

Stateless Deterministic NAT (SD-NAT)

draft-penno-softwire-sdnat-01

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Motivation

Issues with current Stateless solutions:

- Those mapping approach requires an **IPv6 access network** and an IPv6 capable CPE.
- Tying IPv6 and IPv4 address reduce flexibility in managing IPv4 pool: add/deletion of IPv4 resources require IPv6 renumbering.
- Require an **important CPE modification**. Recent History has shown that it is the most difficult part.

Time Crunch

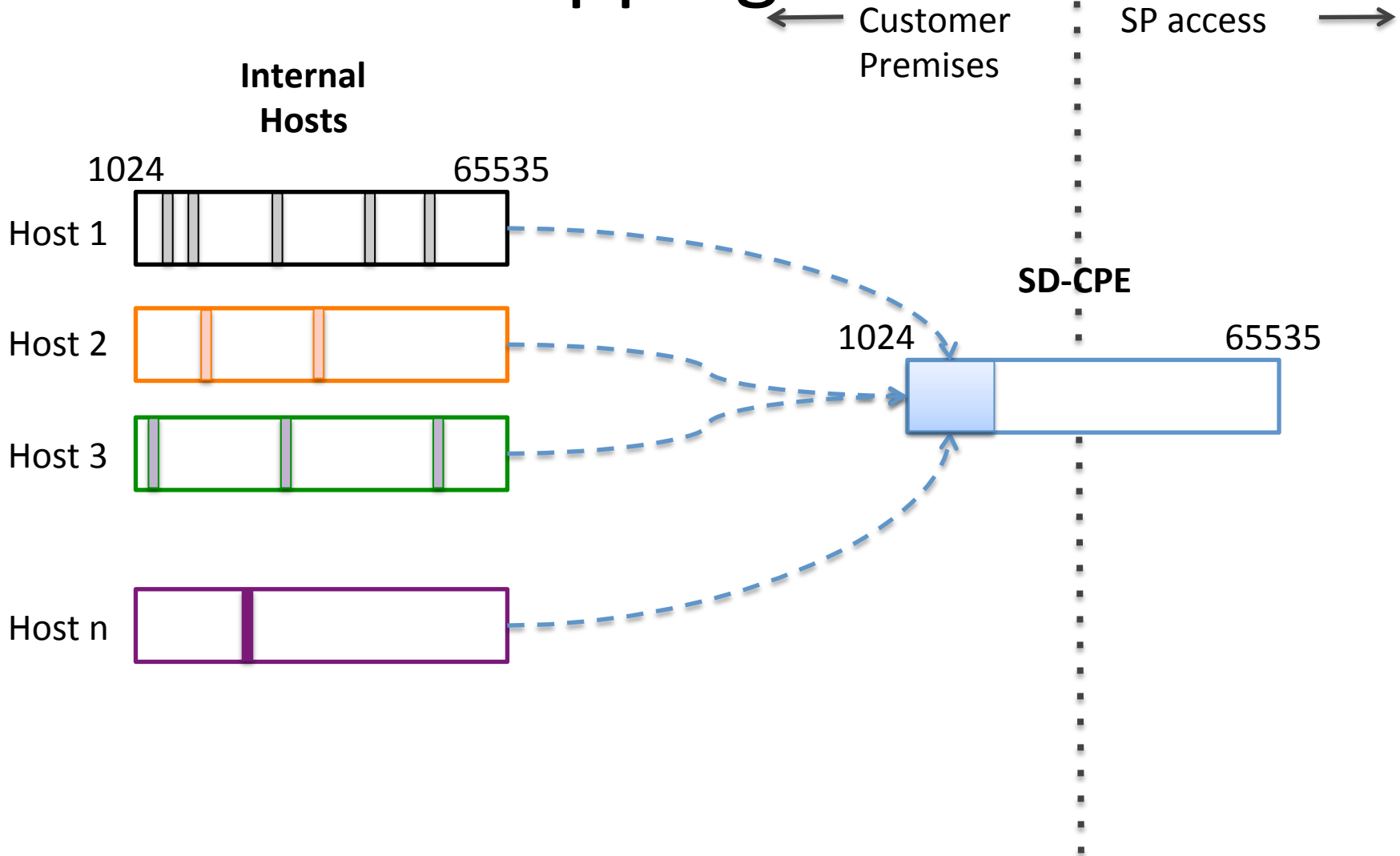
Time is the enemy of Stateless solutions:

- Once CGNs are deployed, no reason to move away from them (CPE investment, Ipv6 access)
- Ratio Users/IP increasing, Stateless will become less attractive

CGN Smooth upgrade to SD-NAT:

