Vuurmuur - iptables manager

Victor Julien

July 7, 2014

About me

Vuurmuur

- 'founder' and lead developer of Vuurmuur

Open Source

- Suricata IDS/IPS
- ModSecurity, libhtp, modsec2sguil, sguil, snort_inline

Contact

- @inliniac
- http://blog.inliniac.net/

iptables

Powerful, but complex

- Packet processing happens in several tables: mangle, filter, nat, raw
- Default chains: INPUT, OUTPUT, FORWARD and several others
- Also, define your own chains
- Don’t get me started on traffic shaping

Rule Example

Example of a rule:

```
iptables -t filter -A FORWARD -i eth1 -o ppp0                    \
    -p tcp -m tcp --syn                                          \
    -s 192.168.0.33/255.255.255.255 --sport 1024:65535           \
    -d 0.0.0.0/0.0.0.0 --dport 4070                              \
    -m limit --limit 5/sec --limit-burst 10                      \
    -m conntrack --ctstate NEW                                   \
    -j NFLOG --nflog-prefix "ACCEPT   " --nflog-group 9
```

Rather complex, right?

Vuurmuur

- Started in 2002 as a project to learn programming
- Born out of frustration with managing iptables scripts
- Mature, free-time project
- Therefore, slow moving project :)

Vuurmuur

Goal

Allow users to easily setup and manage a secure and efficient firewall, without needing iptables specific knowledge.

Vuurmuur

Features

- Ncurses GUI – manage over SSH
- Target is gateway firewalls
- Log viewer, connection viewer
- Easy way to setup NAT, portforwarding
- NFQUEUE support for integrating with Suricata IPS
- Basic traffic shaping and prioritization support
- Basic IPv6 support
- Keeps an 'audit log' of all changes

