IPv4 Header vs IPv6 Header

Rob Blokzijl
RIPE Chair
IPv4 Header

<table>
<thead>
<tr>
<th>Version</th>
<th>Hd. Len.</th>
<th>TOS</th>
<th>Total Packet Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Identification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flags</td>
<td>Fragment Offset</td>
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<tr>
<td></td>
<td></td>
<td>TTL</td>
<td>Protocol</td>
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<td></td>
<td></td>
<td></td>
<td>Header Checksum</td>
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<td></td>
<td></td>
<td></td>
<td>Source IP Address</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Destination IP Address</td>
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<tr>
<td></td>
<td></td>
<td>Options</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Padding</td>
</tr>
</tbody>
</table>

20 bytes

n bytes

32 bits
IPv6 Header

<table>
<thead>
<tr>
<th>Version</th>
<th>Traffic Class</th>
<th>Flow Label</th>
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<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Payload Length</td>
<td>Next Header</td>
<td>Hop Limit</td>
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</table>

- Source IP Address
- Destination IP Address

40 bytes

32 bits
IPv6 Header Fields

- **Version**: IP version 6
- **Traffic Class**: used in congestion control
- **Flow Label**: QoS management
- **Payload length**: payload length in bytes
- **Next header**: specifies the next encapsulated protocol
- **Hop Limit**: replaces the ttl field of IPv4
- **Source and Destination addresses**: 128 bits each
What is not in the header

- Security
- Quality of Service
- Autoconfiguration
- Better Internet Routing
Header Format Simplification

• Fixed length of header
  – Length field eliminated by no options

• No fragmentation on router
  – Fragmentation field and option field moved to extension header
  – Hosts should use the path MTU discovery

• No header checksum
  – Reduce cost of header processing, no checksum updates at each router

Improvement of routing speed