Network Time Security

draft-ietf-ntp-network-time-security-14
draft-ietf-ntp-using-nts-for-ntp-05
draft-ietf-ntp-cms-for-nts-message-06

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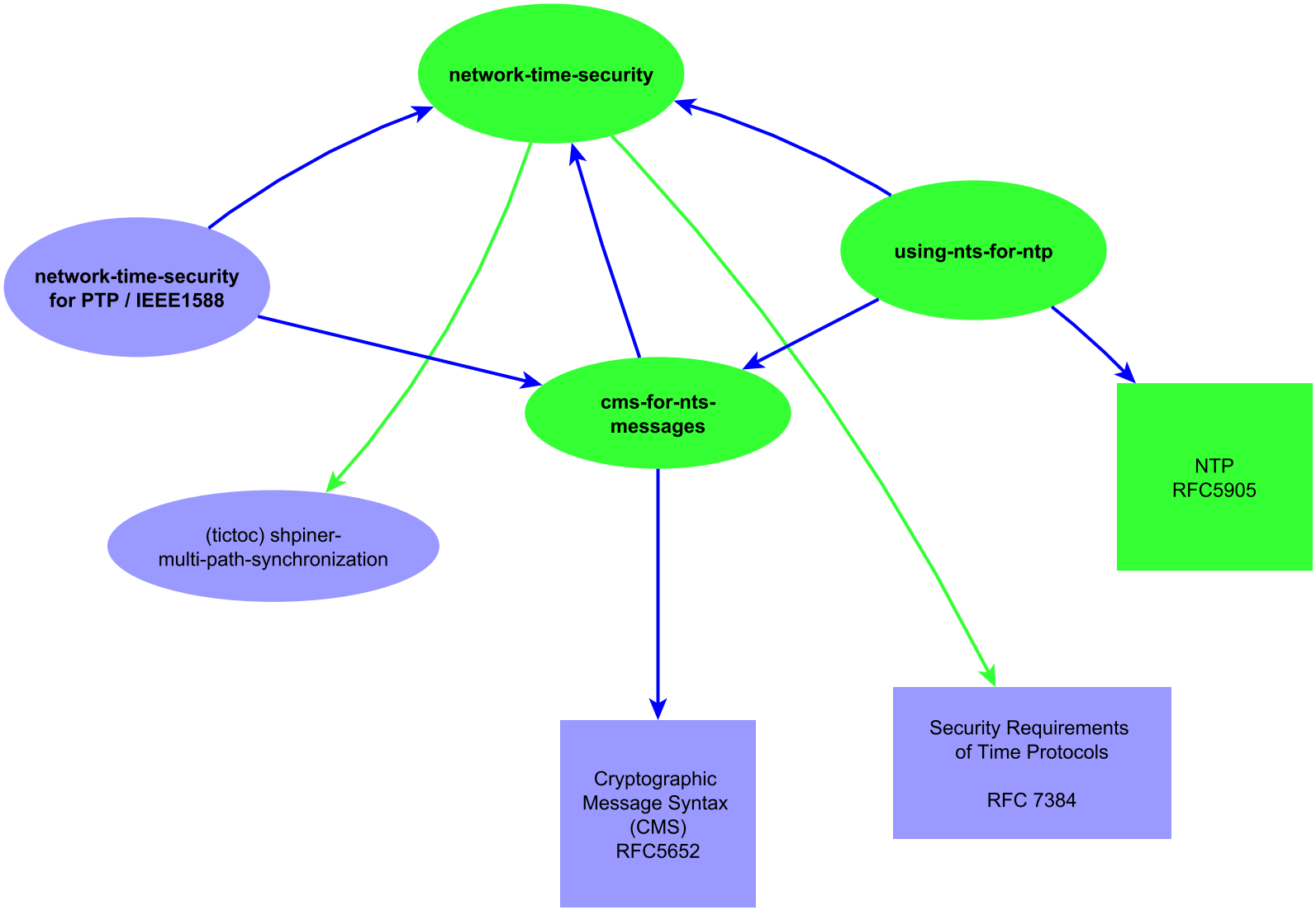
Outline

