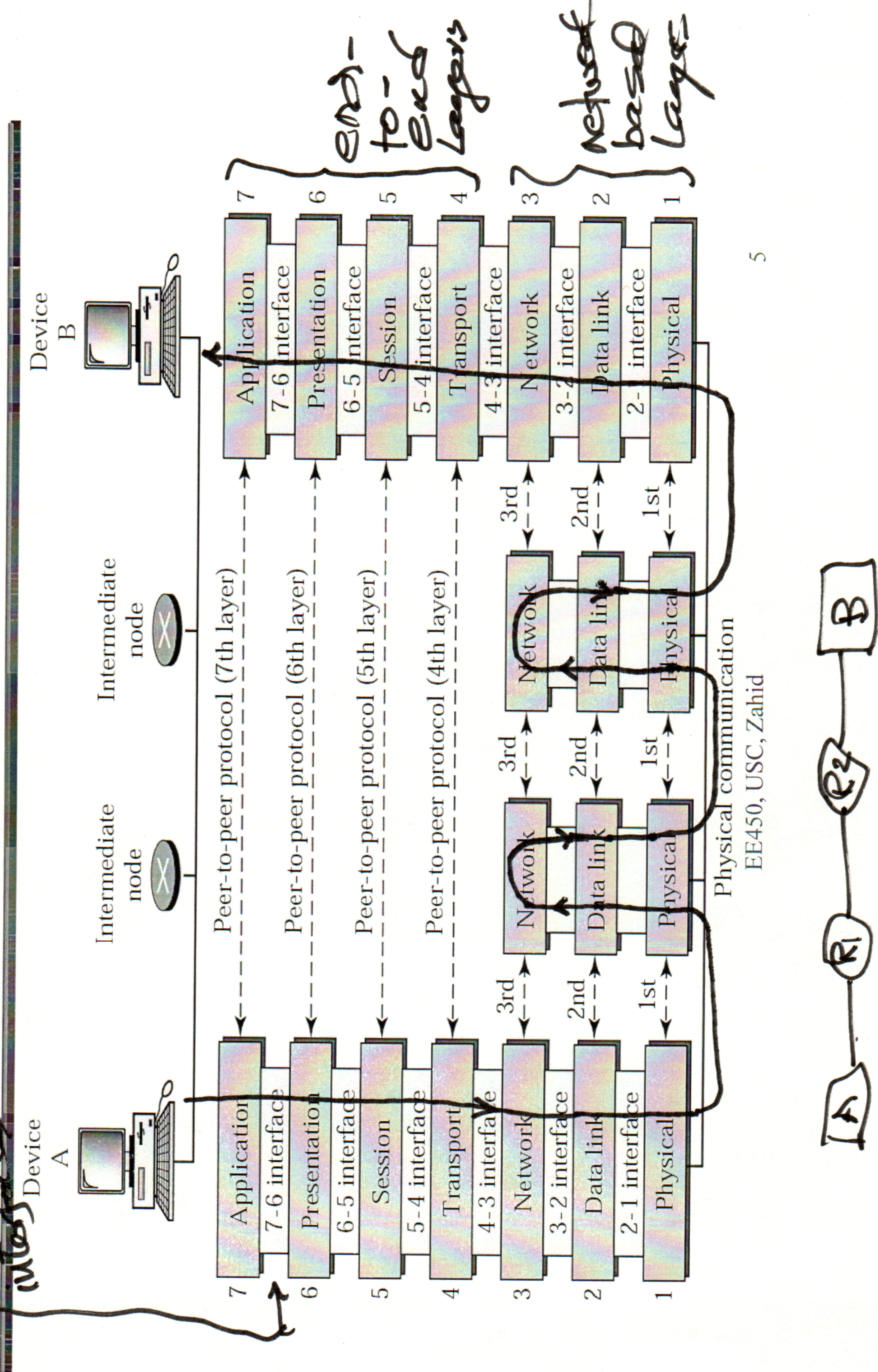
