**D5.4 Appendix G**

**Impact Analysis - Vertical 1 - Scenario 2**

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**Editor**

Sébastien Dupont (CETIC)

**Contributors** (ordered according to beneficiary numbers)

Guillaume Ginis, Philippe Massonet (CETIC)

Mirko Malacario, Claudio Porretti (LEO)

**Reviewers** (ordered according to beneficiary numbers)

Maximilian Tschirschnitz (TUM)

Rimantas Zylius (L3CE)

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**Executive** **Summary**

This document provides a sample impact analysis report for CAPE connected cars “Firewall update” demonstration scenario (Vertical 1 - Scenario 2). In this scenario, a new version of the firewall is available and needs to be deployed on platoon vehicles. From the certification point of view, if some certified requirements are impacted then the new firewall version must be re-certified on vehicles.

The document describes the change (firewall update), and the modifications to the affected developer evidences.

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# Introduction

In the SPARTA CAPE Vehicle to Infrastructure (V2I) firewall update scenario, a new version of the firewall is available and needs to be deployed on platoon vehicles. The update is performed when vehicles are not being driven. From the certification point of view, if some certified requirements are impacted then the new firewall version must be re-certified on vehicles. This requires following the certification process for the impacted parts.

**For the purpose of this demonstration, the assumption is that we base this impact analysis on preexisting accepted impact analysis reports and associated certification.**

The TOE is composed of the platooning software (SafSecPMM) and the firewall that are installed in platoon members as described in Figure 1 below.

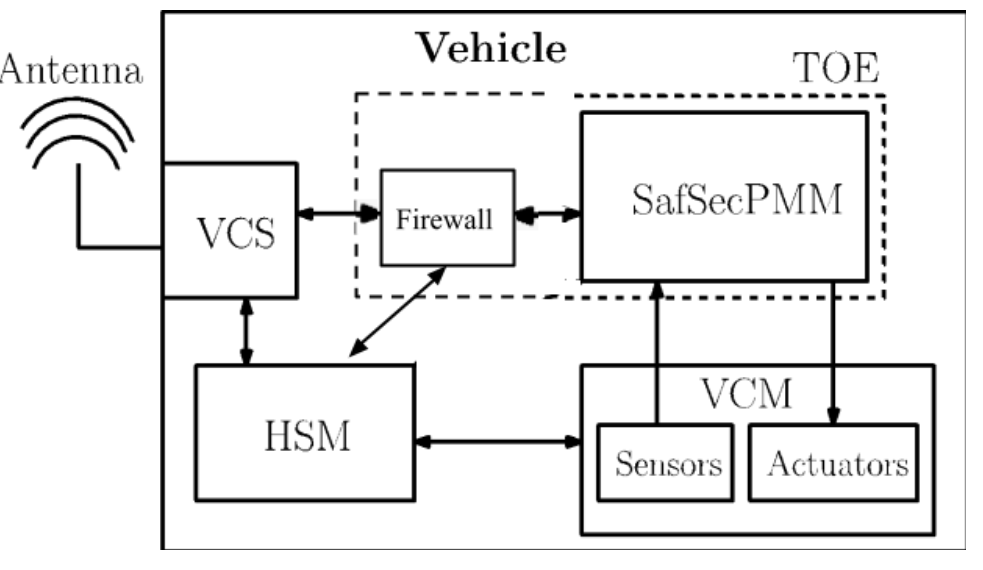


Figure 1: Target of evaluation

The firewall TSF (TOE Security Function) is composed of the green modules in Figure 2.

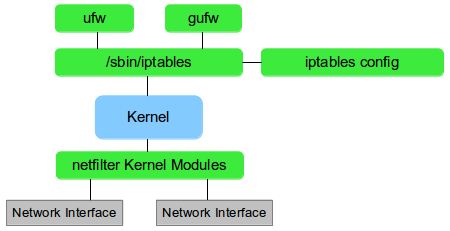


Figure 2: details of the firewall component of the TOE[[1]](#footnote-1)

The configuration controls identifiers of the TOE are shown in the following Table 1.

|  |  |
| --- | --- |
| **Evaluated Configuration (current)** | **Updated TOE Version (changes)** |
| iptables - version 1.8.6 - 2020-10-31 | iptables - version 1.8.7 - 2021-01-15 |
| SafSecPMM - version x.y.z | SafSecPMM - version x.y.z (no changes) |

Table 1: Main TOE Changes

# Description of the change(s)

The following changes to the certified product are identified: the version of the Firewall component has been updated[[2]](#footnote-2). The release notes below describe the changes for the new version of the firewall, with the associated author:

Florian Westphal (4):

[xtables-monitor: fix rule printing](https://git.netfilter.org/iptables/commit/?id=07af4da52ab3002c9cb510863b4eb7aaca4fb43b)

