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# IPv6 Security: Attacks and Countermeasures in a Nutshell

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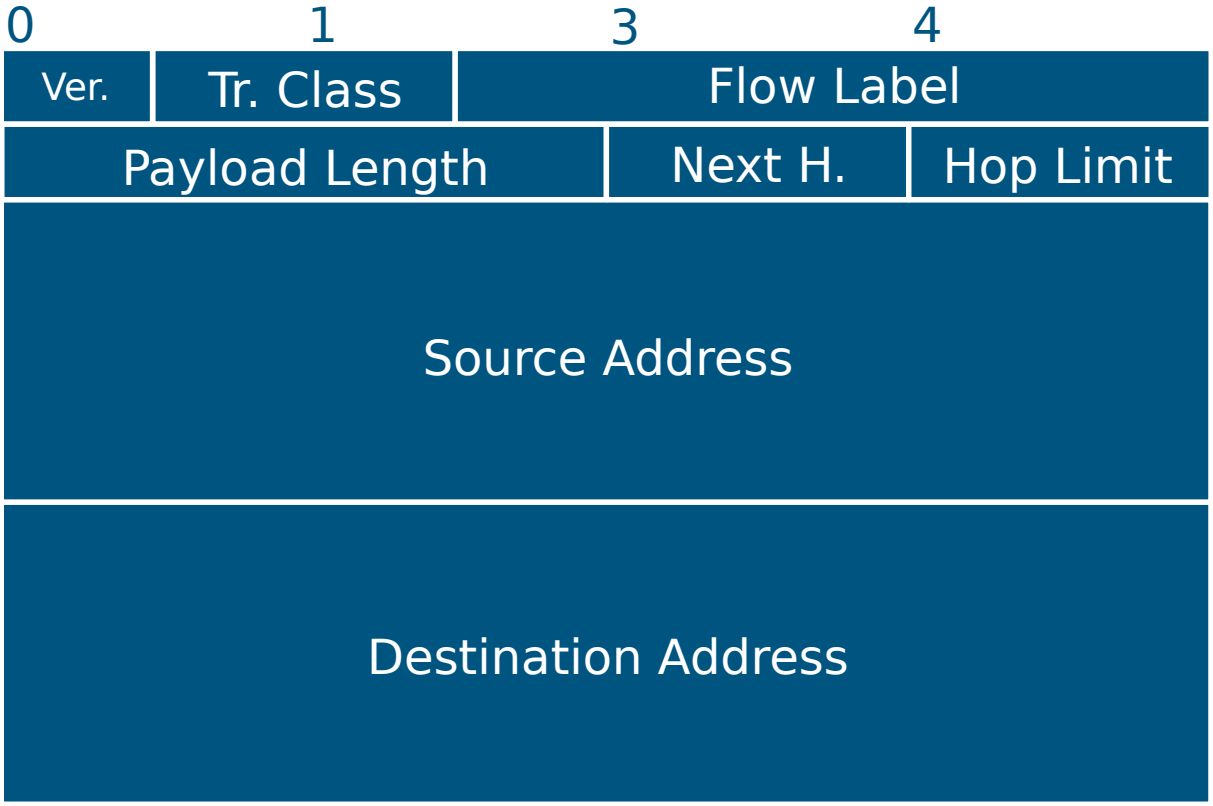
# Motivation

- Variety of sources
  (RFCs, blogs, ...)
- Systematization
  of attacks and countermeasures
- Identification of challenges

# IPv6 Header Format



# Systematization

- Vulnerabilities
  - action, object, target, result, origin, and modification
- Countermeasures
  - action, object, and activity level
- Evaluation
  - on vulnerabilities and adequate countermeasures

# Future Challenges

- Address assignment and structures
- Securing the local network
- Reconnaissance

# Addressing

- Stateless Autoconfiguration
  - Modified EUI-64 format
  - Privacy Extension
- DHCPv6
  - DHCP unique identifier
- Manual address assignment

# Securing the Local Network

- IPsec
  - Bootstrapping problems
  - Manual key assignment
- Secure Neighbor Discovery (SeND)
  - Cryptographically Generated Addresses
  - Signation of packets

# Reconnaissance

- Vast address space
- Alternatives
  - DNS querying
  - Messages to multicast addresses
  - Eavesdropping
- Active probing still promising
  - Address selection
  - Patterns?

# Conclusion

- Generation next – generation best?
  - Not less secure than IPv4
  - Transition technologies
- Challenges for the future remain ...