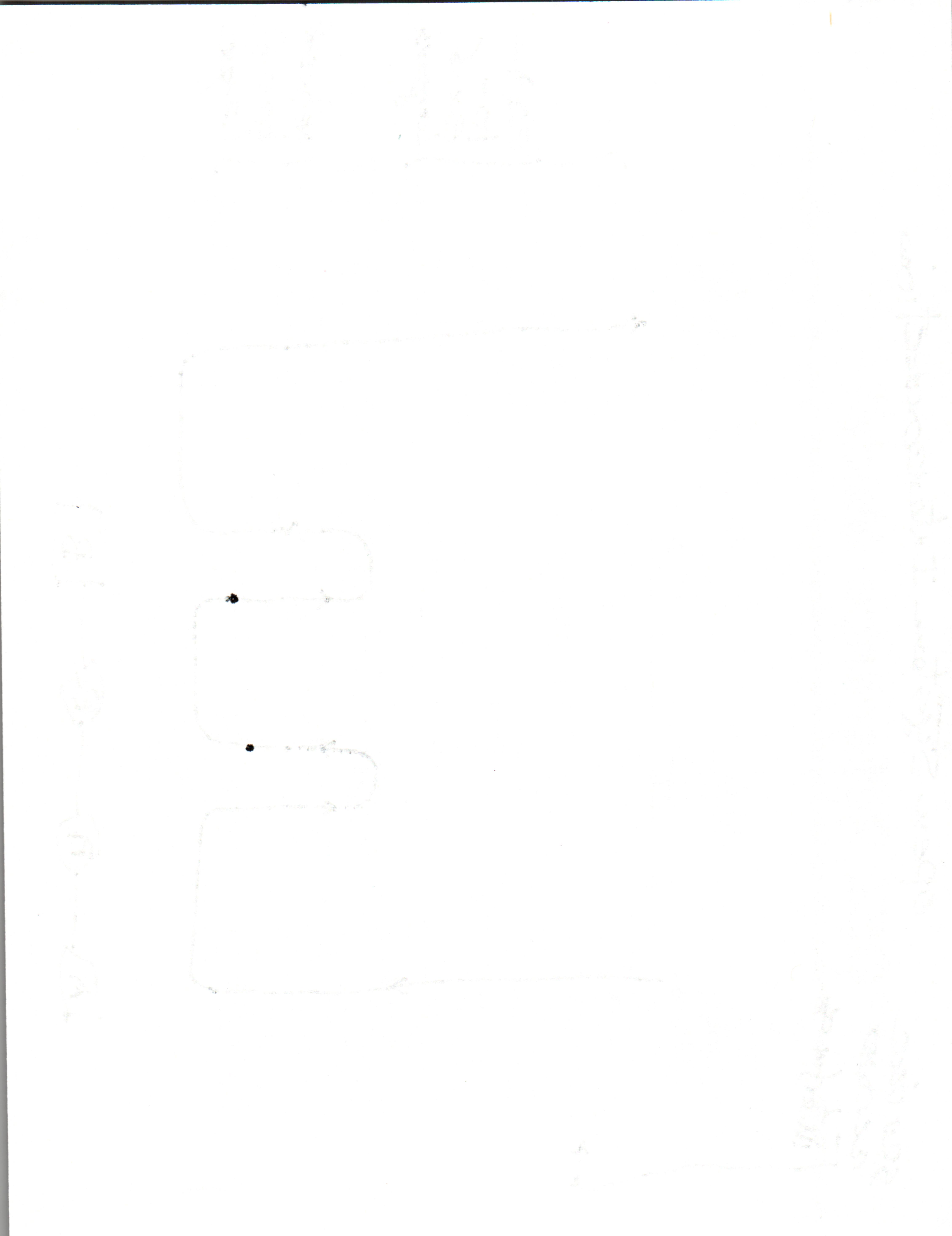
