NDprotector, an implementation of RFC 3971 & RFC 3972

77th IETF

-

CGA & SEND maIntenance WG

Tony Cheneau (TÉLÉCOM SudParis)
email: tony.cheneau@it-sudparis.eu
Arnaud Ebalard (EADS)

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 ingoing 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