Ncurses

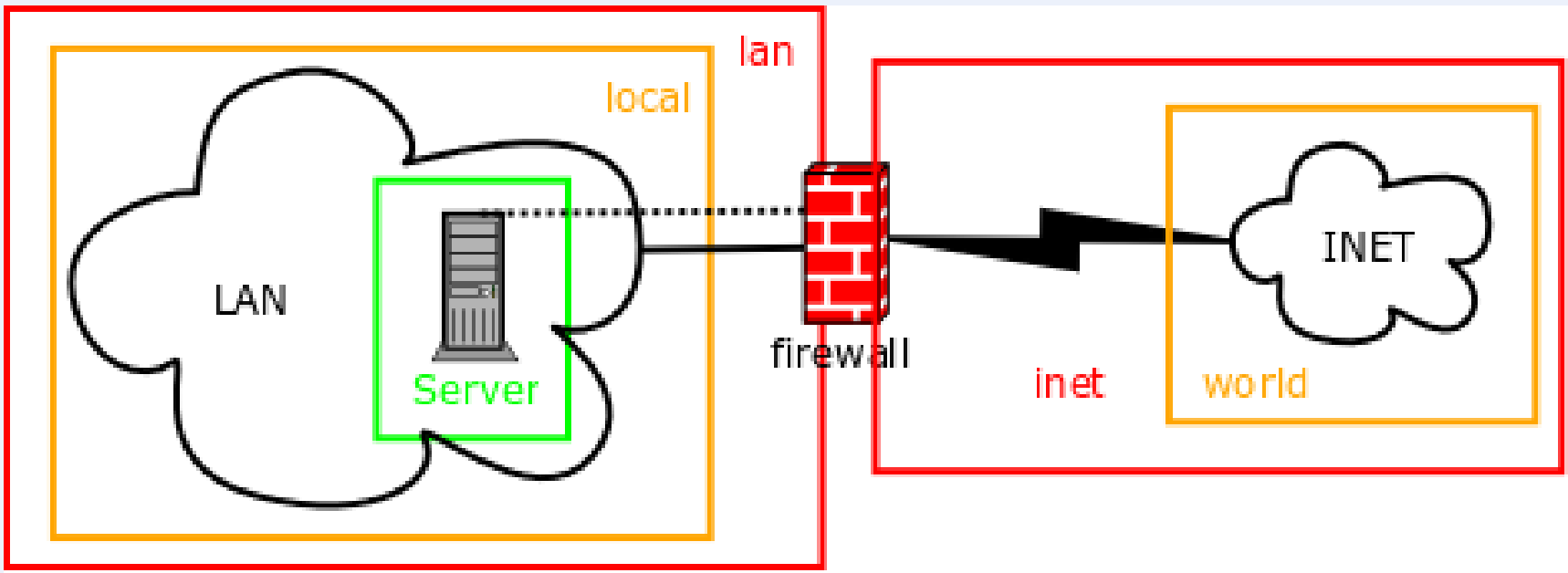

Main
F12:help
t400s
Main Menu
Welcome to Vuurmuur_conf 0.8rc1
-Rules (F9)
BlockList (b)
Zones (F7)
Interfaces
Services (F8)
Vuurmuur Config (F6)
Logview
Status (s)
Connections (c)
Traffic Volume (a)
Vuurmuur_conf Settings
Apply Changes (F11)
About
Quit (F10)
Overall [OK]
Backend [OK]
Config [OK]
Settings [OK]
Daemons [OK]
System [OK]
Press F5 for details.
Status
Ready.
user: victor

Vuurmuur

Concepts

- One or more 'zones': in/out, lan/wan, red/green
- Within each zone: one or more networks
- Within each network: one or more hosts (optional)
- Interface mapping with local interfaces
- Interfaces are connected to a network
- Services define protocols and ports

Concepts



Rules

Rule Example

- accept service http from local.lan to world
- snat service http from local.lan to world

About the names

- Zone names have a fixed structure
- "local.lan" means: zone "lan" and within that network "local"
- In "server.local.lan", "server" is the host
- This way it's always clear what part of your network a rule applies to

