NDprotector, an implementation of RFC 3971 & RFC 3972

77th IETF

CGA & SEND maintenance WG

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Motivations

• Global context: MobiSEND project (see http://mobisend.org) financially supported by ANR (French 'National Research Agency')

• Initially, Arnaud Ebalard developed extensions to Scapy6 tool to handle SEND messages and options

• We needed an implementation that was easy to deploy, extend and configure
Requirements

- Linux kernel
- Userspace:
  - Modified version of Scapy6
  - OpenSSL
  - iproute2
  - ip6tables
  - netfilter_queue and python's netfilter_queue bindings
Implementation

- Hook in netfilter to redirect incoming and outgoing NDP packets to our implementations
- Accept/modify/drop NDP packets
- Scapy6 dissects the different layers and assembles new options (e.g. RSA Signature Option)
- Relies on radvd to send Router Advertisements
Basic configuration of Routers

You should only change:

- NDprotector.certification_path variable
- NDprotector.default_publickey variable

It will automatically:

- Assign a CGA for the link-layer prefix on 'eth0'
- Work in “mixed environment”
Basic configuration of Hosts

You should only change:

- NDprotector.trustanchors variable

It will automatically:

- Assign a CGA for the link-layer prefix on 'eth0'
- Check Certification Path of each router
Limitations

- Limited interaction with the kernel (must recreate internal Neighbor Cache structure)
- Run as “root”
Future work

- Inclusion in Scapy6 of some code
- Add Signature Agility support
- Add CRL check support
- Add rate limiting support
- (Eventually) add in-kernel CGA generation support
- Some code optimization (if required)
Thanks for listening

Questions ?
Thoughts ?
Improvements ?

• Download the implementation at: http://amnesiak.org/NDprotector/

• Compare it with slightly patched NTT DoCoMo implementation we maintain here: http://mobisend.org/software.html