MANET Security

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draft-herberg-packetbb-sec-02

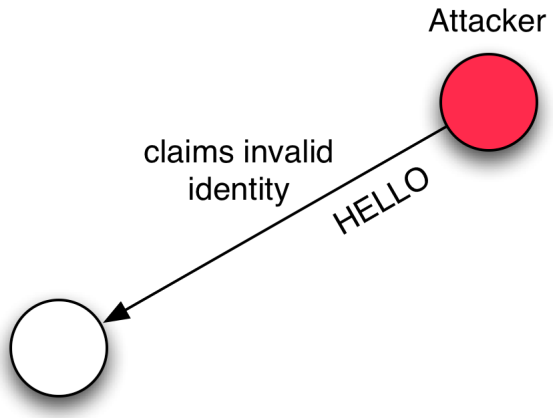
- RFC5444 is common building block in MANET protocol
- Proposed I-D is a common extension, intended to be applicable where 5444 is applicable.
- Has been presented and discussed at IETF ’75
- Simple mechanism for carrying a signature, as address block, message, packet TLV (and multi-value TLV)

Security Threats in MANETs

(for link state protocols such as NHDP/OLSRv2)

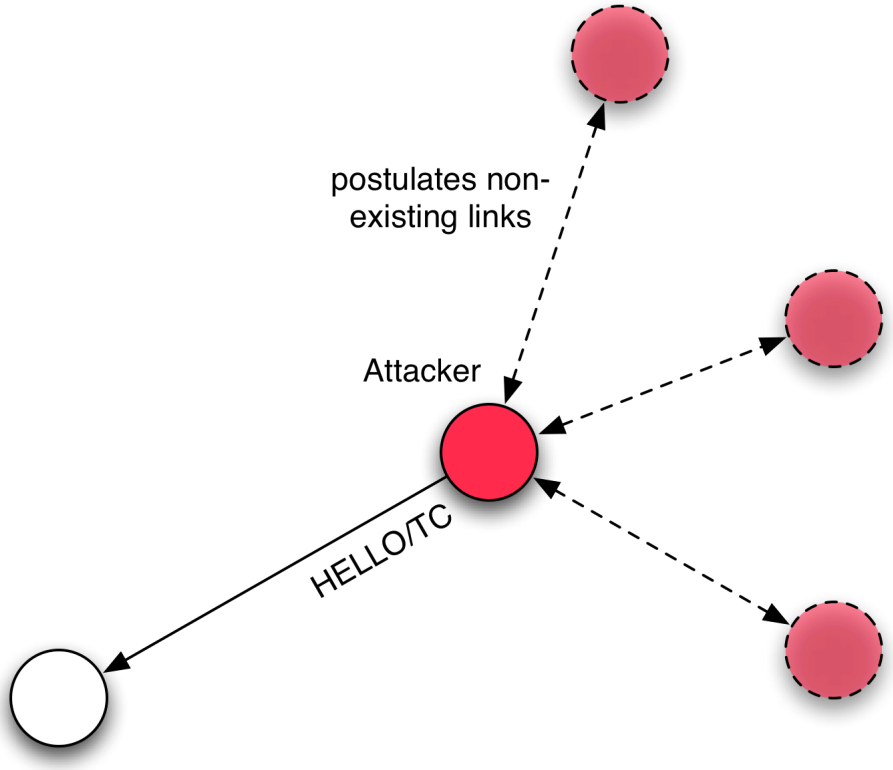
Security threats in MANETs

- Identity Spoofing



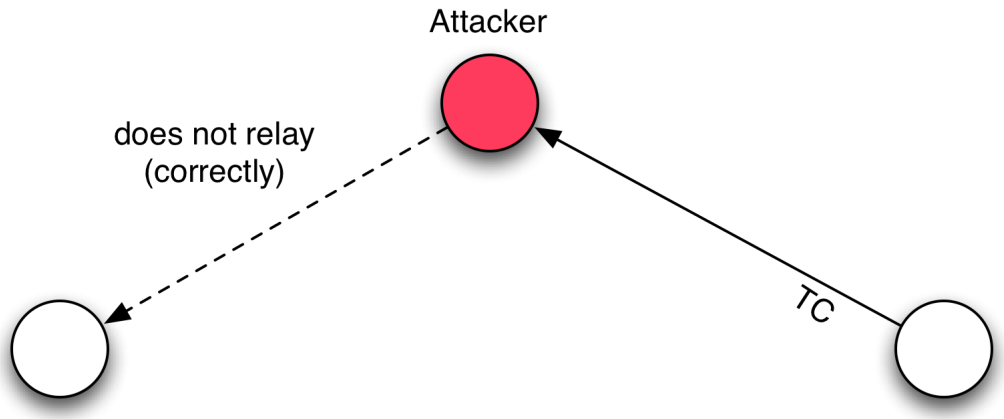
Security threats in MANETs

- Link Spoofing



Security threats in MANETs

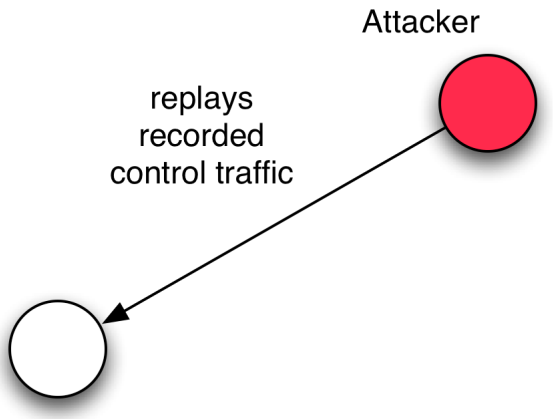
- Relaying



  - Incorrect control traffic relaying
  - Another common attack is relaying control traffic, but not data traffic (out of scope)

Security threats in MANETs

- Replaying



Security for NHDP/OLSRv2

- Digitally signed messages may be used to counteract identity spoofing
  - Allows to detect signature == identity
- Digitally signed messages may be used to counteract link spoofing
  - if signed by "both ends of the link”

- Pushes the problem to one of
  i. distributing keys and
  ii. preserving key confidentiality (of shared or private key)
- Does not preclude relay or replay attacks

Security for NHDP/OLSRv2

- draft-herberg-packetbb-sec: common format for RFC5444-based protocols
  - does not mandate or suggest crypto-mechanism (notably symmetric, asymmetric, id-based, etc.)

