Measurement and Architecture for a Middleboxed Internet

User Guide for mmb 0.1

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1 mmb

mmb (modular middlebox) is a vpp plugin that performs various middlebox behaviors.

2 mmb CLI guide

2.1 add/remove policies

`mmb <action> <match> [<match> ...] <target> [<target> ...]`

- `<action>`
  SYNTAX : `add|del`
  This parameter determines the action applied on the policy list.
  Allowed values:

  - `add` : add a policy to mmb
  - `del` : remove a policy from mmb
  - `list` : list the policies in the policy list.

- `<match>`
  SYNTAX : `<field> [[<cond>] <value>]`
  This parameter is a constraint that determines the packets on which the policy will operate.

- `<target>`
  SYNTAX : `mod [...]|strip [...]|drop`
  This parameter determines the action to apply on matched packets.

  - `mod [<field>] [<value>]` : modify a field on a packet
  - `strip [<field>]` : strip a field from a packet (applicable only to options)
  - `drop` : drop a packet

2.1.1 <cond>

The condition applied on a `<value>` from a `<field>` to form a constraint.
Available conditions: ==, !=, <=, >=, <, >.

2.1.2 <field>

Available fields:

- protocols[1]: `ip`, `tcp`, `udp`, `icmp`

- IPv4 fields: `ip-ver`, `ip-ihl`, `ip-dscp`, `ip-ecn`, `ip-non-ect`[2], `ip-ect0`[2], `ip-ect1`[2], `ip-ce`[2], `ip-len`, `ip-id`, `ip-flags`, `ip-res`, `ip-df`, `ip-mf`, `ip-frag-offset`, `ip-ttl`, `ip-proto`, `ip-checksum`, `ip-saddr`[3], `ip-daddr`[3], (`ip-opt`).

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[1]applicable only to `<match>`
[2]not followed by `<value>`
[3] the following `<value>` can include a subnet mask, the == condition will become subnet matching

- ICMPv4 fields: `icmp-type`, `icmp-code`, `icmp-checksum`, `icmp-payload`.

- UDP fields: `udp-sport`, `udp-dport`, `udp-len`, `udp-checksum`,`.udp-payload`.

- TCP fields: `tcp-sport`, `tcp-dport`, `tcp-seq-num`, `tcp-ack-num`, `tcp-offset`, `tcp-res`, `tcp-cwr`, `tcp-ece`, `tcp-urg`, `tcp-ack`, `tcp-push`, `tcp-res`, `tcp-syn`, `tcp-fin`, `tcp-flags`, `tcp-win`, `tcp-checksum`, `tcp-urg-ptr`, `tcp-payload`, `tcp-opt-mss`, `tcp-opt-wscale`, `tcp-opt-sackp`, `tcp-opt-sack`, `tcp-opt-timestamp`, `tcp-opt-fast-open`, `tcp-opt-fast-open`.

- Custom TCP options: `tcp-opt <kind>`

- Special options:

  - Do not recompute the checksum

2.1.3 `<value>`

The value of a field in decimal or in hexadecimal if preceeded by `0x`.

2.1.4 Examples

```
$sudo vppctl mmb add ip-ecn mod 0
```
ECN bleaching

```
$sudo vppctl mmb add udp drop
```
Block

```
$sudo vppctl mmb add ip-proto != tcp drop
```
Block every IP protocol but TCP

```
$sudo vppctl mmb add ip-proto != tcp ip-proto != udp drop
```
Block every IP protocol but TCP and UDP

```
$sudo vppctl mmb add ip-proto != tcp drop
```
Block TCP and UDP

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

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

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

2.2   stateful polices