SFC

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1 Changes

There is no significant update in SFC side. We only have three changes:

  a. A new Cisco catalyst 2960 installation in SFC's NOC.

  b. A new NAT64 server based on OpenBSD-5.4-CURRENT.

  c. Routing daemon updates to Quagga-0.99.22.4 in nara-gate router.

Because only a new NAT64 server has big significance in our operation, we will discuss in next paragraphs.

Due to un-stable of old sfc-nat64.ai3.net operation which uses naptd, we decided to change nat64 implementation from natptd to OpenBSD's nat64 implementation. We use OpenBSD because it is in kernel level natively support and simple configuration of translator in OpenBSD's packet filter (pf). We also prepare backup nat64 server using Linux which uses jool kernel module from `https://github.com/NICMx/NAT64` in case we have trouble with OpenBSD in the future.

Figure 1 shows how the host which has IPv6 global address and private IPv4 address can access IPv4 Internet via sfc-nat6. If host wants to access IPv4 website, totd daemon in server will help to translate IPv4 address of destination into IPv6 address. Since totd only translates IPv4 address to IPv6 address, we still need Bind for naming/DNS resolution. In this case totd listen in port 53 and Bind will listen on port 5353. AI3 uses 2001:d30:101:624::/96 IPv6 address pool for translation purpose. Since we added IPv6 static routing in sfc-gate2, that every 2001:d30:101:624::/96 prefix must go trough sfc-nat64, the request from server will be forwarded to sfc-nat64 server. sfc-nat64 server translates IPv6 address destination to IPv4 address which is last 4 bit in our 2001:d30:101:624::/96 prefix.

An example of session that recorded in sfc-nat64.ai3.net is shown as follows:

```
# pfctl -ss
all tcp 202.249.25.29:58370 (2001:d30:112:0:2c11:f6b3:a918:6ba[37456]) ->
   69.171.235.16:443 (2001:d30:101:624::45ab:eb10[443]) ESTABLISHED:ESTABLISHED
```
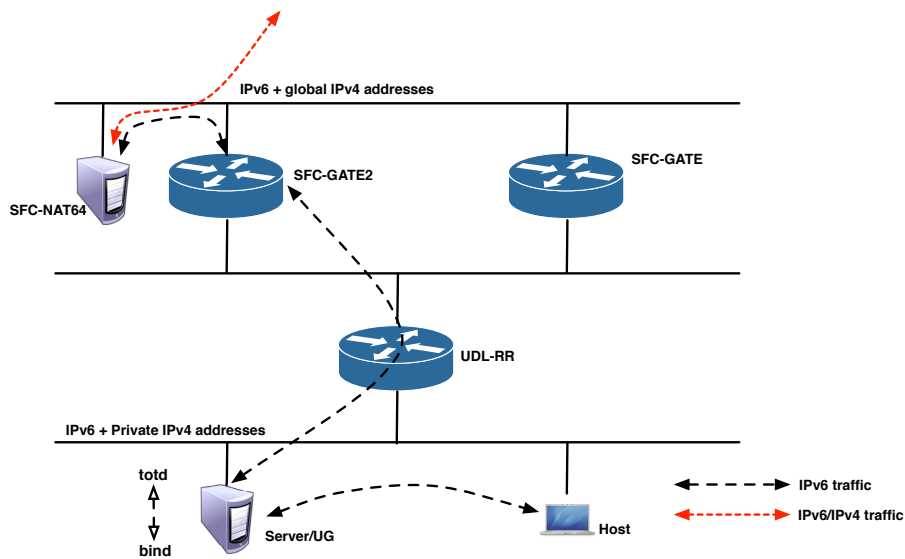
Figure 1: Accessing IPv4 Internet via SFC-NAT64

```
all tcp 202.249.25.29:56196 (2001:d30:112:0:2c11:f6b3:a918:6ba[37457]) ->
   69.171.235.16:443 (2001:d30:101:624::45ab:eb10[443]) FIN_WAIT_2:FIN_WAIT_2
```

Above session tell us that a client which has IPv6 address 2001:d30:112:0:2c11:f6b3:a918:6ba want to access IPv4 web page with IPv4 address 69.171.235.16 and port 443 (HTTP SSL). IPv6 address that used for translation is 2001:d30:101:624::45ab:eb10.