Rules

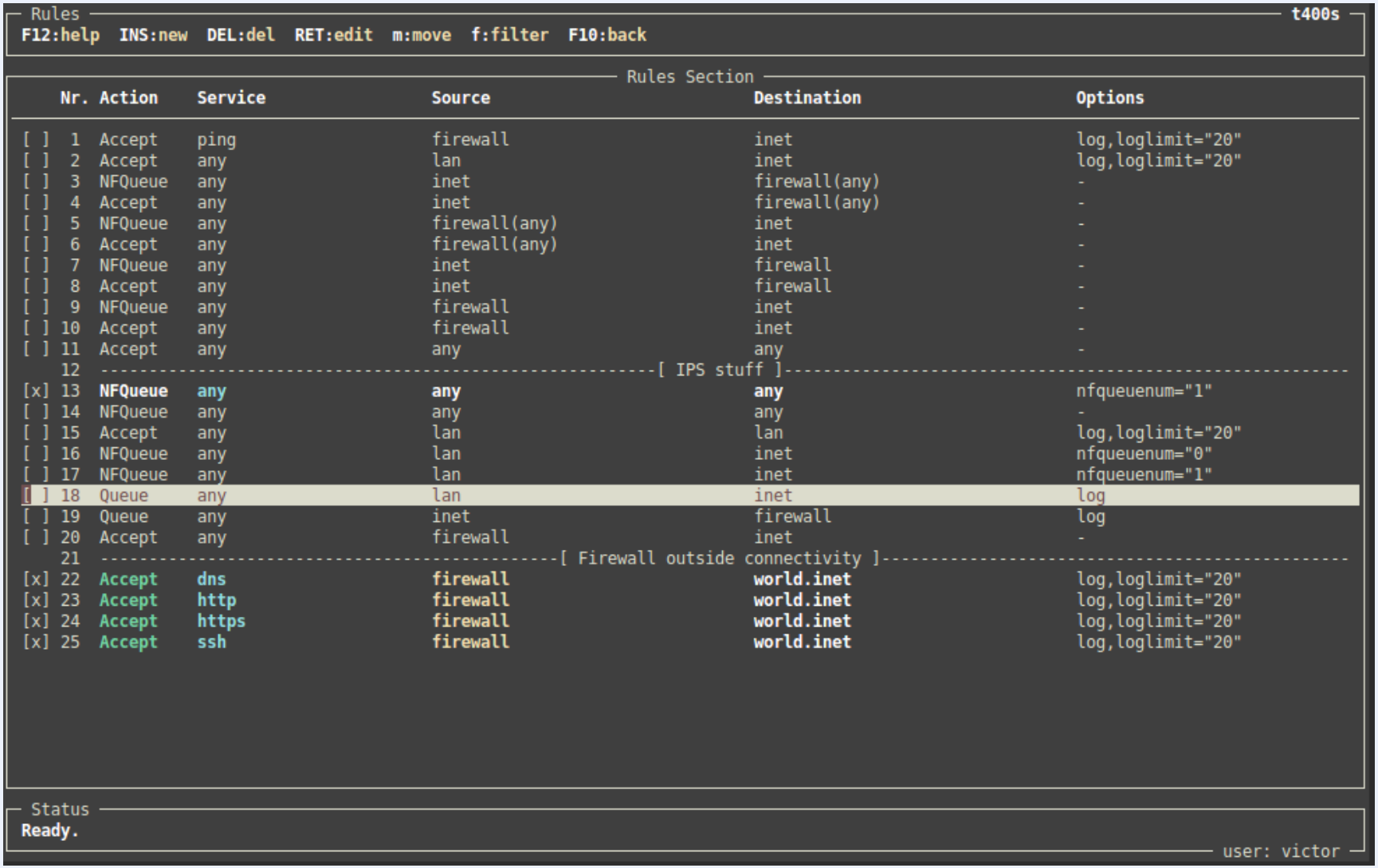
Port forwarding rule Example

- portfw service ssh from world to myserver.servers.dmz

Port forwarding rule example, with NFQUEUE

- nfqueue service smtp from world to mailserver.servers.dmz
- dnat service smtp from world to mailserver.servers.dmz

Rules


Rules
t400s
F12:help INS:new DEL:del RET:edit m:move f:filter F10:back
Rules Section
Nr. Action Service Source Destination Options
[ ] 1 Accept ping firewall inet log,loglimit="20"
[ ] 2 Accept any lan inet log,loglimit="20"
[ ] 3 NFQueue any inet firewall(any) -
[ ] 4 Accept any inet firewall(any) -
[ ] 5 NFQueue any firewall(any) inet -
[ ] 6 Accept any firewall(any) inet -
[ ] 7 NFQueue any inet firewall -
[ ] 8 Accept any inet firewall -
[ ] 9 NFQueue any firewall inet -
[ ] 10 Accept any firewall inet -
[ ] 11 Accept any any any -
12 [IPS stuff]
[x] 13 NFQueue any any any nfqueuenum="1"
[ ] 14 NFQueue any any any -
[ ] 15 Accept any lan lan log,loglimit="20"
[ ] 16 NFQueue any lan inet nfqueuenum="0"
[ ] 17 NFQueue any lan inet nfqueuenum="1"
[ ] 18 Queue any lan inet log
[ ] 19 Queue any inet firewall log
[ ] 20 Accept any firewall inet -
21 [Firewall outside connectivity]
[x] 22 Accept dns firewall world.inet log,loglimit="20"
[x] 23 Accept http firewall world.inet log,loglimit="20"
[x] 24 Accept https firewall world.inet log,loglimit="20"
[x] 25 Accept ssh firewall world.inet log,loglimit="20"
Status
Ready.
user: victor

