

Network Time Protocol Extended Information Extension Field
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Abstract

The network packet format used by NTP has changed very little between NTPv1, defined by [RFC 958](#) [[RFC0958](#)] in 1985, and NTPv4, defined by [RFC 5905](#) [[RFC5905](#)]. The core network packet used by NTP has no spare bits available for reporting additional state information and no larger data areas available for larger amounts of information. This proposal offers a new extension field that would contains this additional information.

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1. Introduction

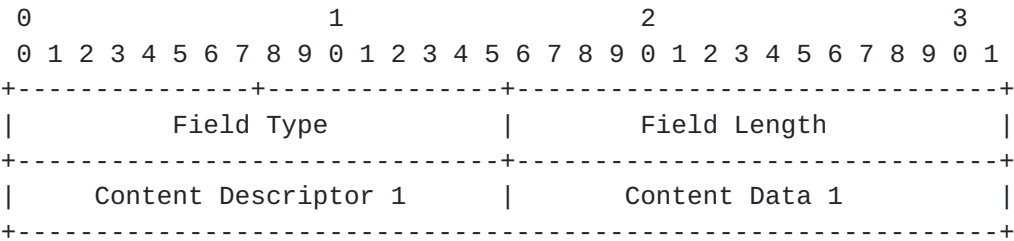
The core NTP packet format has changed little since [RFC 958](#) [[RFC0958](#)] was published in 1985. Since then, there has been demonstrated need to convey additional information about NTP's state in an NTP packet, but no backward-compatible way to usurp the few otherwise potentially available bits has been found, and no larger data areas are available in the core packet structure. This proposal offers a new extension field that would contain this additional information.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

2. The Extended Information Extension Field

The Field Type of the Extended Information EF includes a version specification, to make it easier to evolve this specification.



NTP Extension Field: Extended Information

Field Type: TBD (Recommendation for IANA: 0x0009 (Extended-Information, MAC required), 0x2009 (Extended-Information, MAC

OPTIONAL), 0x0109 (Extended-Information Version 1, MAC required),
0x2109 (Extended-Information Version 1, MAC OPTIONAL)

Field Length: as needed

Payload: For Version 1, a two octet Content Descriptor field and a two octet Content Data field, as described below.

Version 1 Content fields.

Content Descriptor 1	Content Data 1
0x0001	TAI offset in the low-order 8 bits, 24-31
0x0002	Interleave Mode indicator in Bit 23
0xFFFD	Reserved (Zeroes)

Interleave Mode: 1 if the sender is in interleave mode, 0 otherwise

NTP Extension Field: Extended Information Version 1 Content Fields

Example: A system that wants to convey an offset to TAI of 36 seconds, and show it is in interleave mode.

0	1	2	3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1			
-----+-----+-----+-----			
Field Type (0x2109)	Field Length (0x0008)		
-----+-----+-----+-----			
0x0003	0x0124		
-----+-----+-----+-----			

NTP Extension Field: Extended Information V1, Example

3. Acknowledgements

The author wishes to acknowledge the contributions of Martin Burnicki.

4. IANA Considerations

This memo requests IANA to allocate NTP Extension Field Types

0x0009 (Extended-Information, MAC Required)

0x2009 (Extended-Information, MAC OPTIONAL)

0x0109 (Extended-Information Version 1, MAC Required)

0x2109 (Extended-Information Version 1, MAC OPTIONAL)

for this proposal.

5. Security Considerations

Additional information TBD

6. Normative References

- [RFC0958] Mills, D., "Network Time Protocol (NTP)", [RFC 958](#), DOI 10.17487/RFC0958, September 1985, <<https://www.rfc-editor.org/info/rfc958>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC5905] Mills, D., Martin, J., Ed., Burbank, J., and W. Kasch, "Network Time Protocol Version 4: Protocol and Algorithms Specification", [RFC 5905](#), DOI 10.17487/RFC5905, June 2010, <<https://www.rfc-editor.org/info/rfc5905>>.

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