Using NTP Extension Fields without Authentication

draft-mizrahi-ntp-extension-field-00

Tal Mizrahi
Marvell

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The NTP header includes:
- Fixed fields.
- Optional fields.

Optional fields (NTPv4):
- Message Authentication Code (MAC)
  - 24 octets
  - 20 octets
  - 4 octets (crypto NAK)
- Extension fields
Extension Field Format (NTPv4)

<table>
<thead>
<tr>
<th>Field Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td></td>
</tr>
<tr>
<td>Padding (as needed)</td>
<td></td>
</tr>
</tbody>
</table>
The problem:
- RFC 5905, 5906 imply that extension fields are generic tools for future features, independent of authentication.
- RFC 5905, 5906 imply that extension fields can only be used when a MAC is present.

Goal:
- Clarify the ambiguity.
RFC 5906 (Autokey) – Extension Field Parsing

1. Parse Fixed Fields in NTP Header
2. # of remaining octets = 0
   - Yes: End parsing
   - No: Assume it’s an Extension Field, parse accordingly
3. # of remaining octets ≤ 24
   - Yes: Assume it’s a MAC
   - No: # of remaining octets = 0
4. Yes: End parsing
5. No: Parse Fixed Fields in NTP Header
RFC 5906 (Autokey) – Extension Field Parsing

- Parse Fixed Fields in NTP Header
  - # of remaining octets = 0
    - End parsing
  - No
    - # of remaining octets ≤ 24
      - Yes
        - Assume it’s a MAC
      - No
        - Assume it’s an Extension Field parse accordingly

If the last extension field ≥ 28 octets, we never get here.
The last extension field MUST be at least 28 octets long.

Other extension fields (if any): at least 16 octets long (NTPv4).

Compatible with existing implementations complying to RFC 5905, RFC 5906.
Next Steps

- Feedback from WG.
- Adopt as WG document.
- Consider extending the document to define a more general and flexible usage of extension fields.
- Issue an erratum for RFC 5905, rephrasing:
  "In NTPv4, one or more extension fields can be inserted after the header and before the MAC, which is always present when an extension field is present."