Traffic Shaping Rule Example

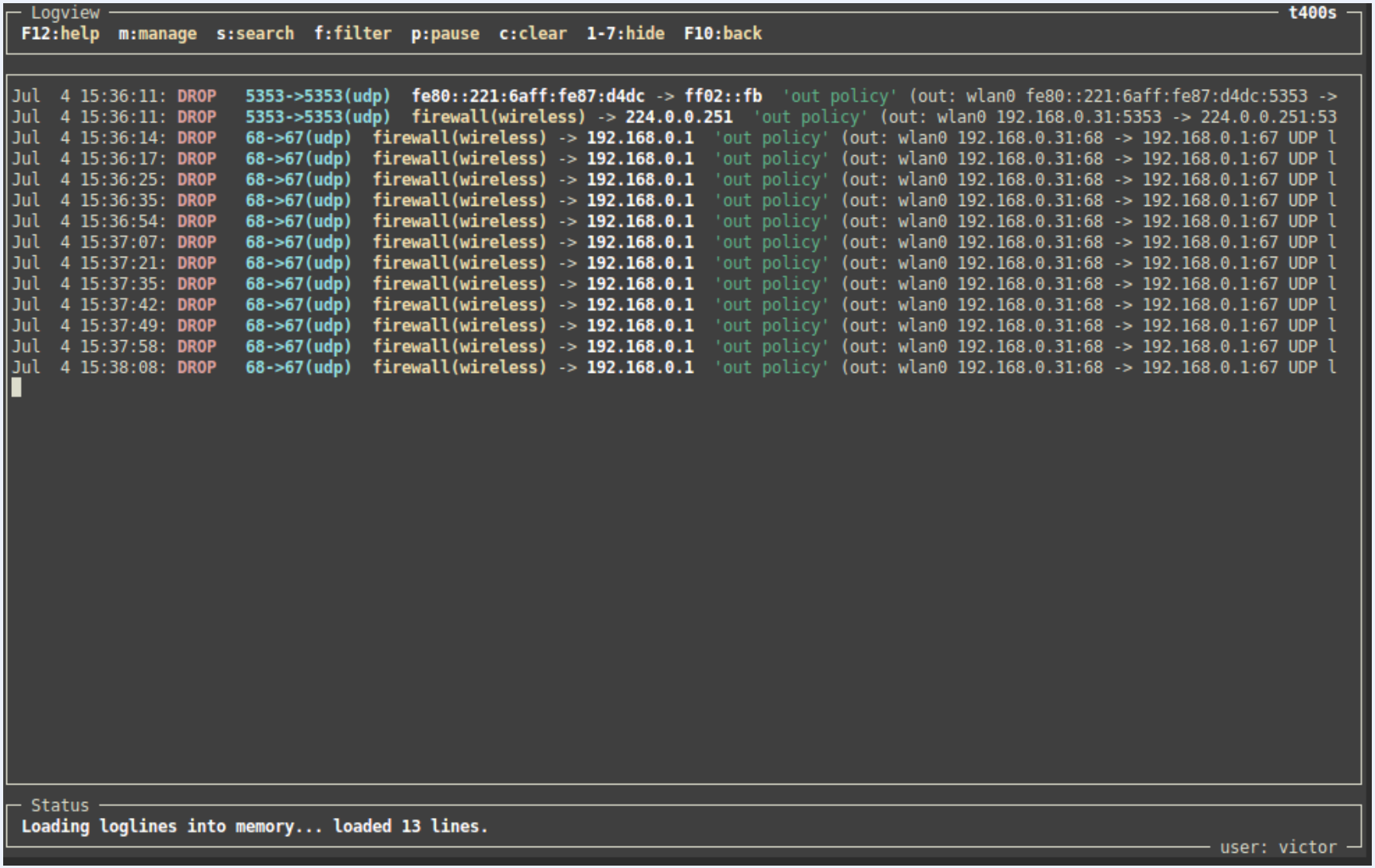
```
accept service any from voip.local.lan to world.inet      \
    options log,loglimit="1",                             \
    in_min="50kbps",out_min="50kbps",prio="1"
```