History

- **IETF 83:** Presentation of security issues of RFC 5906 (autokey)
- **IETF 84:** Presentation of plan for a new autokey standard
- **IETF 85–86:** I-D "draft-sibold-autokey-*nn*"
- **IETF 87–90:** I-D "draft-ietf-ntp-network-time-security-*nn*"
- **Since IETF 92:**
  - draft-ietf-ntp-network-time-security-*NN*
  - draft-ietf-ntp-cms-for-nts-message-*NN*
  - draft-ietf-ntp-using-nts-for-ntp-*NN*

New Structure: Overview



Scope

Network Time Security provides:

- Authenticity of time servers
- Ability to authenticate time clients to the server
- Ability to perform authorization checks for clients and servers
- Integrity of synchronization data packets
- Conformity with TICTOC's Security Requirements (RFC 7384)
- Support for NTP
- Ability for support of other time sync protocols, e. g. PTP

Implementation Status

Network Time Foundation

- Authentication framework (association, cookie exchange)
  - Coded, advanced testing still in progress
- Unicast time message exchange
  - Coding and testing in progress
- Allocation of OID values
  - testing using *unofficial* values
  - NTF has applied for a Private Enterprise Number (not going to be used)

Implementation Status

University of Applied Science Wolfenbüttel

- Currently: dealing with OpenSSL issues, getting underlying NTP implementation ready
- Next item: integrating NTS message exchanges
- Deadline: extended to July 2016

Major Changes in the drafts

Main Changes in Preparation for Last Call

- From last WG session:
  - Updates to IANA considerations
    (for early allocations)
  - Introduced MAC protection of time_request
  - Modification in use of CMS structures for carrying certificates
- Further description of using extended key usage identifiers
  (usage of certificates for authentication/authorization)
- Specification of ASN.1 structure of the MAC for NTP
- Cross-draft corrections (e.g. use of access messages)
- Editorial changes

Working Group Last Call

Feedback from WGLC – General NTS Issues (1)

- Commitment to HMAC as only MAC algorithm too strong?
  [x] *Changed across current NTS submission*
- NTS' proposed key exchange protocol:
  - Can it be condensed into fewer exchanges?
    [ ] *Could be done. Problem: server seed refresh*
  - Can it be executed with fewer cryptographic operations?
    [ ] *Combining of step 2 and 3 will reduce crypto operations*
    [ ] *Further reduction need feedback from the list*

Working Group Last Call

Feedback from WGLC – General NTS Issues (2)

- Why not use external protocols (e.g. IPsec, (D)TLS)?
  [x] *Some text in RFC 7384 & Security Considerations of NTS*
  [ ] *Could be treated in another document, e.g. NTP BCP(?): matching layers; precision; tailorability, . . .*
- Need further treatment of chicken-and-egg problem?
  (Need local time for security/need security for reliable time)
  [x] *Agreement: need assumptions in NTS docs*
  [ ] *Text still to be written*
  [ ] *In-depth discussion elsewhere?*
  (Same document as external protocols?)

Working Group Last Call

Feedback from Last Call – NTS-4-NTP Specific Issues

- How to deal with lost packets?
  [x] *Proposal(s) sent to mailing list*
  [ ] *Will treat in NTS documents, most likely NTS-4-NTP*
- How to treat NTP peer (symmetric) mode?
  [ ] *In discussion. RFC 5905 is not specific.*
- Should cipher suites be specified in more detail?
  [x] *Yes. Current "or stronger/weaker" wording is problematic*
  [ ] *How much detail?*
- Size of initial key exchange messages:
  How to deal with IP fragmentation issues?
  [ ] *How much of an issue is this?*
  [ ] *If difficult: piggybacking onto NTP packets still sensible?*

Next Steps

Next Steps

- Further discuss feedback from WGLC
- Include appropriate changes
- Schedule another WGLC