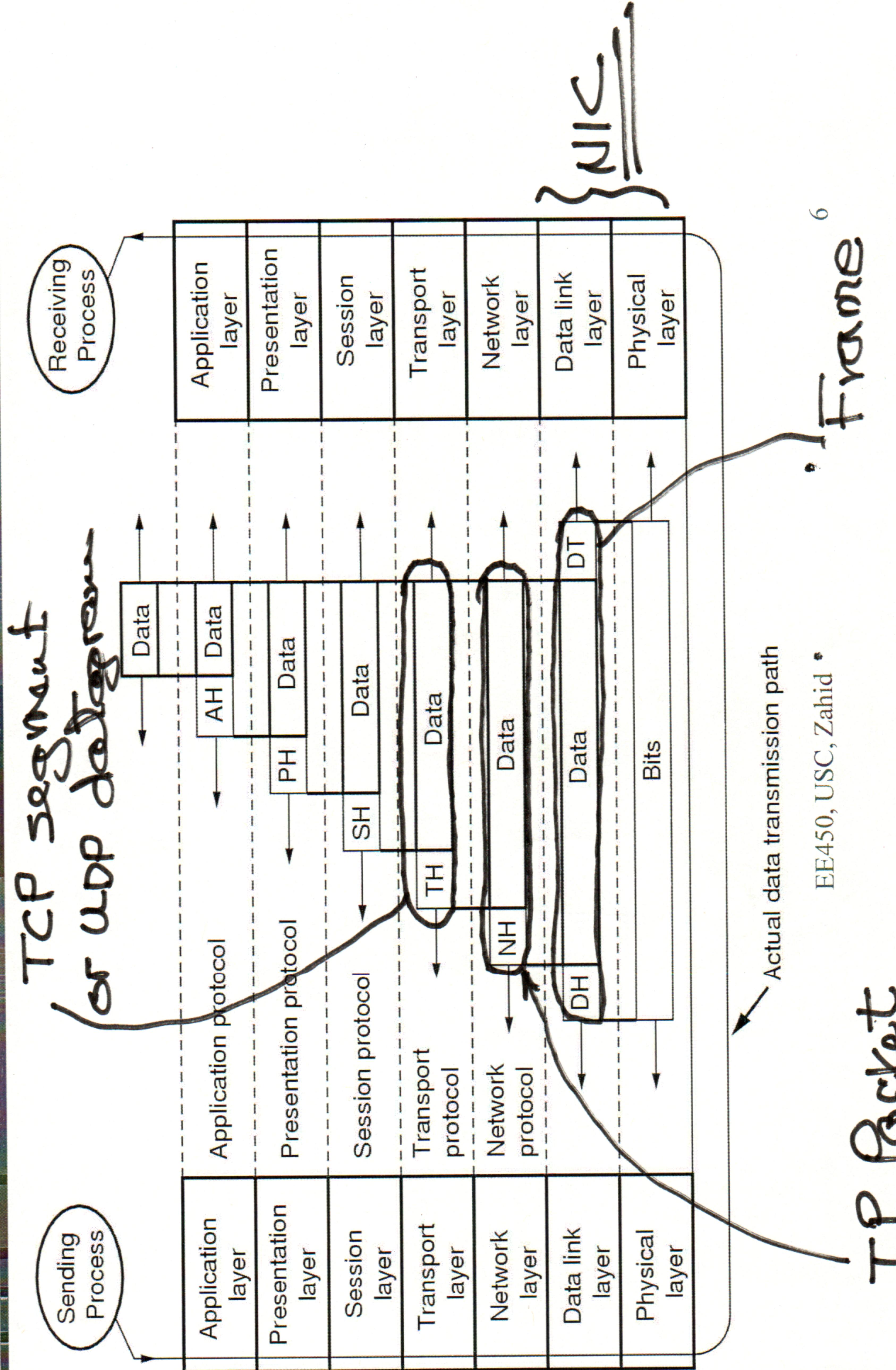