NHDP Security

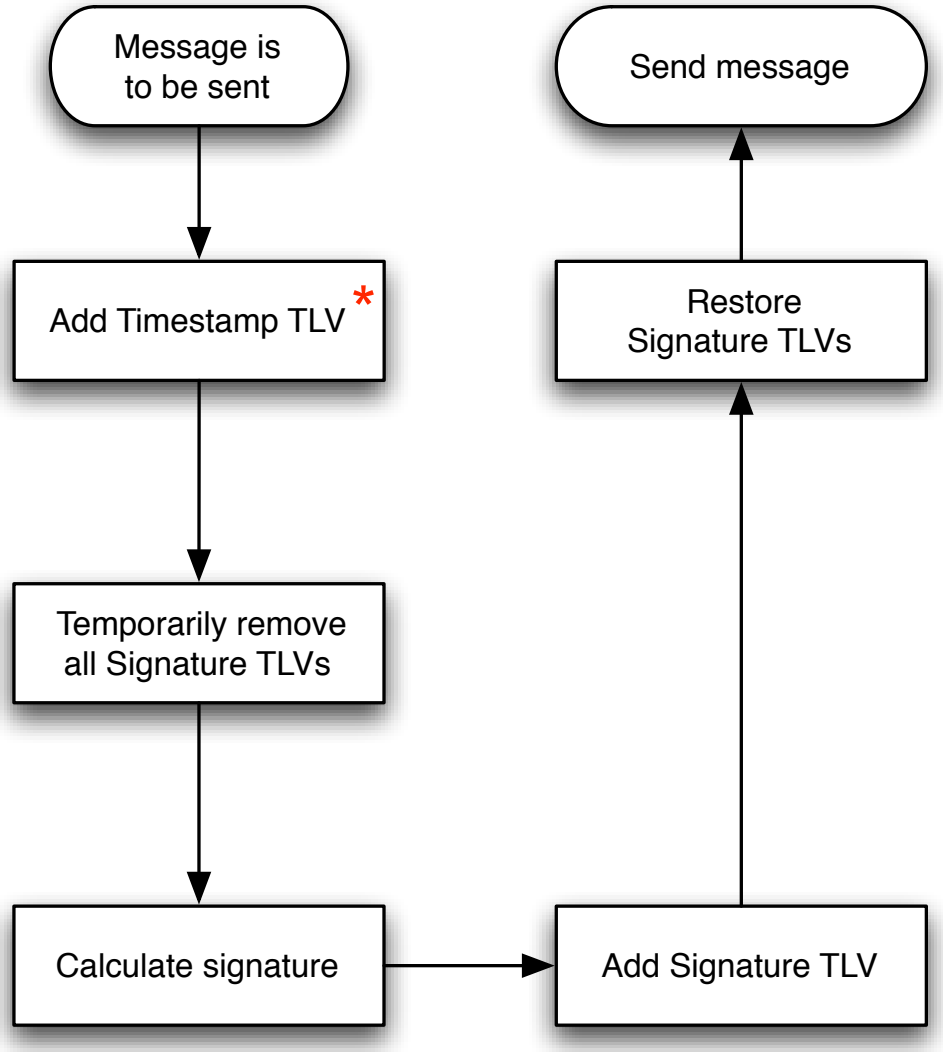
draft-herberg-nhdp-sec-threats-00

- Analysis of security threats to NHDP
- Analysis of security threats to protocols using NHDP for neighborhood discovery

draft-herberg-nhdp-sec-00

