Thapar Institute of Engineering & Technology
(Deemed to be University)
Bhadson Road, Patiala, Punjab, Pin-147004
Contact No. : +91-175-2393201
Email : info@thapar.edu

THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

Course: Computer and Communication Networks

Topic: Process-to-Process Delivery & UDP

Faculty Name

Dr. Amanpreet Kaur

Assistant Professor

Department of Electronics and Communication Engineering,

Thapar Institute of Engineering and Technology, Patiala.

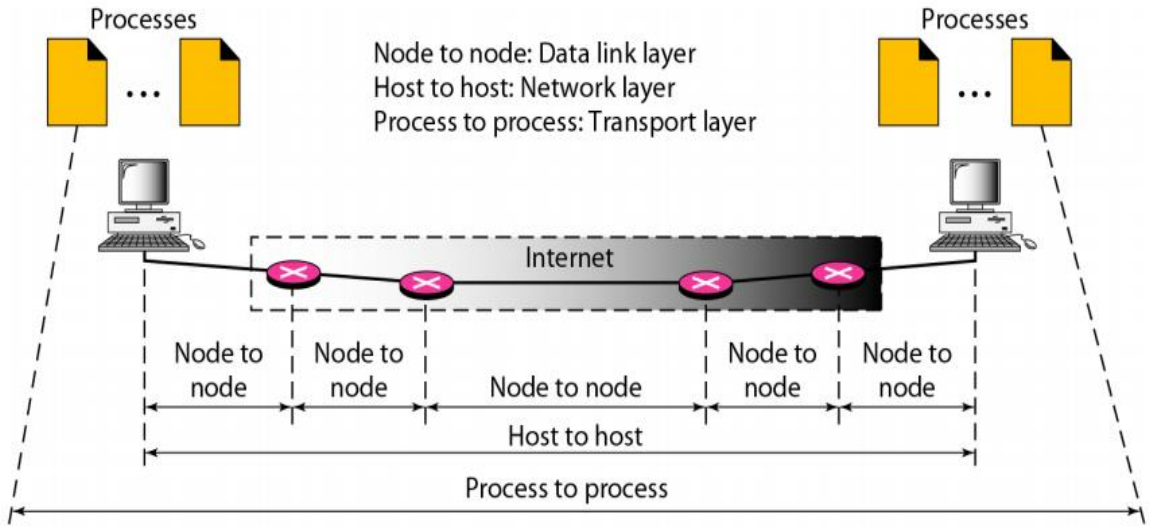
www.thapar.edu

OUTLINE

- Delivery Process
- Client/Server Paradigm
- Internet Assigned Number Authority (IANA) Ranges
- User datagram protocol (UDP)

Delivery Process

- The system must deliver data to the correct destination. In the case of video and audio, timely delivery means delivering data as they are produced, in the same order that they are produced, and without significant delay.
- **node-to-node delivery** : The data link layer is responsible for delivery of ***frames*** between two neighboring nodes over a link.
- **host-to-host delivery :** The network layer is responsible for delivery of ***datagrams*** between two hosts.
- **process-to-process delivery :** The transport layer is responsible for process-to-process delivery-the delivery of a ***packet,*** part of a message, from one process to another.



Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

Client/Server Paradigm

- In a client server architecture, computer is called a server and the resources used like printers, scanner etc. are called clients.
- To achieve process-to-process communication; the most common one is through the client/server paradigm.
- Both processes (client and server) have the same name For example, Daytime client and Daytime server
- A remote computer can run several server programs at the same time, just as local computers can run one or more client programs at the same time.
- For communication, we need Local host, Local process, Remote host and Remote process

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking, 2. slideplayer.com/4228161

Addressing

Whenever we need to deliver something to one specific destination among many, we need an address.

- **Data link layer:** MAC address to choose one node among several nodes if the connection is not point-to-point. Uses frames
- **Network layer:** IP address is use to choose one host among millions. Uses datagram
- **Transport layer:** Port number, to choose among multiple processes running on the destination host.