# open Systems Interconnection services over OSI Reference Model





# Data Transfer in OSI

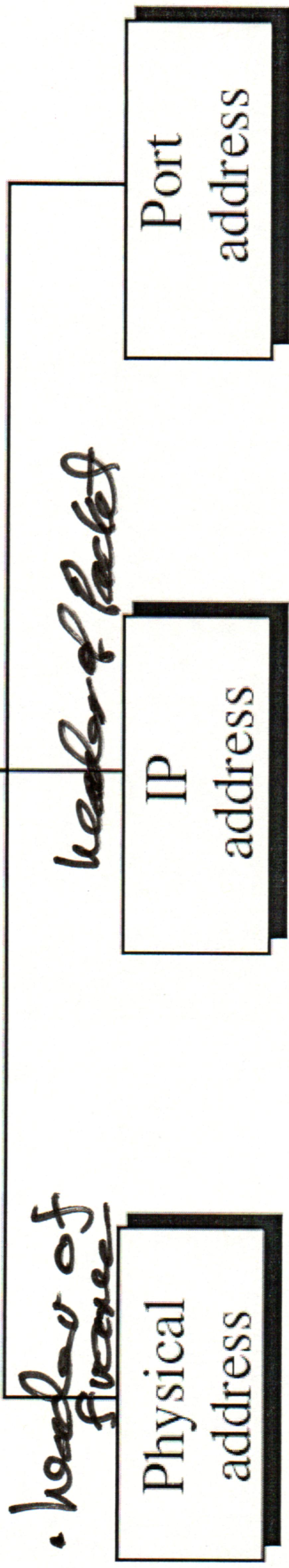


EE450, USC, Zahid

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# Addressing in TCP/IP



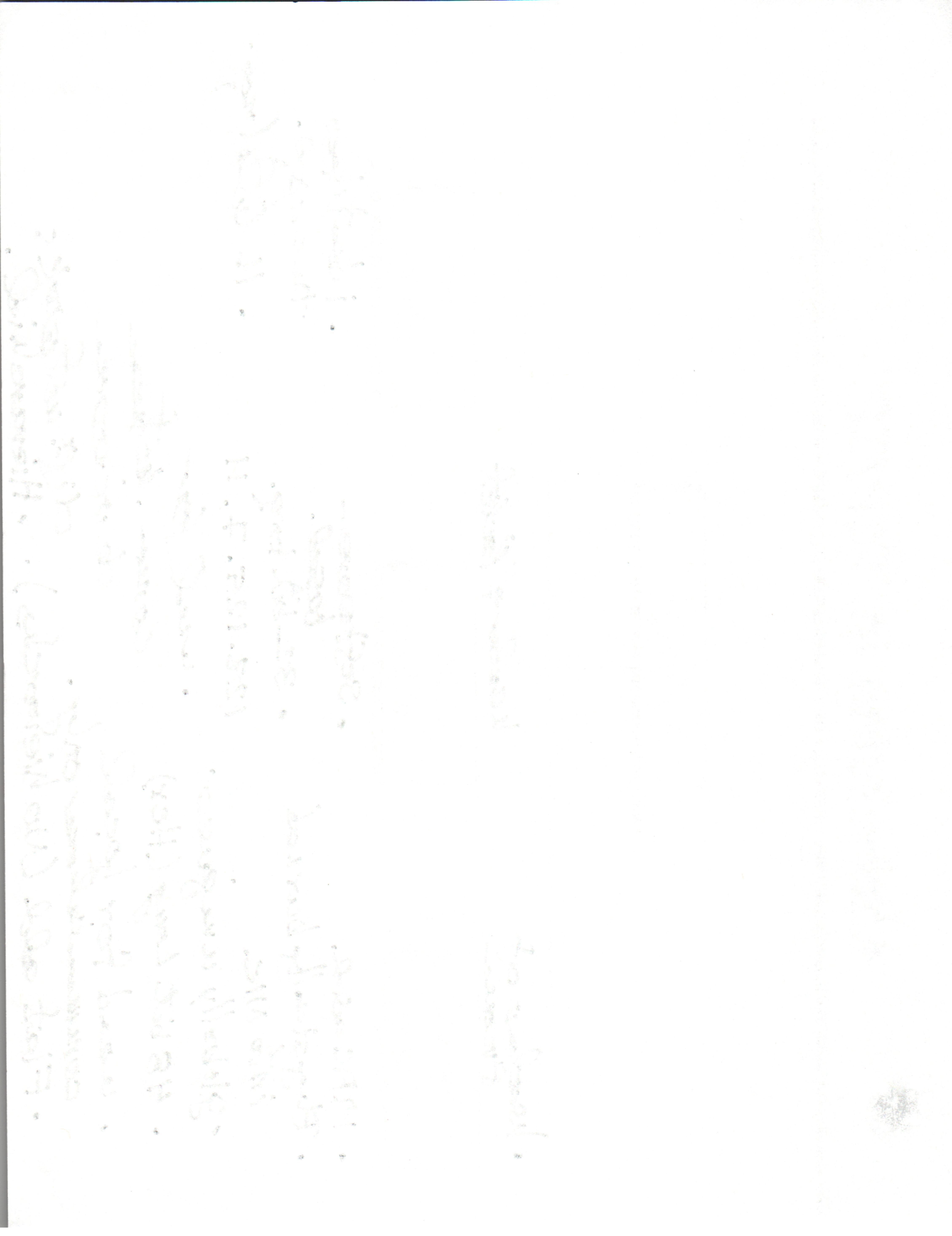
• header of message

Physical address

IP address

