Middlebox Simulator

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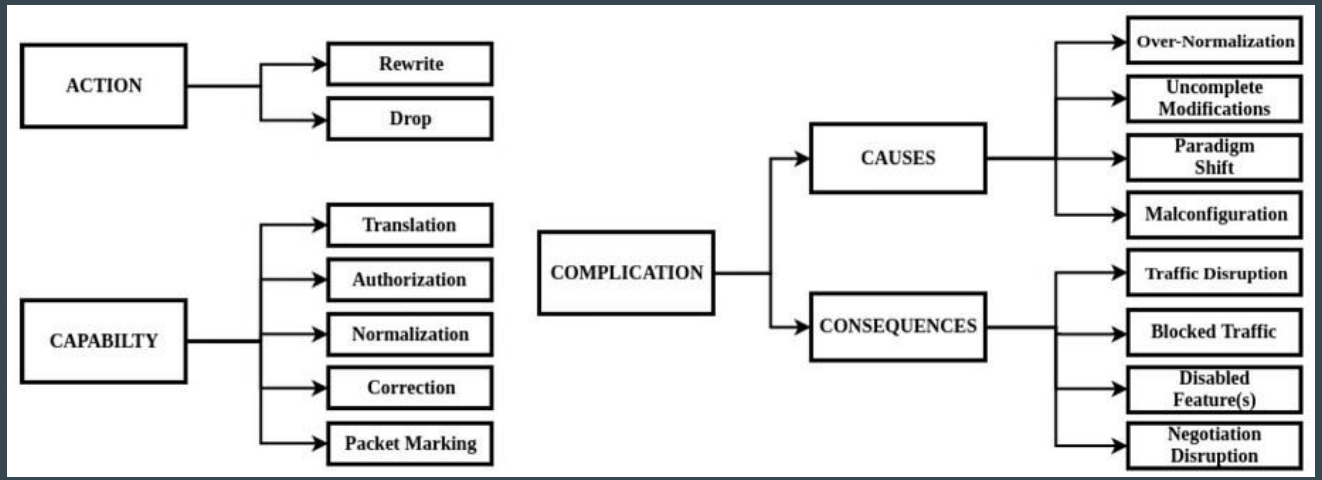
Using VPP (FD.io)

https://github.com/mami-project/vpp-mb

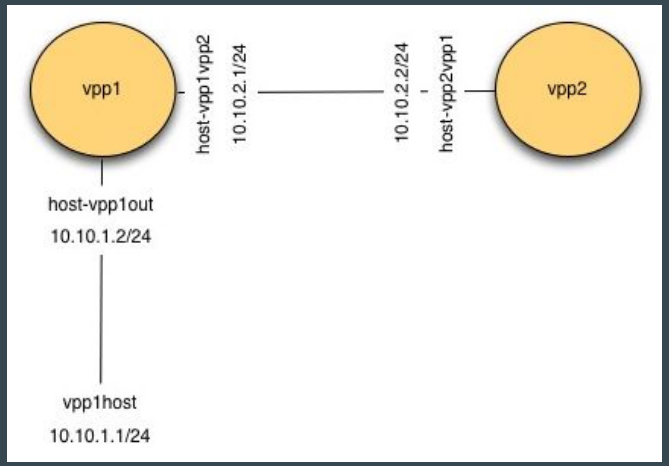
Introduction

Goal: **simulate** middleboxes behavior

Middlebox Policy Taxonomy



Environment (virtual and/or physical)



Currently: (example of) a topology running multiple instances of VPP **inside ONE virtual machine**

→ lighter, faster, easier than using multiple VMs

But could work with only one VPP instance running on a machine, or the VM could also communicate with other VMs/devices

Modular Middlebox (MMB) plugin

MMB-cli command: mmb add <match> [<match> ...] <target> [<target> ...]

```
$sudo vppctl mmb add tcp-dport 80 mod 443
```
Rewrite TCP port 80 to port 443

```
$sudo vppctl mmb add tcp-opt-mss strip tcp-opt-mss
```
Strip mss option

```
$sudo vppctl mmb add tcp-opt-mss > 1500 mod tcp-opt-mss 1460
```
If MSS is larger than 1500, set it to 1460

```
$sudo vppctl mmb add ip-proto tcp strip ! tcp-opt-mss
```
Strip all options but MSS

```
$sudo vppctl mmb add ip-proto tcp strip tcp-opt-mss strip tcp-opt-wscale
```
Strip MSS and WSCALE

```
$sudo vppctl mmb add tcp-opt-timestamp strip all
```
Strip all options if packet contains timestamp option

```
$sudo vppctl mmb add ip-proto tcp strip ! tcp-opt-mss tcp-opt-wscale
```
Strip all options except mss and wscale if packet contains timestamp option (whitelist)

```
$sudo vppctl mmb add ip-proto tcp strip tcp-opt-mss tcp-opt-wscale
```
Strip all mss and wscale if packet contains timestamp option (blacklist)

```
$sudo vppctl mmb add tcp-opt ! tcp-opt-mss ! tcp-opt-wscale drop
```
Drop all TCP packets with options different than MSS or WScale.

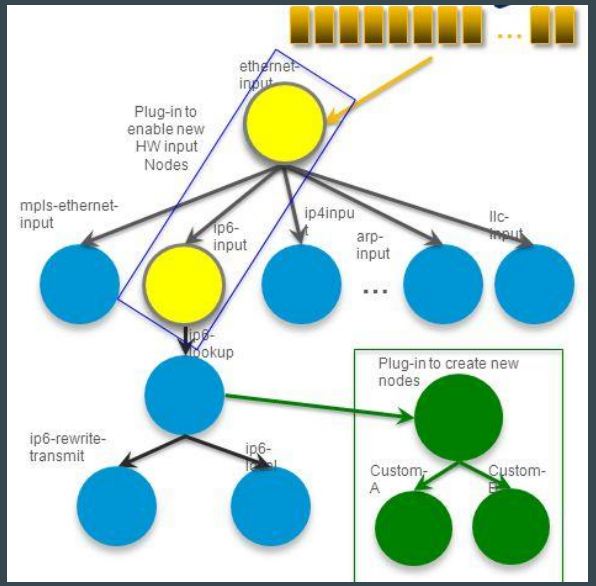
```
$sudo vppctl mmb add ip-proto tcp ! tcp-opt-mss ! tcp-opt-wscale drop
```
Drop all TCP packets that do not contain MSS nor WScale.

```
$sudo vppctl mmb add ip-proto tcp tcp-opt 22 drop
```
Drop all TCP packets that contain option 22

Grammar is defined here:

https://github.com/mami-project/vpp-mb/blob/master/user-guide.pdf

Work in progress / Planned



- MMB Plugin introduces a new node in VPP to simulate middleboxes behavior
- GUI for the simulator
- Stateful policies