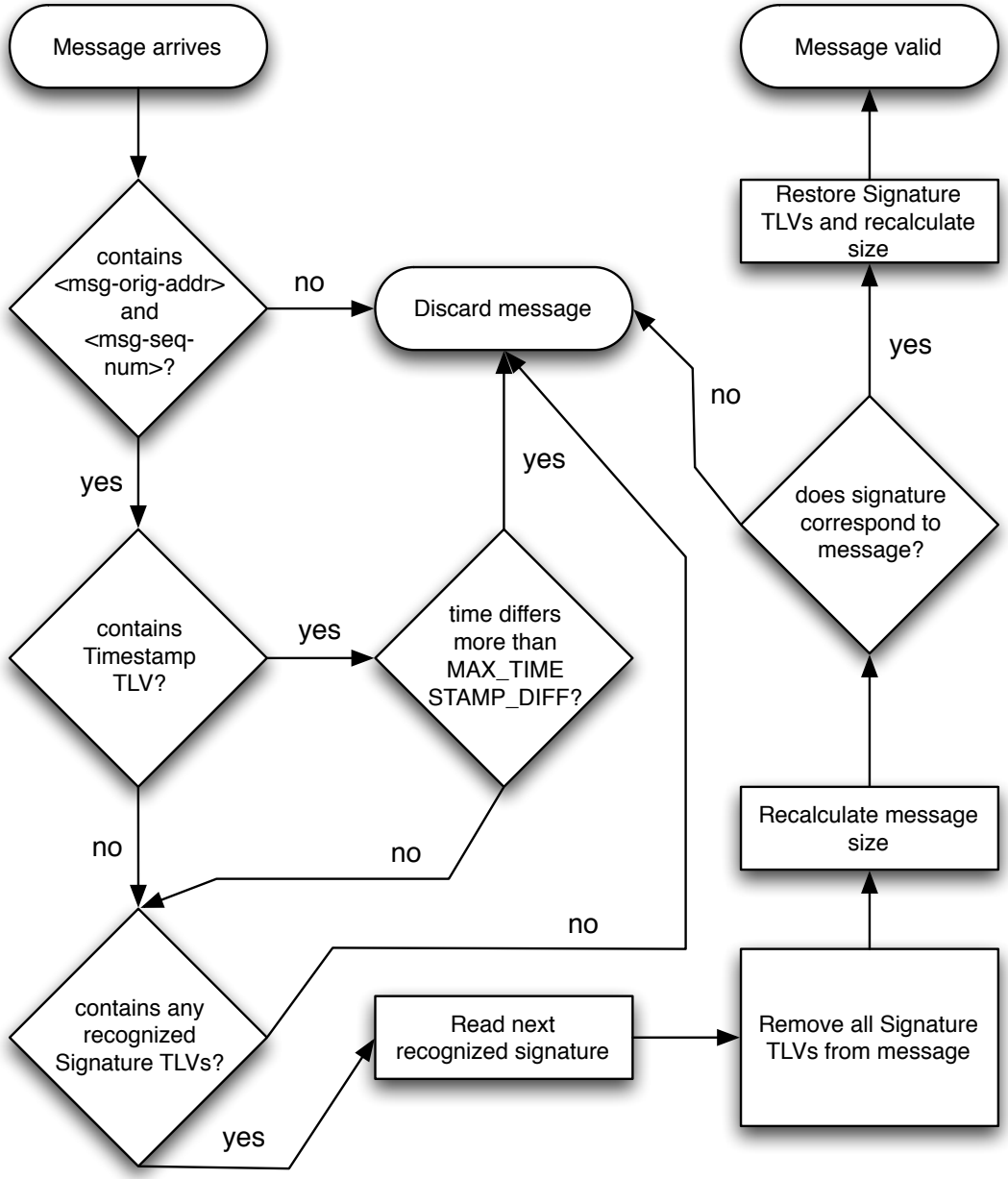
- In NHDP: “an implementation may recognize additional reasons for identifying that a message is malformed”
- This is what draft-herberg-nhdp-sec does, by specifying the process of digitally signing and validating messages in NHDP