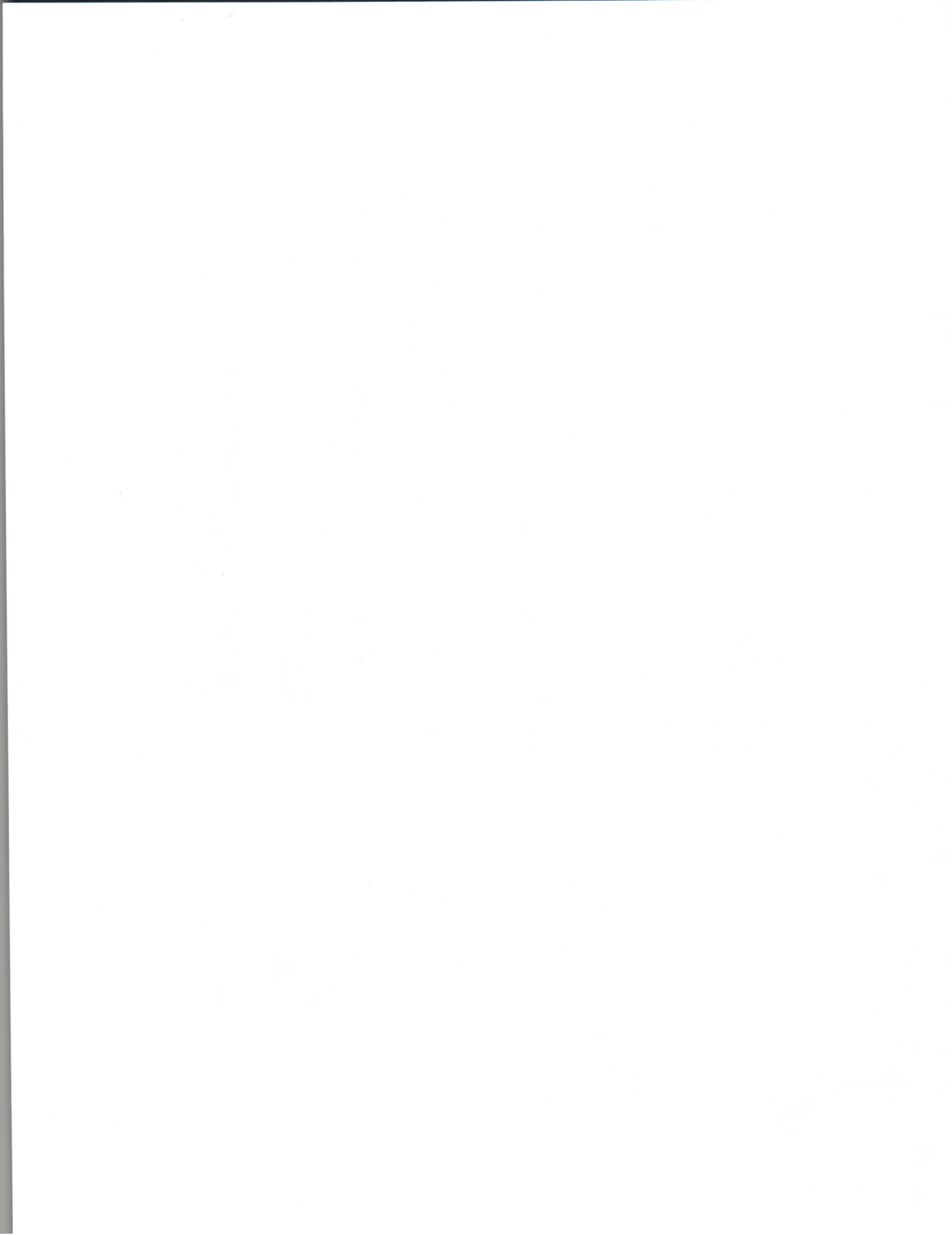
Port address

- MAC add.
- Physically bound into NIC
- globally unique
- 48 bit Long (Hex)
- used for local communication only.
- Flat add (No hierarchy).
- Hierarchical
- 32-bit long.
- Stream-based.
- 32-bit long.
- 128.125.7.11
- used for communication
- diff. networks
- indicates message.
- 16 bits long.