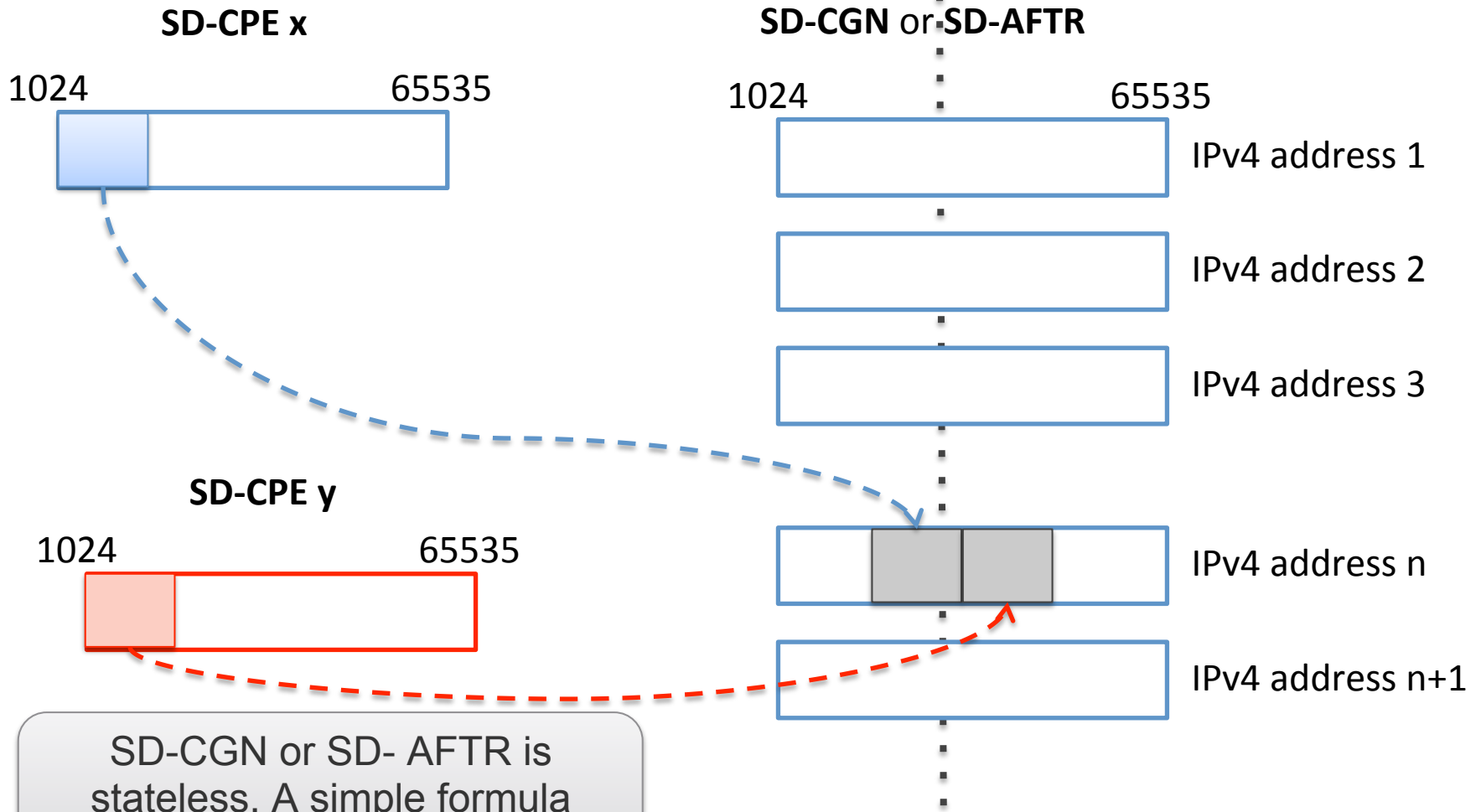
- No CPE upgrade
- No Ipv6/Re-addressing needed
- Easy Mixed of CGN/SD-NAT

Port mapping on SD-CPE



Port mapping on SD-CGN or SD-AFTR

← SP access SP core →



SD-CGN or SD- AFTR is stateless. A simple formula maps inside and outside ports.

CPE Modification

Example on Linux based CPE (DD-WRT, ...)

`/lib/firewall/uci_firewall.sh`

OLD:

```
$IPTABLES -I zone_${zone}_nat 1 -t nat -o "$ifname" -j MASQUERADE
```

NEW:

```
$IPTABLES -I zone_${zone}_nat 1 -t nat -o "$ifname" -j MASQUERADE -p tcp --  
to-ports 1024-2023
```

SD-NAT in a nutshell

- **Stateless operation on CGN**
 - No Logs, No State, Easy Redundancy, Low delay
- **Minimal CPE modification**
 - CPE chooses outgoing SRC ports to fit into a well-known range [1024-MaxPort]
 - CPE can be configured with MaxPort (eg TR69)
 - Alternatively, the CPE can dynamically discover MaxPort.
 - That's it! No IPv6 requirements, no complex IPv4/IPv6 mapping.
- **Flexibility**
 - Easily add/remove IPv4 global addresses from NAT pool without renumbering the access network.
 - Access Network can be IPv4.
 - Can work with an IPv6 access network (Very similar to DS-Lite).

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Thank you

Questions?