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Network Time Protocol Last Extension Field  
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## Abstract

NTPv4 is defined by [RFC 5905](#) [[RFC5905](#)], and it and earlier versions of the NTP Protocol have supported symmetric private key MAC authentication. MACs pre-date the Extension Fields introduced in [RFC 5905](#) [[RFC5905](#)], and as the number of Extension Fields grows there is an increasing chance of ambiguity when deciding if the "next" set of data is an Extension Field or a MAC. This proposal defines a new Extension Field which is used to signify that it is the last Extension Field in the packet. If present, any subsequent data SHOULD be considered to be a legacy MAC.

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## [1.](#) Introduction

NTPv4 is defined by [RFC 5905](#) [[RFC5905](#)], and it and earlier versions of the NTP Protocol have supported symmetric private key MAC authentication. MACs pre-date the Extension Fields introduced in [RFC 5905](#) [[RFC5905](#)], and as the number of Extension Fields grows there is an increasing chance of ambiguity when deciding if the "next" set of data is an Extension Field or a MAC. This proposal defines a new Extension Field which is used to signify that it is the last Extension Field in the packet. If present, any subsequent data SHOULD be considered to be a legacy MAC.

### [1.1.](#) Requirements Language

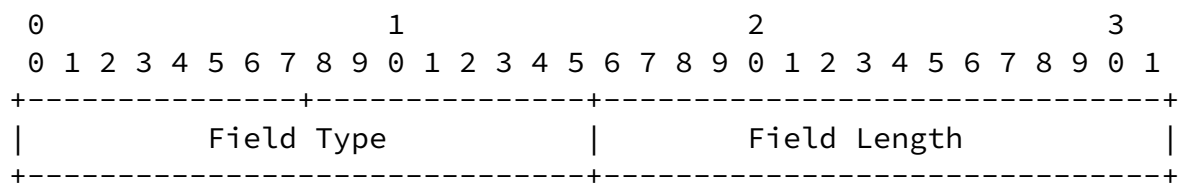
The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

## [2.](#) The Last Extension Field Extension Field

Now that multiple extension fields are a possibility, and the chance that additional packet data could be an Extension Field or an old-style MAC, having a means to indicate that there are no more Extension Fields in an NTP packet, and any subsequent data MUST be something else, almost certainly an old-style MAC, is a valuable facility.

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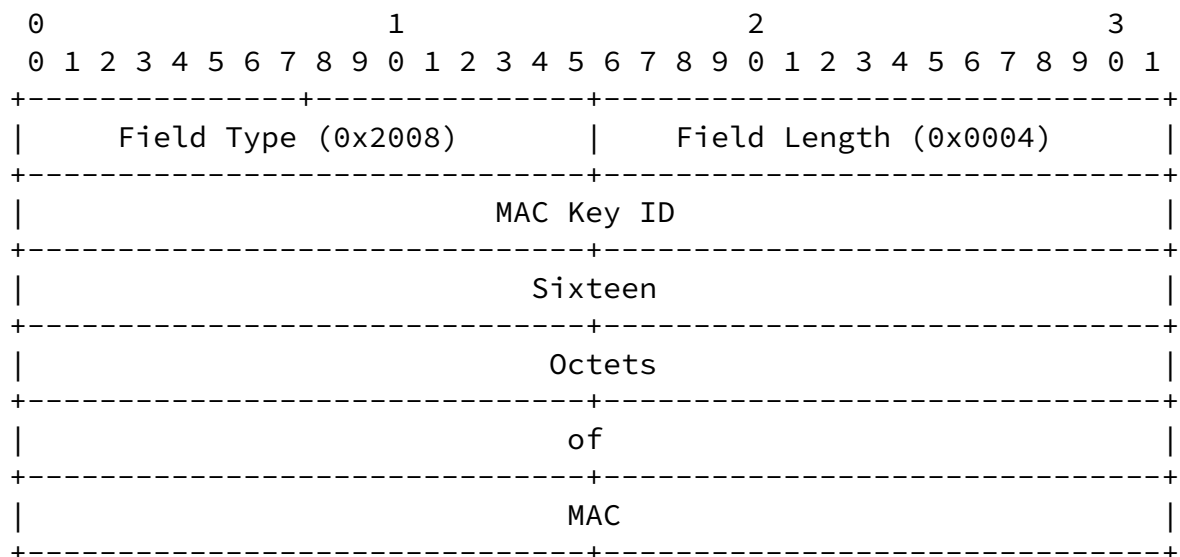
## NTP Extension Field: Last Extension Field

Field Type: TBD (Recommendation for IANA: 0x2008 (Last Extension Field, MAC OPTIONAL))

Field Length: 4

Payload: None.

Example:



## Example: NTP Extension Field: Last Extension Field

### 3. Acknowledgements

The author wishes to acknowledge the contributions of Joey Saccadonuts.

#### [4.](#) IANA Considerations

This memo requests IANA to allocate NTP Extension Field Types 0x0007 (I-Do), 0x2007 (I-Do, MAC OPTIONAL), 0x4007 (I-Do Response), and 0x6007 (I-Do Response, MAC OPTIONAL) for this proposal.

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#### [5.](#) Security Considerations

Additional information TBD

#### [6.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<http://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, <<http://www.rfc-editor.org/info/rfc5905>>.
- [RFC7384] Mizrahi, T., "Security Requirements of Time Protocols in Packet Switched Networks", [RFC 7384](#), DOI 10.17487/RFC7384, October 2014, <<http://www.rfc-editor.org/info/rfc7384>>.

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