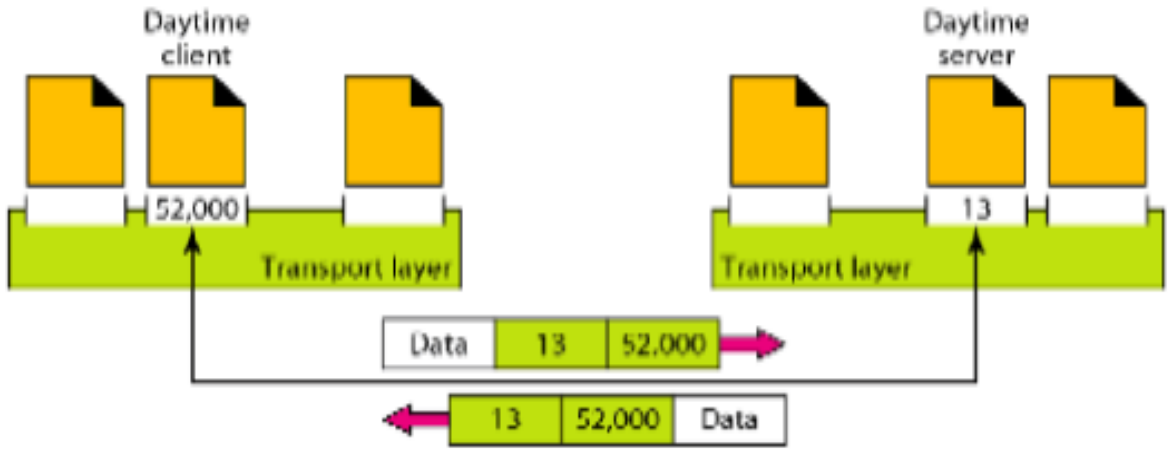
Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

- **Port Number : (0 to 65,535)**

The client program defines itself with a port number,

Port number chosen randomly by the transport layer software running on the client host. This is the ephemeral port number..

If the computer at the server site runs a server process and assigns a random number as the port number, the Every client process knows the well-known port number of the corresponding server process.



Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

IP addresses versus Port Number

- If the computer at the server site runs a server process and assigns a random number as the port number, the process at the client site that wants to access that server and use its services will not know the port number.
- Every client process knows the well-known port number of the corresponding server process.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

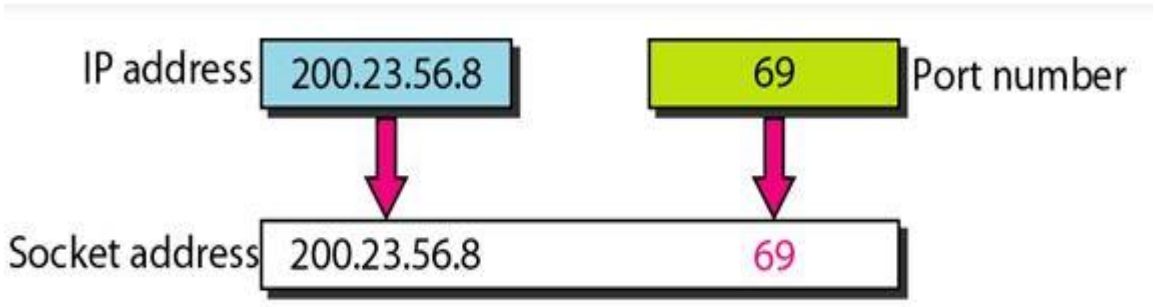
Internet Assigned Number Authority (IANA) Ranges

- Port numbers are divided into three ranges:
- Well-known ports : ranging from 0 to 1023
- Registered ports: ranging from 1024 to 49,151
- Dynamic ports: The ports ranging from 49,152 to 65,535

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

Socket Addresses:

- The combination of an IP address and a port number is called a socket address.
- Client socket address uniquely just as the server socket address defines the server process uniquely.
- Transport layer protocol needs a pair of socket addresses: the client socket address and server socket address.



Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

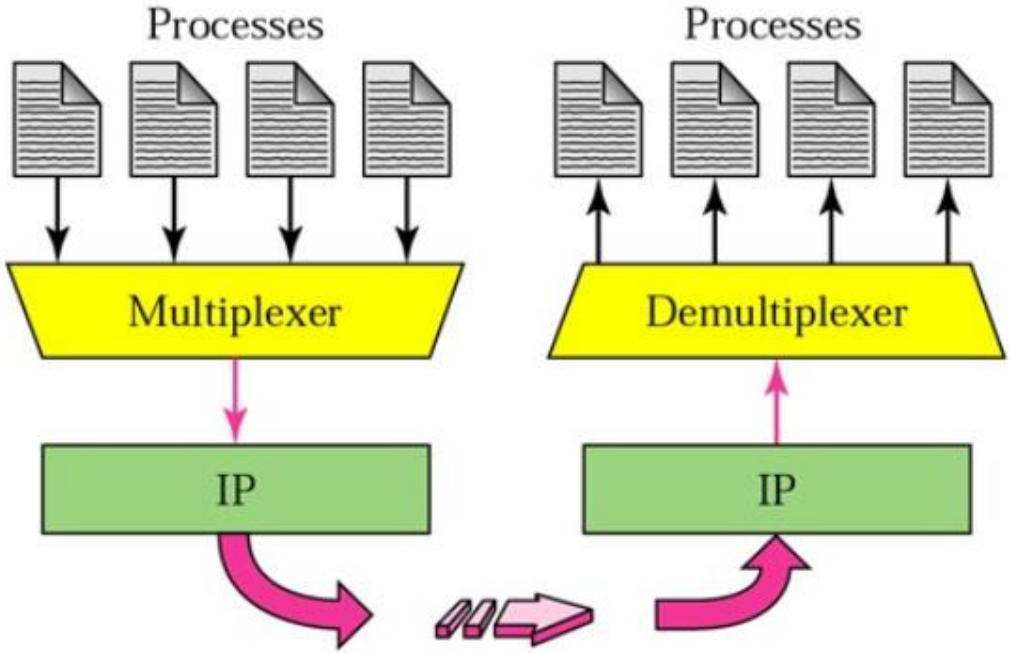
Multiplexing and Demultiplexing:

