

# IPsec flowcache replacement

Steffen Klassert

secunet Security Networks AG

Dresden

Linux IPsec Workshop, Dresden, March 27, 2018

## IPsec flowcache replacement

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?



## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
    - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?

## IPsec flowcache replacement

- ▶ The IPsec flowcache had a DoS problem (known since years)
- ▶ The IPsec flowcache was removed (Linux v4.14)
- ▶ The DoS problem with the flowcache went away.
- ▶ We lost the policy/SA lookup fastpath
- ▶ Slowpath lookup for policy + SA happens now for each packet
- ▶ How to solve this problem???
  - ▶ Fast lookup algorithm for policies and SAs (which one)?
  - ▶ Fast lookup algorithm for policies + cache SA at the policy?
  - ▶ Netfilter flowtable? (Pablo will tell more about that)
- ▶ Create an API to hook in different lookup methods?
  - ▶ Does that make sense?