



SNS COLLEGE OF ENGINEERING

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Department of Information Technology

Course Name – 23ITT204 & Computer Networks

II Year / IV Semester

UNIT 2 – Transport Layer

Topic 2: Transport layer Protocols

User Datagram Protocol(UDP)



- Bluetooth technology is being used to successfully integrate many of the critical devices and systems that power hospitals.
- They provide real examples of how medical device tracking, indoor navigation, space utilization, and other location services are helping healthcare facilities optimize their operations and improve the care they provide patients.



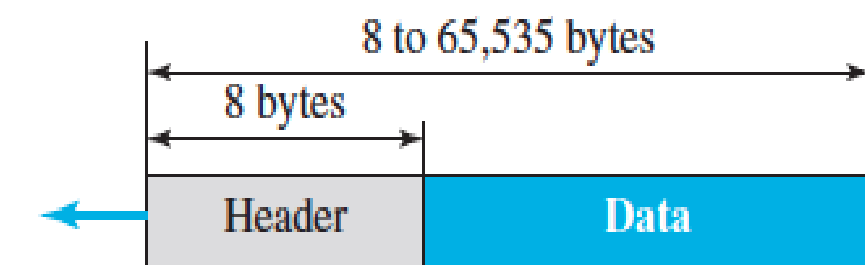
UDP

- UDP is connectionless, unreliable transport protocol.
- It does not add anything to the services of IP except for providing process-to-process communication instead of host-to-host communication.
- UDP does not implement flow control or reliable/ordered delivery.
- UDP ensures correctness of the message by the use of a checksum.
- If a process wants to send a small message and does not require reliability, UDP is used.

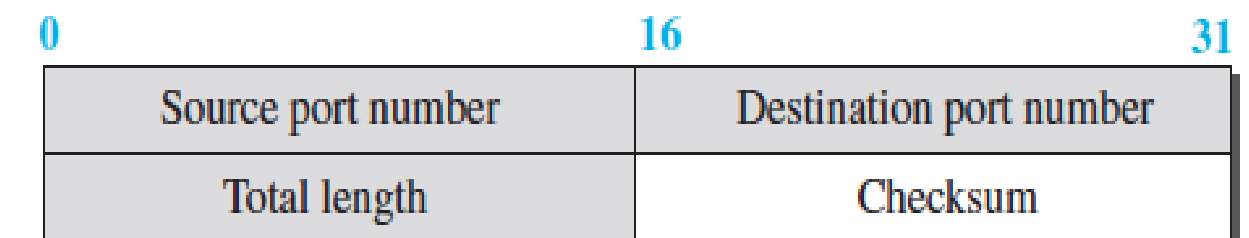
UDP

User Datagram

- UDP packets, called user datagrams, have a fixed-size header of 8 bytes made of four fields, each of 2 bytes (16 bits).
- The first two fields define the source and destination port numbers.
- The third field defines the total length of the user datagram, header plus data.
- The 16 bits can define a total length of 0 to 65,535 bytes
- The last field can carry the optional checksum



a. UDP user datagram



b. Header format



UDP - Services

Process-to-Process Communication

UDP provides process-to-process communication using socket addresses, a combination of IP addresses and port number.

Connectionless Services

- This means that each user datagram sent by UDP is an independent datagram.
- There is no relationship between the different user datagrams even if they are coming from the same source process and going to the same destination program.
- The user datagrams are not numbered.
- Only those processes sending short messages, messages less than 65,507 bytes (65,535 minus 8 bytes for the UDP header and minus 20 bytes for the IP header), can use UDP.



UDP - Services

Flow Control

UDP is a very simple protocol. There is no flow control, and hence no window mechanism. The receiver may overflow with incoming messages.

Error Control

There is no error control mechanism in UDP except for the checksum.

This means that the sender does not know if a message has been lost or duplicated.

When the receiver detects an error through the checksum, the user datagram is silently discarded.

Checksum

UDP checksum calculation includes three sections: a pseudoheader, the UDP header, and the data coming from the application layer.

Congestion Control

Since UDP is a connectionless protocol, it does not provide congestion control.

