



IPv6 NAT

Ulrich Weber

Reasons for IPv6 NAT

- Security
- Dynamic IPv6 prefixes
- Server Load Balancing, DMZ
- Uplink Balancing (Multi-homing)

IPv6 NAT Status

- OpenBSD 4.9

 - n:1 pass out on em0 from fd00::/64 to any nat-to 2000::1

 - 1:1 pass on em0 from fd00::1 to any binat-to 2000::1

- FreeBSD 8.0

 - IPFW (natd): No

 - IPF (ipnat): No

 - PF: n:1 nat on em0 from fd00::/64 to any -> 2000::1

 - 1:1 binat on em0 from fd00::1 to any -> 2000::1

IPv6 NAT Status

- Cisco 15.0: No
- Juniper Junos 11.2
 - 1:1 translation-type basic-nat66
 - n:1 translation-type napt-66

IPv6 NAT Status

- RAWNAT (Xtables Addons)

```
ip6tables -t raw -I PRE_ROUTING -i ppp0 -d 2000::1 -j RAWDNAT  
--to-destination fd00::2  
ip6tables -t raw -I PRE_ROUTING -o ppp0 -s fd00::2 -j RAWSNAT  
--to-source 2000::1
```

- MAP66 (1:1)

<http://sourceforge.net/projects/map66/>

- NF NAT66 (1:1, n:1)

<http://sourceforge.net/projects/nfnat66/>

IPv6 NAT Status

- Linux Virtual Server

```
ipvsadm -A -t [2000::1]:80 -s rr
```

```
ipvsadm -a -t [2000::1]:80 -r fd00::2 -m
```

```
ipvsadm -a -t [2000::1]:80 -r fd00::3 -m
```

IPv6 NAT Status

- Linux Virtual Server

```
ipvsadm -A -t [2000::1]:80 -s rr  
ipvsadm -a -t [2000::1]:80 -r fd00::2 -m  
ipvsadm -a -t [2000::1]:80 -r fd00::3 -m
```

- sysctl -w net.ipv4.vs.contrack=1

```
ipv6 10 tcp 6 431990 ESTABLISHED  
src=3000::5 dst=2000::1 sport=49221 dport=80  
src=fd00::3 dst=3000::5 sport=80 dport=49221  
[ASSURED] mark=0 zone=0 use=2
```

NAT66 - RFC 6296

- IPv6-to-IPv6 Network Prefix Translation
- June 2011

- No port translation
- Checksum-Neutral mapping

- No modification of upper layers,
but what about ICMPv6 error messages, e.g. „Packet Too Big“

IPv6 NAT - Integration into netfilter

- No IPv6 NAT
- NAT66 IPTables target (RFC 6296)
 - with/without conntrack dependency ?
- Make nf_nat protocol independent and move to net/netfilter
 - let admins decide if they want 1:1 or n:1
- Any other solutions?