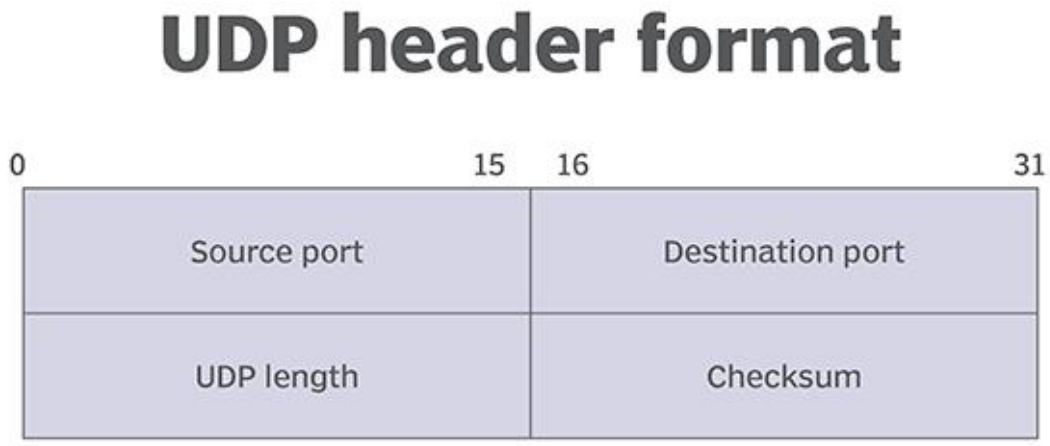
6th Assignment
WRC078BEI047

Q: What is the size of UDP header? What are the different fields? Describe its field.

Ans: The size of the UDP (User Datagram Protocol) header is 8 bytes. The header consists of the following fields:

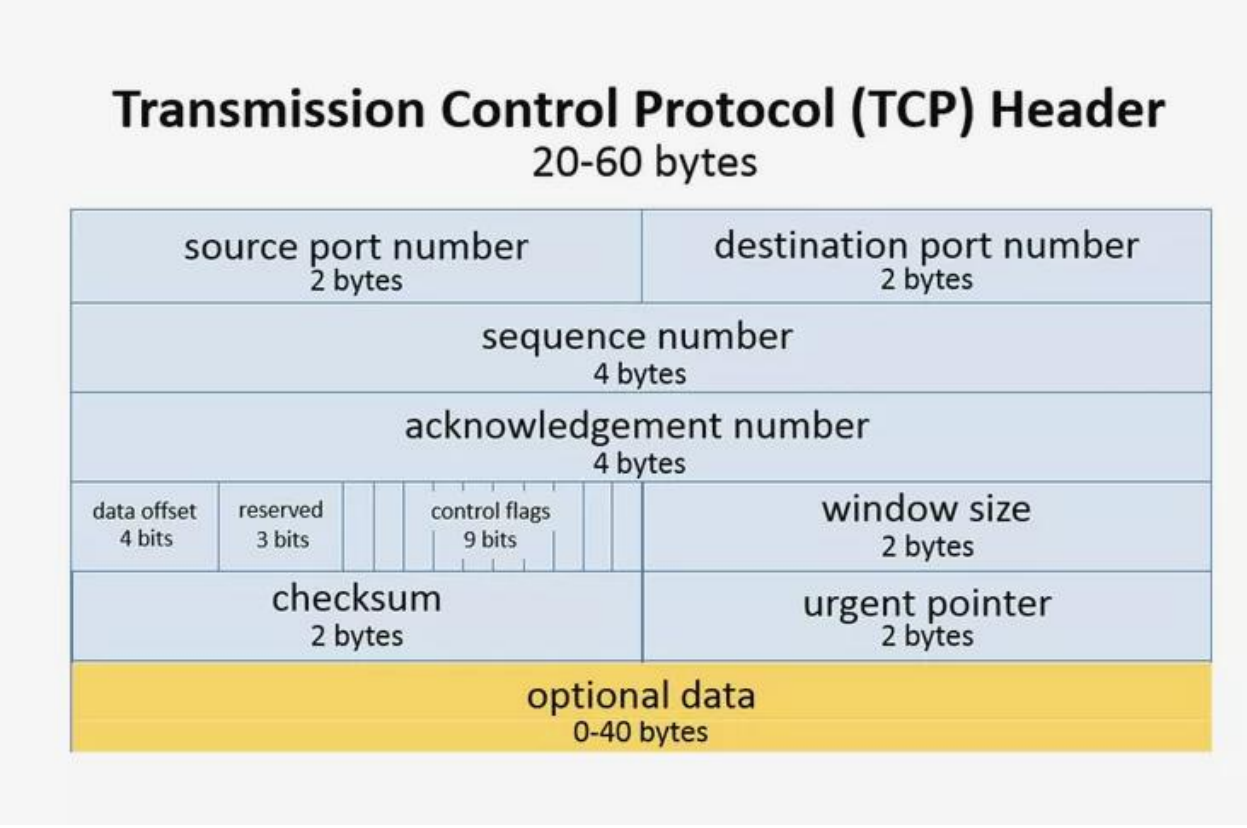
1. **Source Port (2 bytes)**: This field specifies the port number of the sender. It is used to identify the application sending the data. It is an optional field; if not used, it is set to 0.
2. **Destination Port (2 bytes)**: This field specifies the port number of the receiver. It is used to identify the application on the receiving end.
3. **Length (2 bytes)**: This field specifies the total length of the UDP packet, including both the header and the data. The minimum value for this field is 8 bytes (the size of the header).
4. **Checksum (2 bytes)**: This field is used for error-checking of the header and data. It helps ensure the integrity of the data being transmitted. If no checksum is calculated, it is set to 0.



Q: What is the size of TCP header? What are the different fields? Describe its field.

Ans: The size of a TCP header varies depending on the options included but is at least 20 bytes. Here are the fields in a basic TCP header, each with a brief description:

1. **Source Port (16 bits)**: Identifies the sending port.
2. **Destination Port (16 bits)**: Identifies the receiving port.
3. **Sequence Number (32 bits)**: Used to ensure data is received in order.
4. **Acknowledgment Number (32 bits)**: Indicates the next expected byte from the sender.
5. **Data Offset (4 bits)**: Indicates the size of the TCP header in 32-bit words.
6. **Reserved (3 bits)**: Reserved for future use and should be set to zero.
7. **Flags (9 bits)**: Control flags used for managing the state of the connection:
8. **Window Size (16 bits)**: Specifies the size of the sender's receive window.
9. **Checksum (16 bits)**: Used for error-checking of the header and data.
10. **Urgent Pointer (16 bits)**: If the URG flag is set, this 16-bit field is an offset from the sequence number indicating the last urgent data byte.
11. **Options (variable)**: May vary in length and include options for maximum segment size, window scaling, and timestamps, among others.
12. **Padding (variable)**: Added to ensure the header is a multiple of 32 bits.The total header length can vary from 20 bytes (without options) to 60 bytes (with maximum options).



TCP

- Guarantees that data arrives as sent.
- Error-checks streams of data.
- A 20-byte header permits an optional 40 bytes of function data.
- Slower than UDP.
- Best for apps that require reliability.

UDP

- No guarantee that data arrives.
- No error-checking provided.
- An 8-byte header allows only compulsory function data.
- Faster than TCP.
- Best for apps that require speed.