11-05-20

Computer Networks -

Revision Test

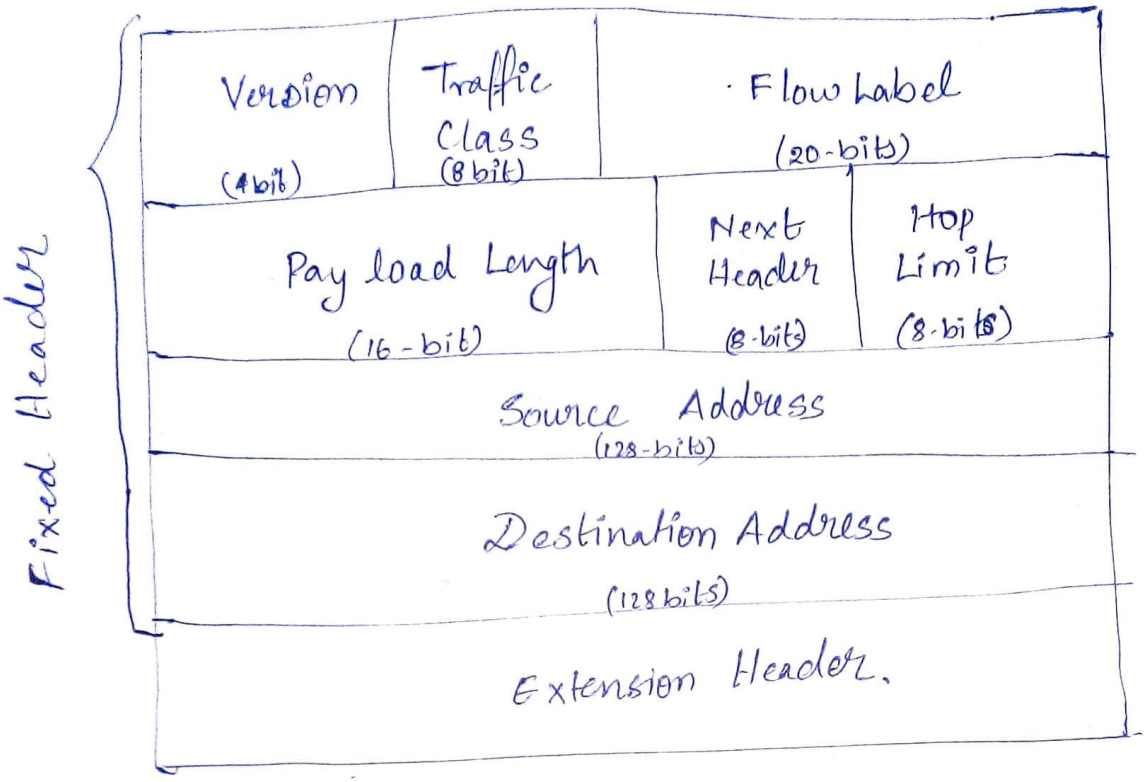
Q. 1. Draw and explain IPV6 header format

Q 2. Describe the operation and packet format of UDP.

Answers

A 1.) ~ IP version 6 is the new version of Internet Protocol, which is way better than IP version 4 in terms of complexity and efficiency.

- ~ IPv6 header is only two times larger than that of IPv4.
- ~ It has one fixed header and zero or more optional headers (extension)
- ~ All the essential information that is required by a router is stored in the Fixed (section of the) Header.
- ~ The IPv6 header looks like this:



~ **Version** (4bit) : It represents the version of Internet Protocol ie. 0110

~ **Traffic Class** (8bits) :
- 6-MSB are used for type of services - to let router know what type of services should be provided to this packet.
- 2-MSB are used for something called Explicit Congestion Notification (ECN).

~ **Flow Label** (20 bits) : This label is used to maintain the sequential order of the packets.

~ **Payload Length** (16 bits) : Pay load ranges from extention header to the upper layer of the data. It's length is stored in this field.

A2.) UDP

- UDP - stands for User datagram protocol.
- It is a fast protocol that was developed to be used by applications that do not require reliability, acknowledgment or flow control measures / features of the transport layer.
- It uses a simple connectionless communication model with minimum of protocol mechanisms.
- UDP is sometimes called a wrapper protocol, since all it does is wrap application data in its simple message format and send it IP.
- The operation of UDP can be broken down into 3 simple steps:

1. Higher-layer data transfer: An application sends a message to the UDP software.
2. UDP Message Encapsulation: The higher-layer message is encapsulated into the field of UDP message.
   - The header of UDP is filled in, including the Source Port and Destination Port. The check sum is

Next Header (8-bits) :- This field is used to indicate whether the extension header is present or not. (If Extension Header is not present then the trailing section will be the data)

Hop-Limit (8 bits) :- It is same functionality as TTL in IPv4 where after a certain number of hops if the packet has not reached the destination it is discarded.

Source Address (128 bits) :- This field contain the network address of the original sender.

Destination Address (128 bits) :- This field consists of the network address of the final destination.

Extension Header :- This is an additional (and optional) header which contain extra information which may be required by the routers in the network.

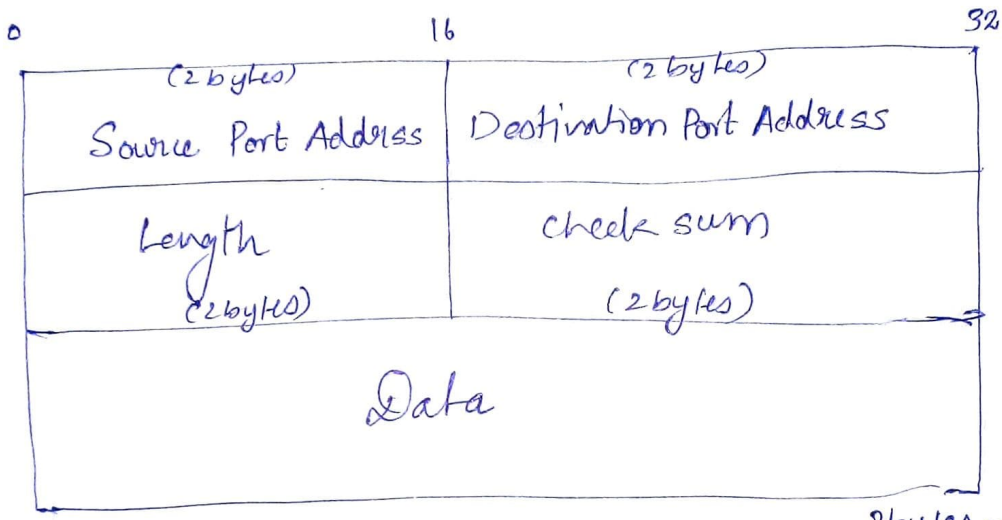
is also included in it.

5. Finally it is passed to the IP for transmission.

~~Transport~~

~ In the destination the reverse operation takes place.

~ The message / packet format of UDP is shown below:



2 bytes = 16 bits.

Soure / Destination Port Address (2 bytes each) : It is the inial and final address for packet transmission.

Length (2 bytes) : The length of entire UDP datagram including both header & data fields

Check sum (2 bytes) : A 16 bit check sum is computed for verifying the correctness of the packet.

Data (variable) : The messeage is put in this field tobe transmitted.