Sender: Signing a HELLO message



* As defined in draft-herberg-packetbb-sec

Recipient: Recognizing a signed HELLO message as correct



Summary of NHDP security

- NHDP allows to reject messages for external reasons
- Based on draft-herberg-packetbb-sec
- draft-herberg-nhdp-sec provides a framework for signing and validating messages in NHDP
- Counteracts part of the security threats described in draft-herberg-nhdp-sec-threats

Key distribution and cryptographic algorithms

- No "one-size-fits-all", therefore:
  - Key distribution not addressed (application/deployment specific)
  - Key revocation not addressed (appl./depl. specific)
  - Cryptographic algorithm not suggested (appl./depl. specific)
    - Registries set up by draft-herberg-packetbb-sec for different algorithms

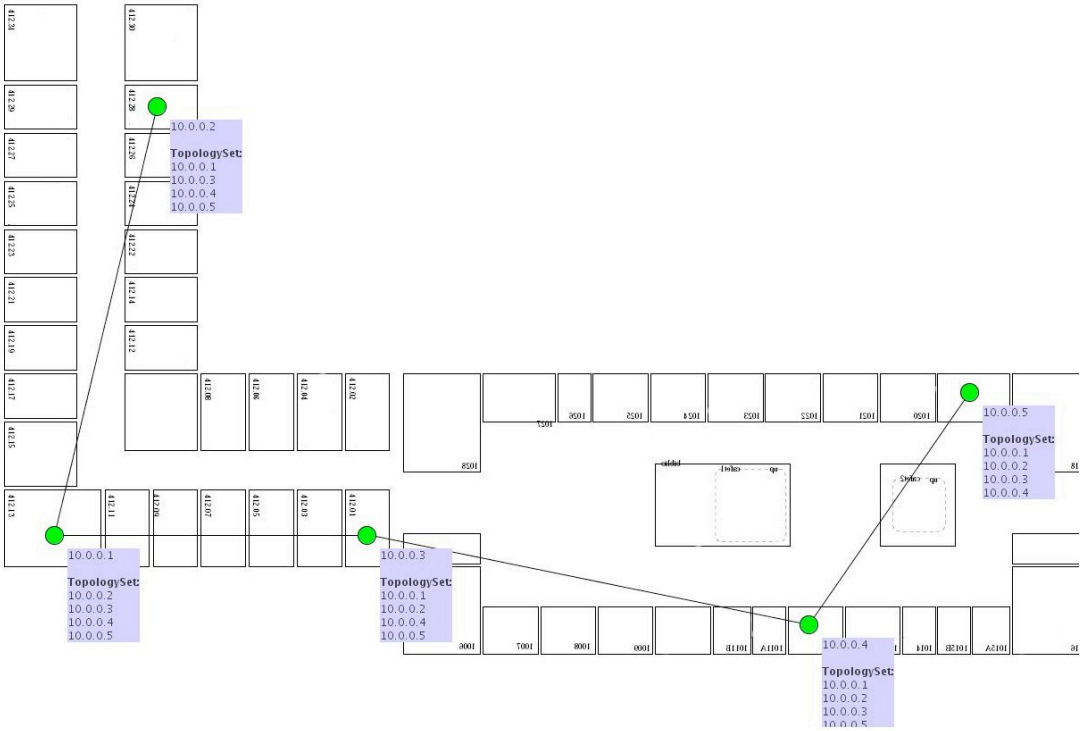
The way ahead

- Evaluate for dymo
  - Verify security considerations for dymo
  - Verify that draft-herberg-packetbb-sec TLV is sufficiently expressive
- Refine, update draft-herberg-packetbb-sec
- Publish draft-herberg-packetbb-sec as RFC?

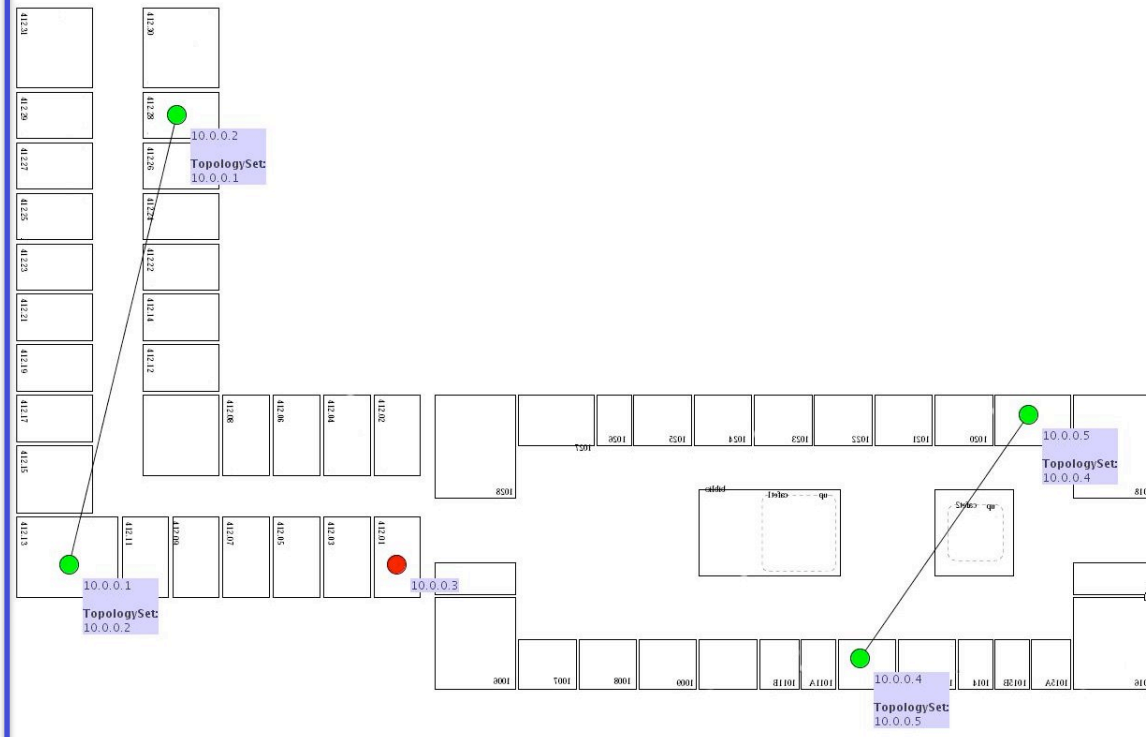
- Refine NHDP security documents (just submitted)
- Work-in-progress on similar OLSRv2 document, submission shortly after this IETF
  - similar in spirit to the NHDP document

Running code

- draft-herberg-packetbb-sec, draft-herberg-nhdp-sec, as well as the coming draft-herberg-olsrv2-sec are all implemented in "running code"



All routers using valid signed messages



Red router not signing messages