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Lab Assignment - 9

Aim: Write a C program for wired network using UDP socket to perform any one of the following operations.

a. String conversion from upper case to lower case

b. Reverse the string.

c. Show packet captured traces using wireshark Packet analyzer tool.

Objectives: To understand concept of socket programming using UDP.

Theory.

i) Client Server communication

⇒ In UDP, the client doesn't form a connection with the server like in TCP and instead just sends a datagram. Similarly the server needs not accept a connection and just waits for datagrams to arrive. Datagrams upon arrival contain the address of the sender which the server uses to send data to the correct client.

ii) Introduction to UDP.

The User Datagram Protocol (UDP) is simplest Transport layer communication protocol available of the TCP/IP protocol suite. It involves minimum amount of communication mechanism. UDP is a said to be an unreliable transport protocol but it uses IP services which provides best effort delivery mechanism.

iii) The UDP segment Header:

→ UDP wraps datagrams with a UDP Header which contains four fields totaling to eight bytes. The fields in a UDP Header are:

i) Sourceport :- Port of the device sending the data.
ii) Destination port :- Port of the device recieving the data.
iii) length :- specifies the no. of bytes comprising the UDP header and the UDP payload data.
iv) Checksum :- Allows the recieving device to verify the integrity of the packet header and payload.

iv) Introduction to sockets

→ UDP Socket routines enable simple IP communication using the user datagram protocol (UDP). The UDP runs on top of the Internet Protocol (IP) and was developed for application that do not require reliability, acknowledgement, or flow control features at the transport layer.

v) UDP socket functions:

→ Uses an unconnected socket to communicate with any host. Data is sent in independent packets.

vi) UDP socket flow Description on server and client.

→ Steps of establishing a UDP socket communication on the client side are as follows:

1) Create a socket using socket() function
2) Send and recieve data by means of the recvform() and sendto() functions.

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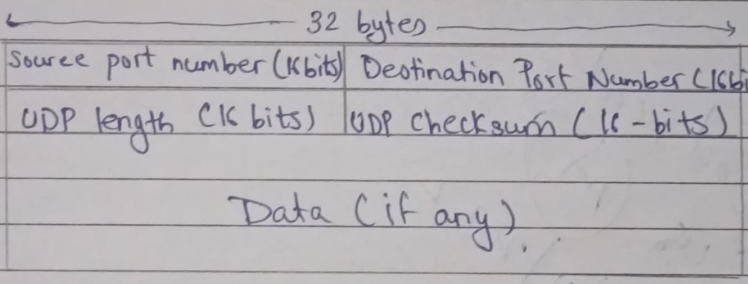
Steps of establishing a UDP socket communication on the server side ~~of~~ are as follows:

1) Create a socket with the socket() function
2) Bind the socket to an address using the bind() function
3) send and recieve data by means of recvfrom() and sendto().

FAQ's

ans 1) UDP wraps datagrams with a UDP header which contains 4 field totaling to 8 bytes.



ans 2)

Feature	TCP	UDP
Connection Status	Requires an established connection to transmit data	Connectionless protocol with no requirements for opening, maintaining, or terminating a connection.
Data Sequencing	Able to sequence	Unable to sequence.
Guaranteed delivery	Can guarantee delivery of data to destination router	Cannot guarantee delivery of data to destination.
Retransmission of Data	Retransmission of lost data packet is possible	No transmission of lost packets.
Speed	Slower than UDP	Faster than TCP

ans 3) 1) loss-less data transmission
2) Gaming, voice and video
3) services that don't need fixed packet transmission
4) Multicasting and routing update protocols
5) fast applications.

ans 4) A ephermal port is a communications endpoint (port) of the transport layer protocol of the internet protocol suite that is used for only a short period of time for the duration of a communication session.