# Physical Ports

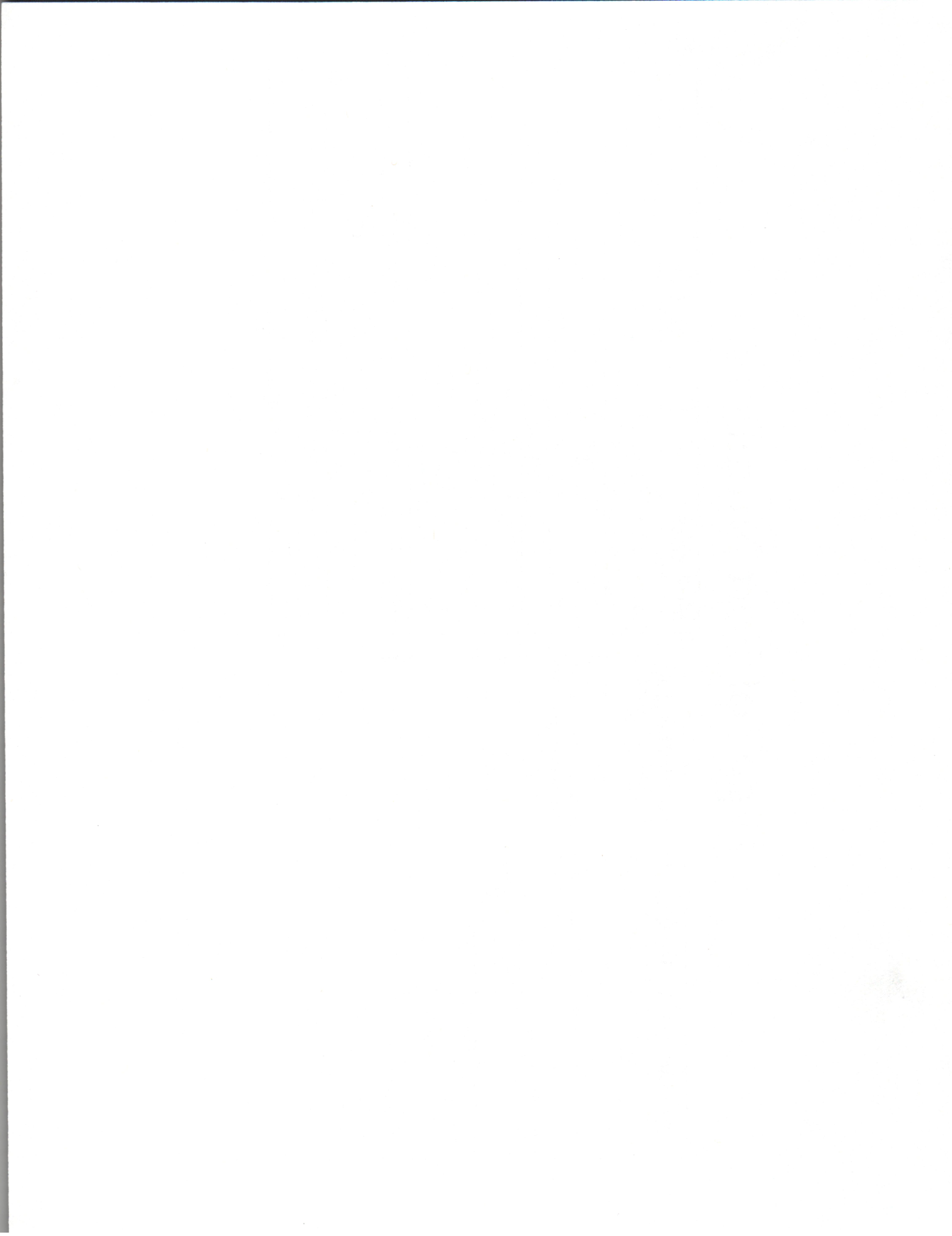




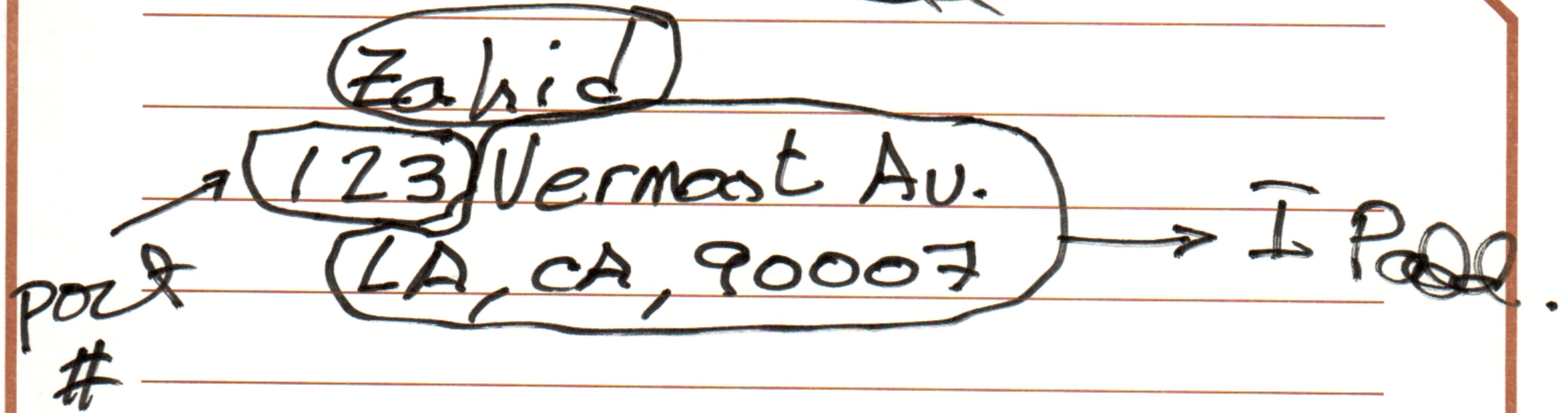
# Types of Port Numbers

Well-known Port #	Registered Port #	Dynamic/Private port #
0 - 1,023	1,024 - 49,151	49,152 - 65,535
• Allocated to server services.	<ul style="list-style-type: none"> <li>• Not assigned &amp; controlled by IANA.</li> <li>• Are reserved for use by TCP/UDP applications.</li> <li>• Each kind of TCP/UDP application has a designated port number.</li> <li>• Controlled and assigned by IANA.