Multiplexing:

- At the sender site, there may be several processes that need to send packets. However, there is only one transport layer protocol at any time
- The protocol accepts messages from different processes, differentiated by their assigned port numbers.

Demultiplexing:

- The transport layer receives datagrams from the network layer.
- After error checking and dropping of the header, the transport layer delivers each message to the appropriate process based on the port number.



Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking

Connectionless and Connection-Oriented Service

Connectionless:

Packets are sent from one party to another with no need for connection establishment or connection release.

The packets are not numbered; they may be delayed or lost or may arrive out of sequence.

No acknowledgment

UDP

Connection-Oriented

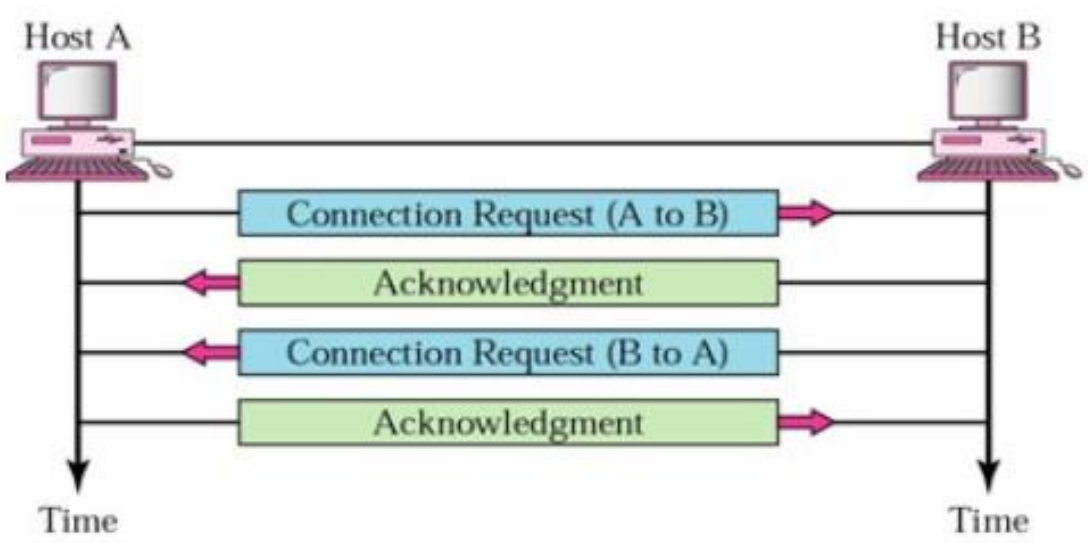
Connection is first established between the sender and the receiver.

Data are transferred.

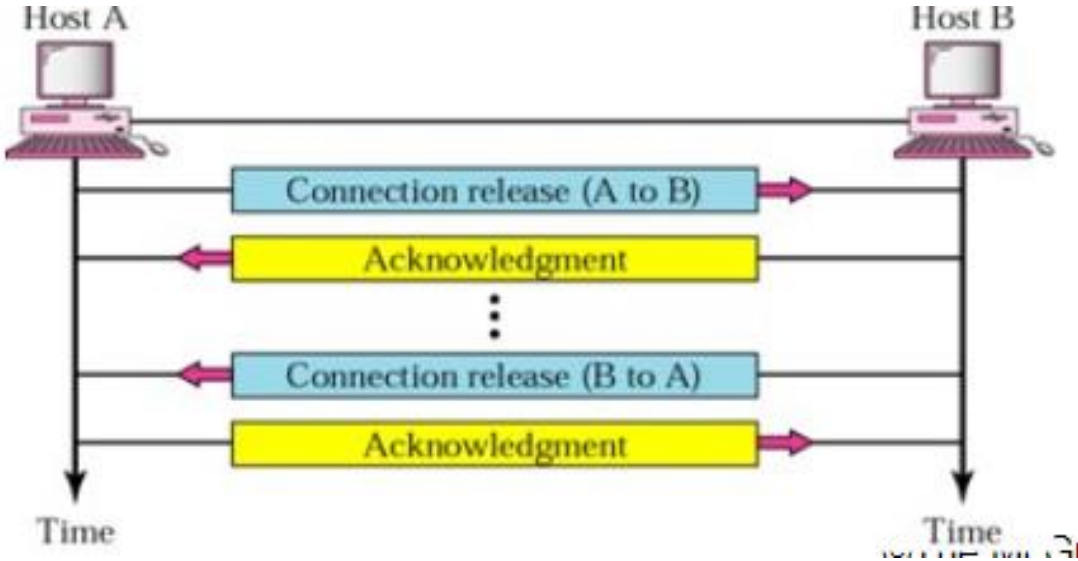
At the end, the connection is released.

