IPv6 Router Advertisement Guard (Ra-Guard) evasion

draft-gont-v6ops-ra-guard-evasion

Arturo Servín
LACNIC

81st IETF Meeting, Quebec, Canada
July 24-29, 2011

Introduction

- RFC 6104 introduces the problem statement of Rogue RAs
  - Focuses on misconfigured routers
  - Mentions different filtering criteria for filtering
  - Most basic filtering criterion based on the incomming port for the RA
- RFC 6105 specifies RA-Guard
  - Focuses on malicious routers (security)
  - Very brief Security Considerations section
- In many cases RA-Guard has been deployed and seen as a security mechanism
- It is a desired feature, since it parallells the DHCPv4-snooping of the IPv4 world

draft-gont-v6ops-ra-guard-evasion

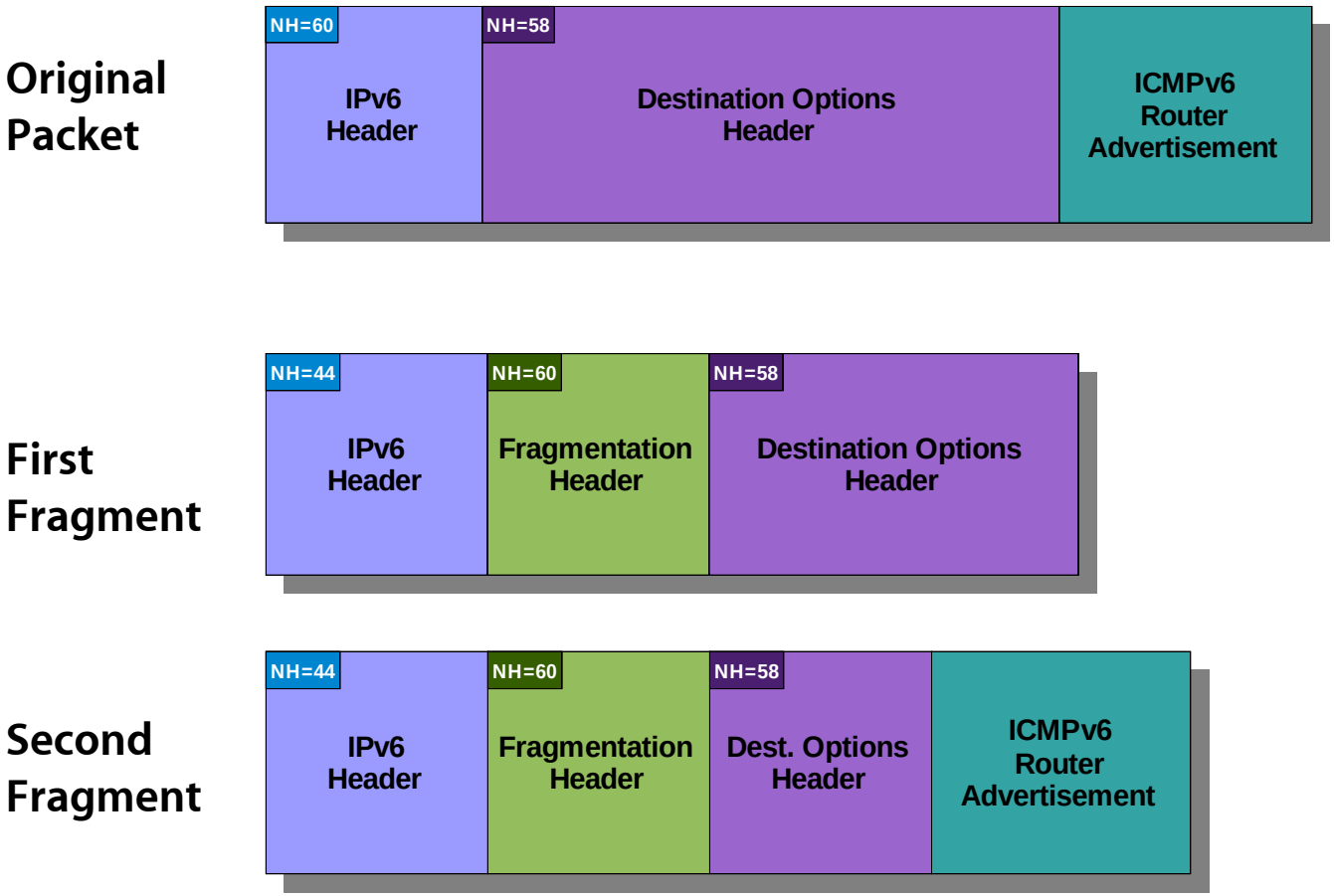
- Describes RA-Guard evasion techniques
- Describes more advanced filtering to mitigate them (operational mitigation)
- Formally updates RFC 6105 -> the RA-Guard spec is updated such that these issues are addressed
  - Enhances the Security Considerations
  - Mitigates RA-Guard evasion tehniques

Evasion technique #1

- RA-Guard implementations fail to process the entire IPv6 header chain

Evasion technique #2

- Combination of a Destination Options header and fragmentation:



Mitigation:

How to filter RAs:

1. Follow the entire IPv6 header chain (possibly enforcing a limit on number of Ext. Headers) -- drop the packet if it is an RA or the Ext. Header limit is hit.
2. If the upper layer protocol is not found (e.g. the packet is fragmented), and the IPv6 Src. Addr. is a link-local address, drop the packet ¥
3. Else, forward the packet

¥: RAs are required to use a link-local address

Discussion on the v6ops mailing-list

- Was mostly focused on draft-gont-6man-nd-extension-headers
  - Related I-D about prohibiting the use of some Ext. Headers with ND
- There seemed to be general agreement that these evasion techniques can be mitigated as proposed
- Moving forward:

Adopt this I-D as a v6ops wg item?