</li> </ul>	<ul style="list-style-type: none"> <li>• Those port numbers are open for use without approval from IANA.</li> <li>• But users must register with IANA to use TCP/UDP Applications.</li> <li>• Also known as ephemeral ports.</li> </ul>

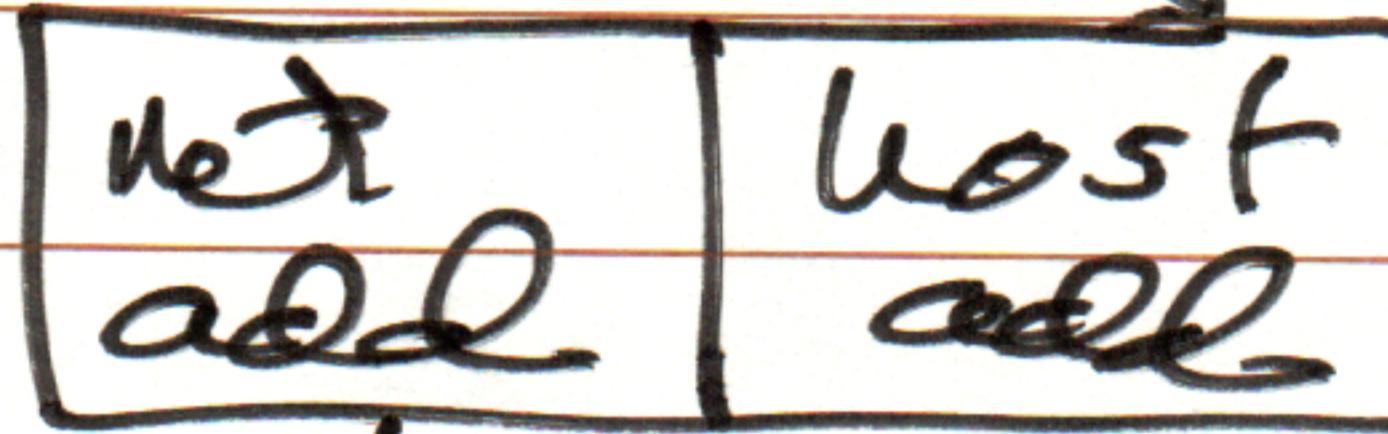
Port #	TCP/UDP	Descriptions
20	TCP	FTP - data transfer
21	TCP	FTP - data control/command
22	TCP	Secure Shell (SSH) - Secure Telnet
23	TCP	Telnet - unencrypted text communications
25	TCP	Simple Mail Transfer Protocol (SMTP) - for email routing between mail servers
53	TCP/UDP	Domain Name System (DNS)
67	TCP	Dynamic Host Configuration Protocol (DHCP) client to server
68	TCP	Dynamic Host Configuration Protocol (DHCP) Server to client
69	TCP	Trivial FTP (TFTP)
80	TCP	HTTP- Hypertext Transfer Protocol: web service, not secure
110	TCP	Post Office Protocol v3 (POP3) - management of email messages
123	UDP	NTP (Network Time Protocol), SNMP (Simple Network Time Protocol)
143	TCP	Internet Message Access Protocol v4 (IMAP4)—management of email messages
443	TCP	HTTPS- HTTP over Secure Sockets Layer: secure web service



MAC add.



32-bit



• globally unique

• ICANN

• configured  
by Admin