Vuurmuur

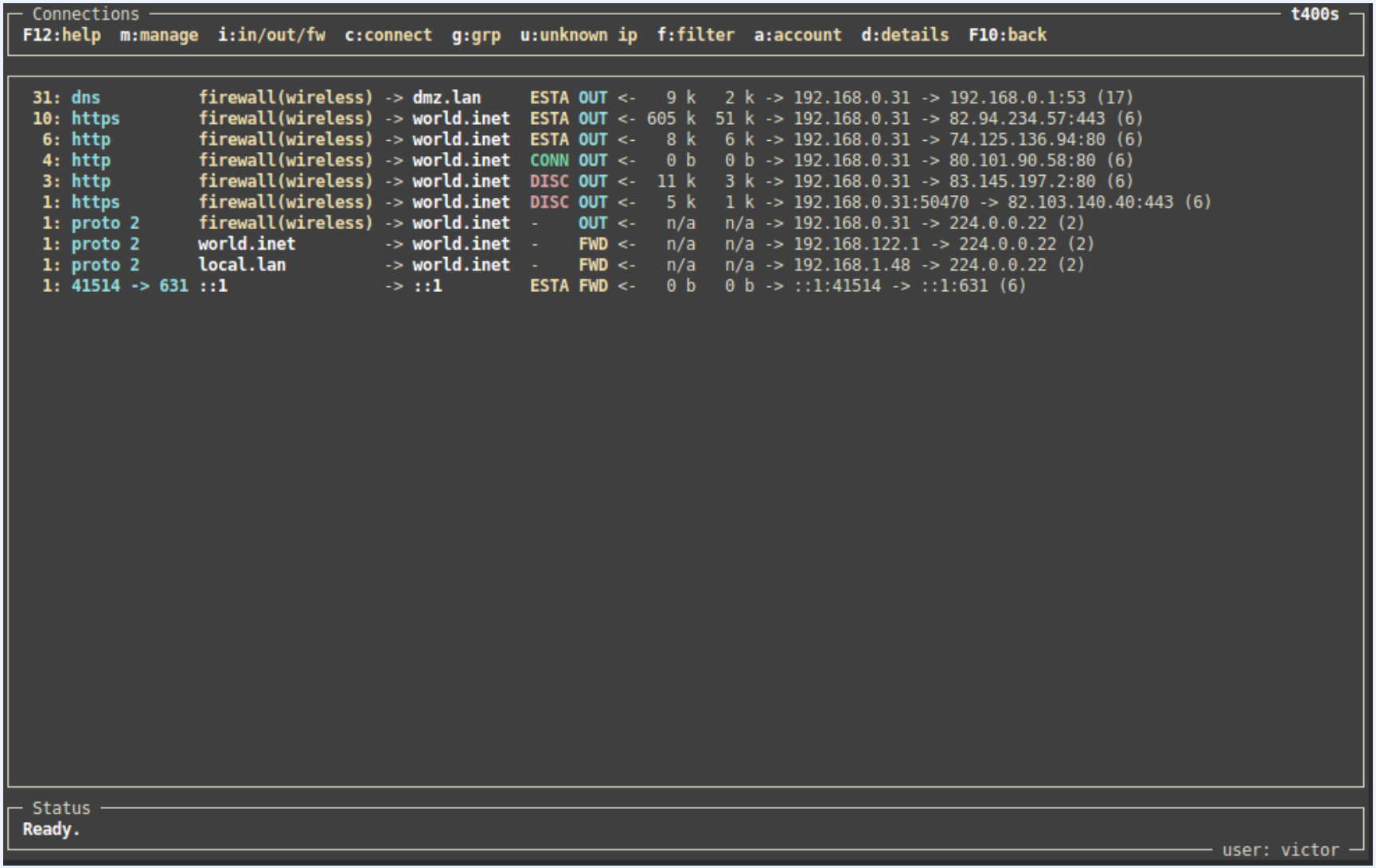
How it works

- Read rules, zones, etc
- Turn into iptables and 'tc' rulesets
- Feeds ruleset to iptables-restore
- Enable/disable ip forwarding if necessary
- Helpful command: vuuurmuur -b (bash out)