[xtables-monitor: fix packet family protocol](https://git.netfilter.org/iptables/commit/?id=946923b640afc2249cf98743ff60a97291108701)

xtables-monitor: print packet first

xtables-monitor:

Pablo Neira Ayuso (2):

tests: shell: update format of registers in bitwise payloads.

configure: bump version for 1.8.7 release

Phil Sutter (21):

[nft: Optimize class-based IP prefix matches](https://git.netfilter.org/iptables/commit/?id=323259001d617ae359430a03ee3d3e7f107684e0)

ebtables: Optimize masked MAC address matches

tests/shell: Add test for bitwise avoidance fixes

ebtables: Fix for broken chain renaming

iptables-test.py: Accept multiple test files on commandline

iptables-test.py: Try to unshare netns by default

libxtables: Extend MAC address printing/parsing support

xtables-arp: Don't use ARPT\_INV\_\*

xshared: Merge some command option-related code

tests/shell: Test for fixed extension registration

extensions: dccp: Fix for DCCP type 'INVALID'

[nft: Fix selective chain compatibility checks](http://git.netfilter.org/iptables/commit/?id=694612adf87fb614f16a2b678f32745d5c9d7876)

nft: cache: Introduce nft\_cache\_add\_chain()

nft: Implement nft\_chain\_foreach()

nft: cache: Move nft\_chain\_find() over

nft: Introduce struct nft\_chain

nft: Introduce a dedicated base chain array

nft: cache: Sort custom chains by name

tests: shell: Drop any dump sorting in place

nft: Avoid pointless table/chain creation

tests/shell: Fix nft-only/0009-needless-bitwise\_0

**source: IPTables 1.8.7 changelog**[[3]](#footnote-3)

Four changes in particular will be studied in this Impact Analysis Report (IAR) but the same process should be followed for all the changes.

Here is the description of these changes :

1. [xtables-monitor: fix rule printing](https://git.netfilter.org/iptables/commit/?id=07af4da52ab3002c9cb510863b4eb7aaca4fb43b): trace\_print\_rule does a rule dump. This prints unrelated rules in the same chain. Instead the function should only request the specific handle. Furthermore, flush output buffer afterwards so this plays nice when output isn't a terminal.
2. [xtables-monitor: fix packet family protocol](https://git.netfilter.org/iptables/commit/?id=946923b640afc2249cf98743ff60a97291108701): This prints the family passed on the command line (which might be 0). Print the table family instead.
3. [nft: Optimize class-based IP prefix matches](https://git.netfilter.org/iptables/commit/?id=323259001d617ae359430a03ee3d3e7f107684e0): Payload expression works on byte-boundaries, leverage this with suitable prefix lengths. (discussion)
4. [nft: Fix selective chain compatibility checks](http://git.netfilter.org/iptables/commit/?id=694612adf87fb614f16a2b678f32745d5c9d7876): Since commit 80251bc2a56ed ("nft: remove cache build calls"), 'chain' parameter passed to nft\_chain\_list\_get() is no longer effective. Before, it was used to fetch only that single chain from kernel when populating the cache. So the returned list of chains for which compatibility checks are done would contain only that single chain. Re-establish the single chain compat checking by introducing a dedicated code path to nft\_is\_chain\_compatible() doing so.

No changes to the development environment of the certified ToE have been identified.

# Description of the developer evidence modifications

|  |  |  |  |
| --- | --- | --- | --- |
| **Classes** | **Name** | **Description** | **Changes** |
| ALC  (LifeCycle Support) | FW Release notes | Release notes of the firewall | firewall version update |
| ASE  (Security Target Evaluation) |  |  |  |
| ADV  (Development) |  |  |  |
| AGD  (Guidance Document) |  |  |  |
| ATE  (Functional Tests) |  |  |  |
| AVA  (Vulnerability Assessment) |  |  |  |

Table 2: classes vs. evidences

|  |  |
| --- | --- |
| **Name** | **Description** |
| ST/PP | Updated Protection Profile |
| Sw Architecture | Architecture document |
| Functional specification | Software Requirements specification |
| Risk assessment | Risk assessment report |
| Threat analysis | Threat model and analysis |
| CI/CD | Configuration and execution logs |
| Vulnerability scans report | Results of the vulnerability scans |
| Test Report | Results of the functional tests |
| Installation Manual | SafeSecPMM Installation & Update Manual |
| Fuzzing Logs | Results of the fuzzing tests |

Table 3: classes vs. evidences

1. reference image: <https://xerocrypt.wordpress.com/2013/08/26/what-exactly-are-netfilter-and-iptables/> [↑](#footnote-ref-1)
2. Firewall rules are not updated [↑](#footnote-ref-2)
3. <https://www.netfilter.org/projects/iptables/files/changes-iptables-1.8.7.txt> [↑](#footnote-ref-3)