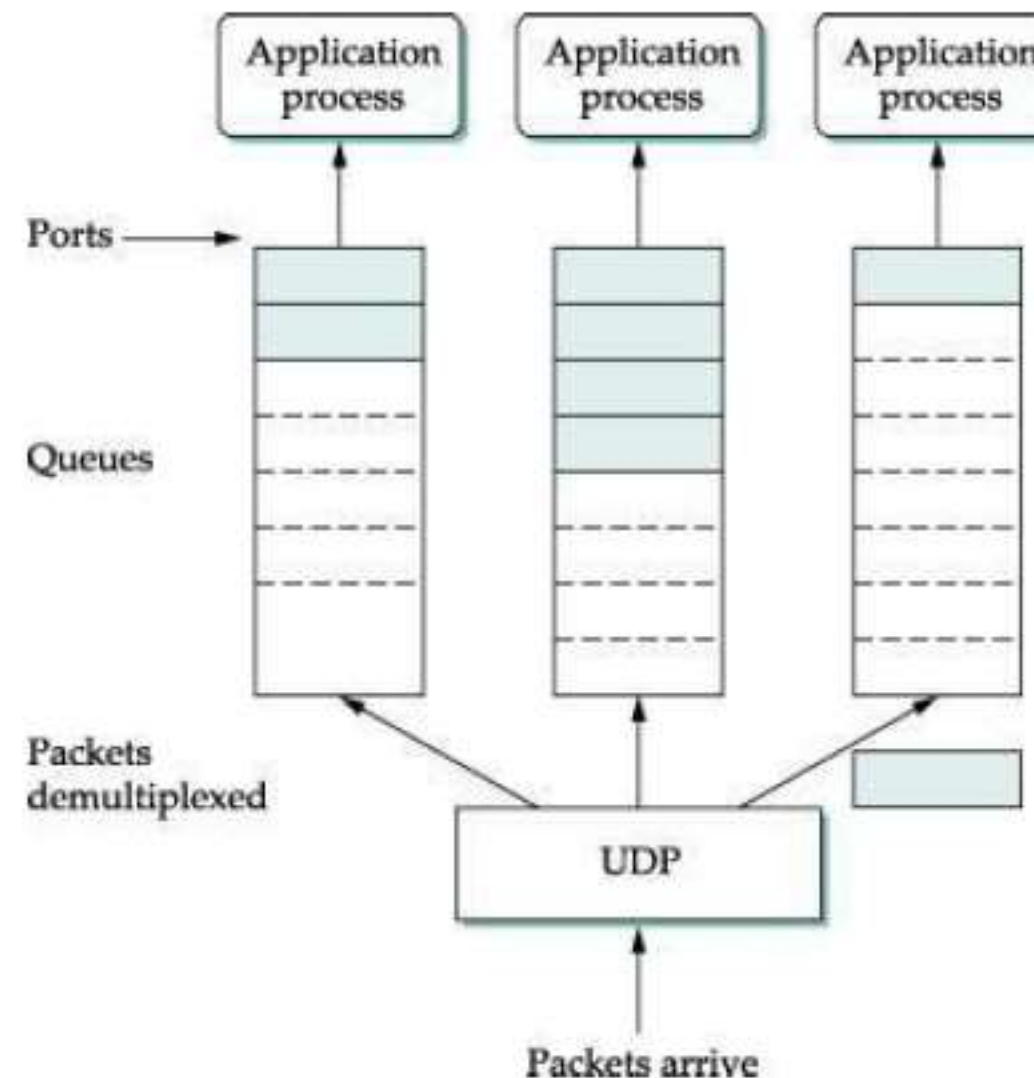
UDP - Services

Queuing

In UDP, queues are associated with ports.

