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 said to be an unreliable transport protocol but it uses IP services which provides best effort delivery mechanism.

In **UDP**, the receiver does not generate an acknowledgement of packet received and in turn, the sender does not wait for any acknowledgement of packet sent. This shortcoming makes this protocol unreliable as well as easier on processing.

### Requirement of UDP

A question may arise, why do we need an unreliable protocol to transport the data? We deploy **UDP** where the acknowledgement packets share significant amount of bandwidth along with the actual data. For example, in case of video streaming, thousands of packets are forwarded towards its users. Acknowledging all the packets is troublesome and may contain huge amount of bandwidth wastage. The best delivery mechanism of underlying IP protocol ensures best efforts to deliver its packets, but even if some packets in video streaming get lost, the impact is not calamitous and can be ignored easily. Loss of few packets in video and voice traffic sometimes goes unnoticed.

### Features

- **UDP** is used when acknowledgement of data does not hold any significance.
- **UDP** is good protocol for data flowing in one direction.
- **UDP** is simple and suitable for query based communications.
- **UDP** is not connection oriented.
- **UDP** does not provide congestion control mechanism.
- **UDP** does not guarantee ordered delivery of data.
- **UDP** is stateless.
- **UDP** is suitable protocol for streaming applications such as VoIP, multimedia streaming.

### UDP Header

**UDP** header is as simple as its function.

```
0 15 16 31
<table>
<thead>
<tr>
<th>Source Port</th>
<th>Length</th>
<th>Destination Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Checksum</td>
<td></td>
</tr>
</tbody>
</table>
```

**UDP** header contains four main parameters:

- **Source Port** - This 16 bits information is used to identify the source port of the packet.
- **Destination Port** - This 16 bits information, is used identify application level service on destination machine.
- **Length** - Length field specifies the entire length of **UDP** packet including header. It is 16-bits field and minimum value is 8-byte, i.e. the size of **UDP** header itself.
- **Checksum** - This field stores the checksum value generated by the sender before sending. IPv4 has this field as optional so when checksum field does not contain any value it is made 0.
and all its bits are set to zero.

**UDP application**

Here are few applications where UDP is used to transmit data:

- Domain Name Services
- Simple Network Management Protocol
- Trivial File Transfer Protocol
- Routing Information Protocol
- Kerberos