The TCP and SCTP are connection-oriented protocols.

Connection Establishment



Connection Termination

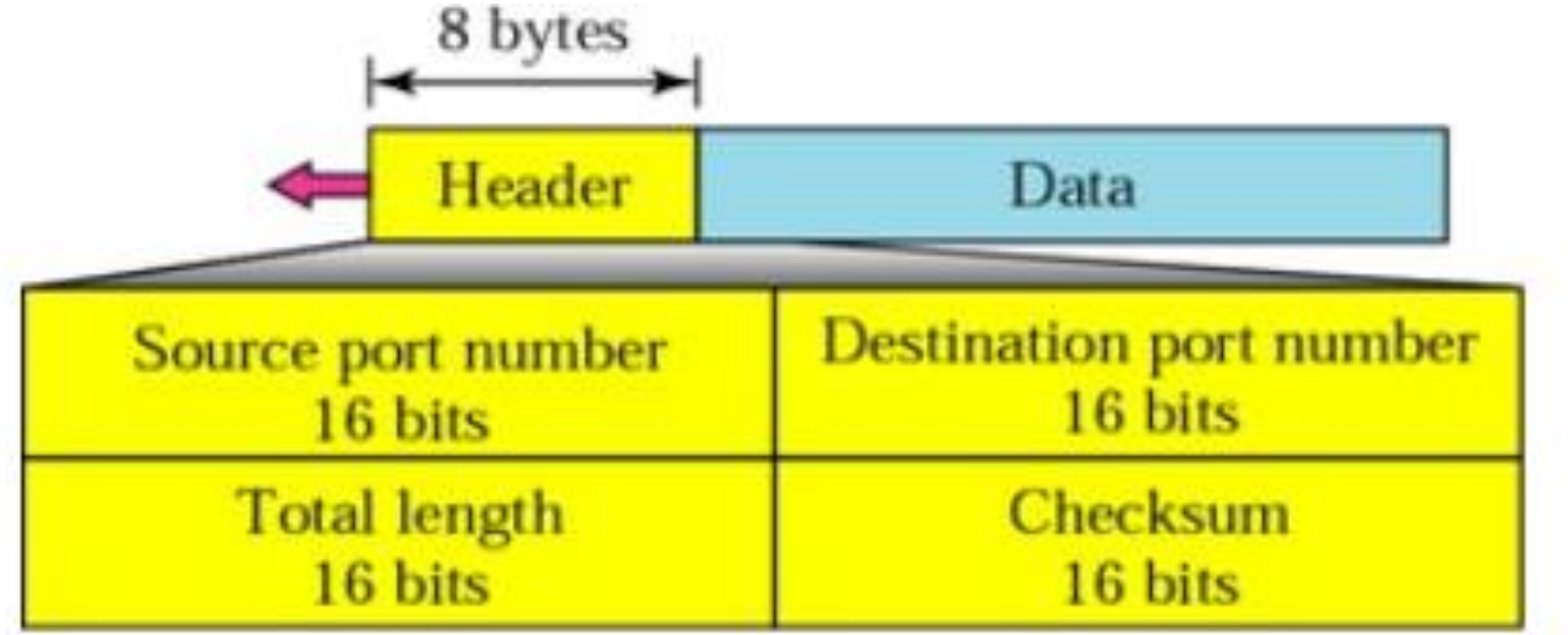


User datagram protocol (UDP)

- It is called a connectionless, unreliable transport protocol.
- It does not add anything to the services of IP except to provide process-to process communication instead of host-to-host communication.
- It performs very limited error checking.
- UDP is a very simple protocol using a minimum of overhead.
- If a process wants to send a small message and does not care much about reliability, it can use UDP.
- Sending a small message by using UDP takes much less interaction between

  the sender and receiver than using TCP or SCTP.
- It has no error and flow control

UDP datagram format



Uses of UDP

- UDP is suitable for a process that requires simple request-response communication with little concern for flow and error control.
- UDP is suitable for a process with internal flow and error control mechanisms.
- UDP is a suitable transport protocol for multicasting.
- UDP is used for management processes such as SNMP.
- UDP is used for some route updating protocols such as Routing Information Protocol (RIP)

Thank You