UDP Header Overview

Aayush Adhikari
Roshan Tiwari
Shishir Sharma Rijal
Sudip Acharya

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Introduction

In computer networking, the User Datagram Protocol (UDP) is one of the core communication protocols of the Internet protocol suite used to send messages (transported as datagrams in packets) to other hosts on an Internet Protocol (IP) network. Within an IP network, UDP does not require prior communication to set up communication channels or data paths.

UDP is suitable for purposes where error checking and correction are either not necessary or are performed in the application

UDP Header Fields

The UDP header is 8 bytes (64 bits) long and consists of four fields:

- **Source Port (16 bits)**: It pecifies the port number of the sender's application. If not used, it should be zero.
- **Destination Port (16 bits)**: It specifies the port number of the recipient's application.
- **Length (16 bits)**: This field specifies the total length of the UDP header and UDP data, in bytes. The minimum length is 8 bytes, which is the length of the header. However, the actual limit for the data length, which is imposed by the underlying IPv4 protocol, is 65,507 bytes.
- **Checksum (16 bits)**: This field is used for error detection in the header and data. It is optional in IPv4, but mandatory in IPv6. If not used, the field is set to zeros.
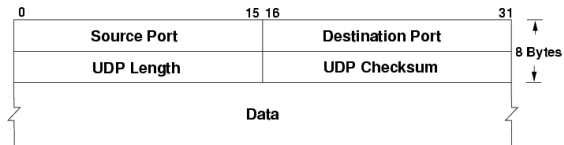
UDP Header Structure

Figure: UDP Header Structure

Setting Field Values

- **Source Port**: It is assigned dynamically by the operating system from a range of ephemeral ports, or specified by the application.
- **Destination Port**: It is determined by the application protocol being used (e.g., 53 for DNS, 67/68 for DHCP).
- **Length**: This value is calculated as the sum of the length of the UDP header (8 bytes) and the length of the encapsulated data.
- **Checksum**: It's value is calculated using a pseudo-header, the UDP header, and the data. The pseudo-header includes:
  - Source IP address
  - Destination IP address
  - Protocol (set to 17 for UDP)
  - UDP length