Multiplexing and Demultiplexing

In a host running a TCP/IP protocol suite, there is only one UDP but possibly several processes that may want to use the services of UDP. To handle this situation, UDP multiplexes and demultiplexes





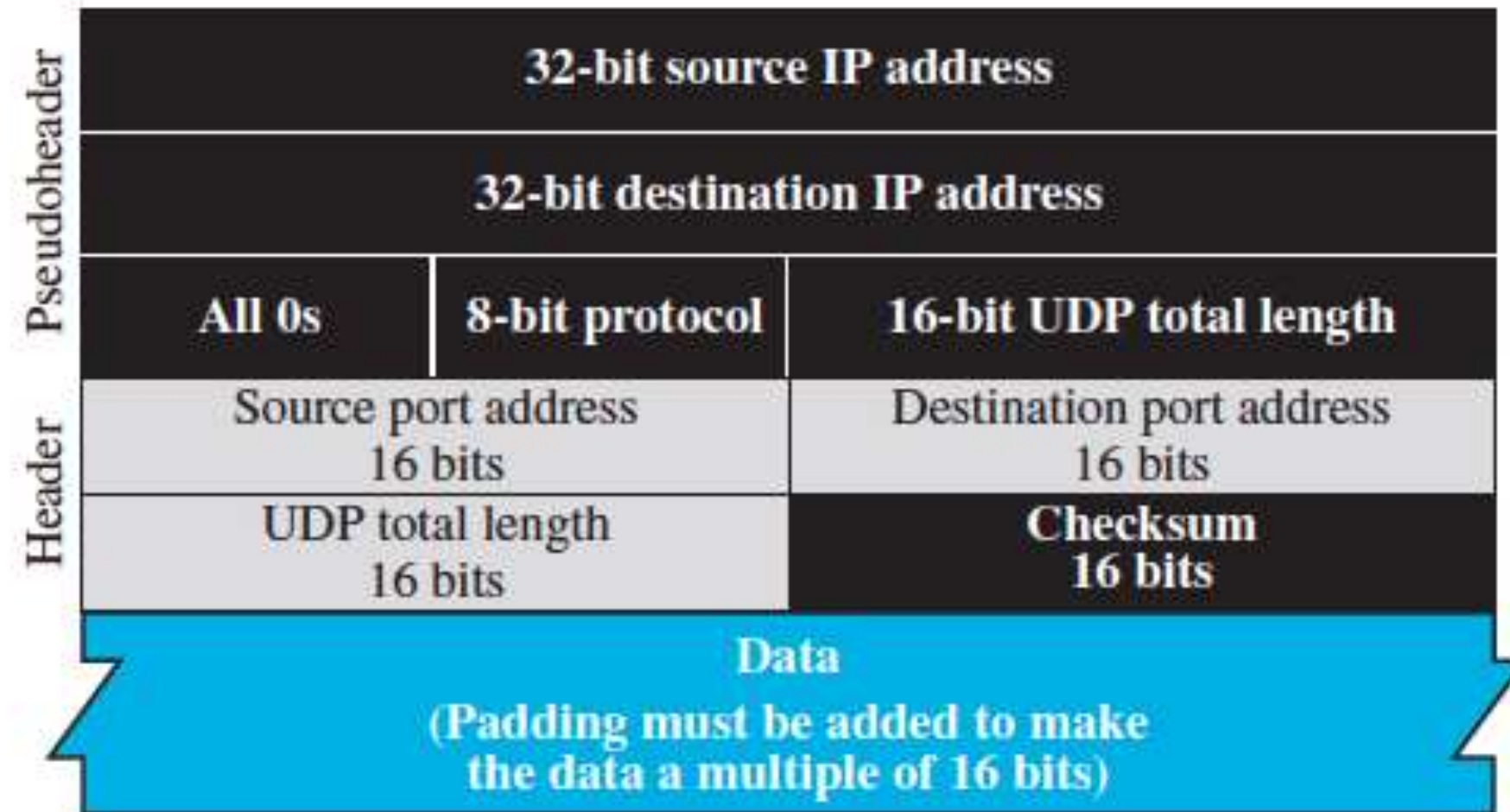
UDP - Services

Typical Applications

- UDP is suitable for a process that requires **simple request-response** communication
- 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 some route updating protocols such as Routing Information Protocol (RIP)
- UDP is normally used for interactive real-time applications

UDP - Services

Packet Format





THANK YOU