

NAME

ematch - extended matches for use with basic or flow filters

SYNOPSIS

tc filter add .. basic match *EXPR* .. **flowid** ..

EXPR := *TERM* [{ **and** | **or** } *EXPR*]

TERM := [**not**] { *MATCH* | '(' *EXPR* ')' }

MATCH := *module* '(' *ARGS* ')'

ARGS := *ARG1 ARG2* ..

MATCHES**cmp**

Simple comparison ematch: arithmetic compare of packet data to a given value.

cmp(*ALIGN* at *OFFSET* [*ATTRS*] { *eq* | *lt* | *gt* } *VALUE*)

ALIGN := { *u8* | *u16* | *u32* }

ATTRS := [layer *LAYER*] [mask *MASK*] [trans]

LAYER := { *link* | *network* | *transport* | *0..2* }

meta

Metadata ematch

meta(*OBJECT* { *eq* | *lt* | *gt* } *OBJECT*)

OBJECT := { *META_ID* | *VALUE* }

META_ID := *id* [shift *SHIFT*] [mask *MASK*]

meta attributes:

random 32 bit random value

loadavg_1 Load average in last 5 minutes

nf_mark Netfilter mark

vlan Vlan tag

sk_rcvbuf Receive buffer size

sk_snd_queue Send queue length

A full list of meta attributes can be obtained via

```
# tc filter add dev eth1 basic match 'meta(list)'
```

nbyte

match packet data byte sequence

nbyte(*NEEDLE* at *OFFSET* [layer *LAYER*])

NEEDLE := { *string* | *c-escape-sequence* }

OFFSET := *int*

LAYER := { *link* | *network* | *transport* | *0..2* }

u32

u32 ematch

u32(ALIGN VALUE MASK at [nexthdr+] OFFSET)

ALIGN := { u8 | u16 | u32 }

ipset

test packet against ipset membership

ipset(SETNAME FLAGS)

SETNAME := string

FLAGS := { FLAG [, FLAGS] }

The flag options are the same as those used by the iptables set match.

When using the ipset ematch with the `ip_set_hash:net,iface` set type, the interface can be queried using `src,dst` (source ip address, outgoing interface) or `src,src` (source ip address, incoming interface) syntax.

CAVEATS

The ematch syntax uses `'(' and ')'` to group expressions. All braces need to be escaped properly to prevent shell commandline from interpreting these directly.

When using the ipset ematch with the `ifb` device, the outgoing device will be the `ifb` device itself, e.g. `ifb0`. The original interface (i.e. the device the packet arrived on) is treated as the incoming interface.

EXAMPLE & USAGE

```
# tc filter add .. basic match ...
```

```
# 'cmp(u16 at 3 layer 2 mask 0xff00 gt 20)'
```

```
# 'meta(nfmark gt 24)' and 'meta(tcindex mask 0xf0 eq 0xf0)'
```

```
# 'nbyte(ababa at 12 layer 1)'
```

```
# 'u32(u16 0x1122 0xffff at nexthdr+4)'
```

Check if packet source ip address is member of set named **bulk**:

```
# 'ipset(bulk src)'
```

Check if packet source ip and the interface the packet arrived on is member of `hash:net,iface` set named **interactive**:

```
# 'ipset(interactive src,src)'
```

AUTHOR

The extended match infrastructure was added by Thomas Graf.