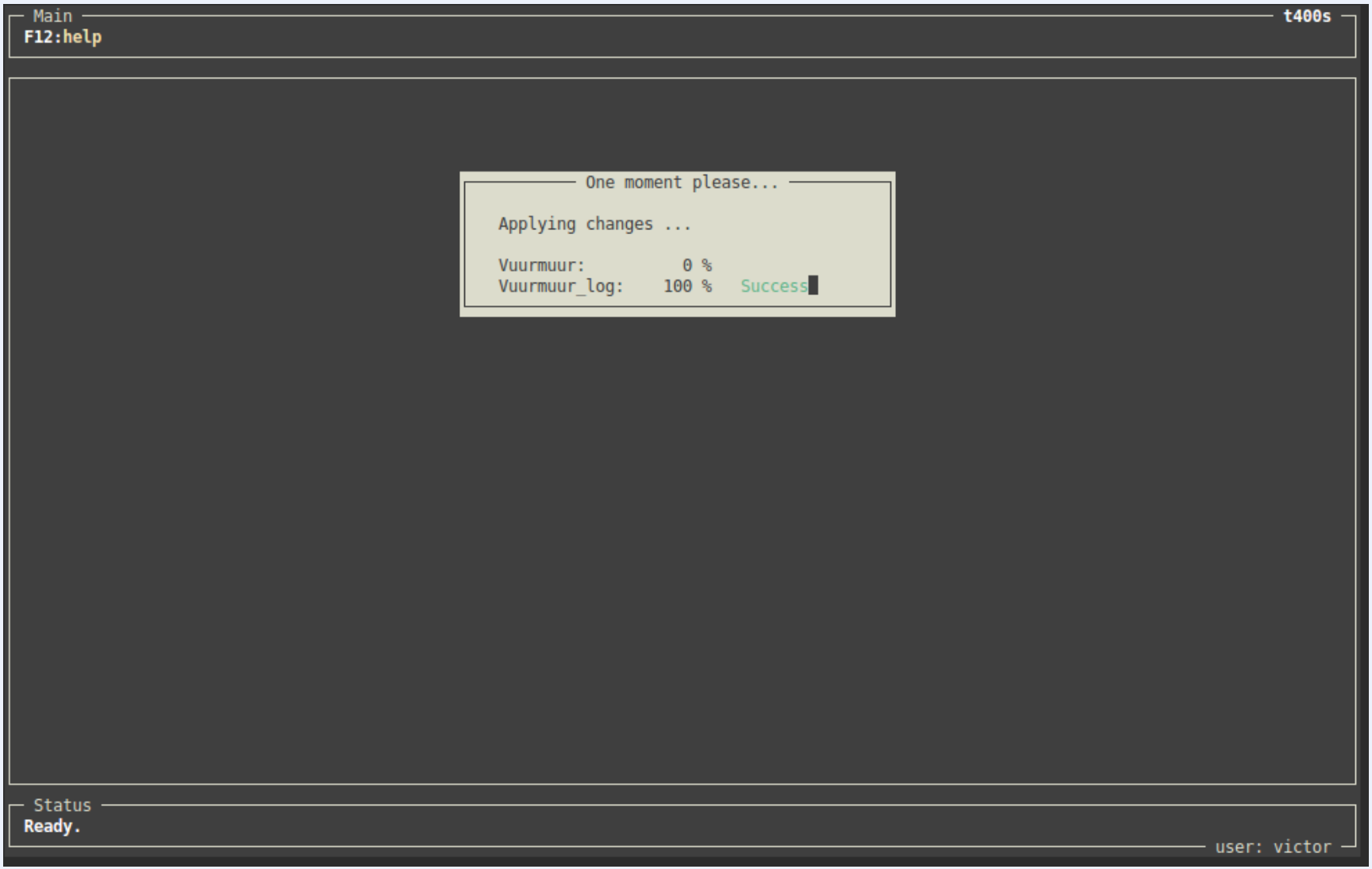
Log Viewer


Logview
t400s
F12:help m:manage s:search f:filter p:pause c:clear 1-7:hide F10:back
Jul 4 15:36:11: DROP 5353->5353(udp) fe80::221:6aff:fe87:d4dc -> ff02::fb 'out policy' (out: wlan0 fe80::221:6aff:fe87:d4dc:5353 ->
Jul 4 15:36:11: DROP 5353->5353(udp) firewall(wireless) -> 224.0.0.251 'out policy' (out: wlan0 192.168.0.31:5353 -> 224.0.0.251:53
Jul 4 15:36:14: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:36:17: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:36:25: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:36:35: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:36:54: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:07: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:21: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:35: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:42: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:49: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:37:58: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Jul 4 15:38:08: DROP 68->67(udp) firewall(wireless) -> 192.168.0.1 'out policy' (out: wlan0 192.168.0.31:68 -> 192.168.0.1:67 UDP l
Status
Loading loglines into memory... loaded 13 lines.
user: victor

Connection Viewer



Applying Changes



Vuurmuur to JSON logging

```
stack=log1:NFLOG,base1:BASE,ifi1:IFINDEX,  \
      ip2str1:IP2STR,mac2str1:HWHDR,json1:JSON
[log1]
group=9
[json1]
sync=1
file="/var/log/ulogd.json"
```

PCAP Logging

```
stack=log2:NFLOG,base1:BASE,pcap1:PCAP
[log2]
group=7
[pcap1]
file="/var/log/vuurmuur.pcap"
sync=1
```

Coming Soon

In Development

- NFLOG / IDS target: support Suricata's NFLOG input (git master)
- Use Ulogd2 to replace vuurmuur_log

Coming soon?

Future Work

- Nftables support
- ipset support
- SYNPROXY
- Real GUI?
- Web GUI?

Finally

Get Involved!

- Open Source: GPLv2+
- http://www.vuurmuur.org/
- #vuurmuur on freenode
- https://github.com/inliniac/vuurmuur