UDP: Datagram Transport Service

Chapter 24

Need for End-To-End Transport Service

• IP lacks an essential feature: It cannot distinguish among multiple applications running on one computer at the same time.
• What if a user runs a browser and ftp at the same time. Both these applications are associated with the same IP number (of NIC of the host).
• A protocol that DOES allow an individual application program to serve as the end-point of communication is called an end-to-end protocol.

User Datagram Protocol (UDP)

• End-to-end
• Connectionless
• Message-oriented
• Best-effort
• Arbitrary interaction(s) with multiple applications
• Operating system independent

UDP

• UDP provides an end-to-end service that allows an application program to send and receive individual messages, each of which travels in a separate datagram. An application can choose to restrict communication to one other application or communicate with multiple applications.

Arbitrary Interaction

• UDP allows four styles of interaction
  – One-to-one
  – One-to-many
  – Many-to-one
  – Many-to-many
• UDP allows an application to transmit the message via IP multicast or broadcast.

Port Numbers

• UDP uses port numbers to identify applications.
• Each computer that uses UDP must provide a mapping between port numbers and the program identifiers used by the operating system.
UDP Segment Format

<table>
<thead>
<tr>
<th>0</th>
<th>15</th>
<th>16</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOURCE PORT</td>
<td>DESTINATION PORT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LENGTH</td>
<td>UDP CHECKSUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATA</td>
<td></td>
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</tbody>
</table>

UDP Encapsulation

[Diagram of UDP encapsulation with IP Header and Data Area, Frame Header and Data]