AX.25 over Internet Protocol
draft-learmonth-intarea-rfc1226-bis

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IETF108 Online // 27th July 2020
HamBSD
Amateur radio, also known as ham radio, is the use of radio frequency spectrum for purposes of non-commercial exchange of messages, wireless experimentation, self-training, private recreation, radiosport, contesting, and emergency communication.

—Wikipedia. "Amateur Radio".
Packet radio is a digital radio communications mode used to send packets of data.

—Wikipedia. "Packet Radio".
The AX.25 (Amateur X.25) [1] protocol was derived from the X.25 data link layer protocol and adapted for amateur radio use. Every AX.25 packet includes the sender’s amateur radio callsign, which satisfies the US FCC requirements for amateur radio station identification. AX.25 allows other stations to automatically repeat packets to extend the range of transmissions.

—Wikipedia. "Packet Radio".
• Bell 202 Tones over FM (AFSK)
• Bell 103 Tones over SSB (FSK)
• PSK, MFSK
• Virtual (overlay)
• AX.25 Layer 3 (BBS, Mailbox, Keyboard-to-keyboard)
• IPv4 over AX.25
• Delay Tolerant Networking
• Automatic Packet Reporting System (APRS) [6]
Internet Protocol Encapsulation of AX.25 Frames

Status of this Memo

This memo describes a method for the encapsulation of AX.25 (the Amateur Packet-Radio Link-Layer Protocol) frames within IP packets. This technique is an Experimental Protocol for the Internet community. Discussion and suggestions for improvement are requested. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.
This update adds recommendations for DiffServ Codepoint [5] values for the encapsulating IP headers for both AX.25 and APRS frames.

**AX.25:**

<table>
<thead>
<tr>
<th>Frame Type</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>BE</td>
</tr>
<tr>
<td>Priority</td>
<td>AF21</td>
</tr>
</tbody>
</table>

**APRS:**

<table>
<thead>
<tr>
<th>Frame Type</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>AF11</td>
</tr>
<tr>
<td>Low Precedence</td>
<td>BE</td>
</tr>
<tr>
<td>Operator Present</td>
<td>AF21</td>
</tr>
</tbody>
</table>
• Integrity check is included in original protocol
• There’s a need for authenticity guarantee
• Encryption is forbidden on the amateur radio service
• tl;dr use IPSec with ESP [4] and NULL encryption [2]
AX.25 over IP
Questions, Comments, Feedback and Answers

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https://datatracker.ietf.org/doc/draft-learmonth-intarea-rfc1226-bis/


B. Kantor. Internet protocol encapsulation of AX.25 frames. RFC 1226 (Experimental), May 1991.


Spare Slides
Assorted things that do AX.25

- http://www.linux-ax25.org/wiki/Main_Page
- https://www.kenwood.com/au/com/amateur/tm-d710a/
- https://www.ariss.org/
  current-status-of-iss-stations.html
- https://hambsd.org/
- https://github.com/ke6jjj/ka9q-unix
- https://scm.xan.host/patty.git/
- https://github.com/wb2osz/direwolf