# On demand IPv4 address provisioning in Dual-Stack

# PPP deployment scenarios.

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Life's for Sharing

# On demand IPv4 address provisioning in Dual-Stack PPP deployment scenarios - draft-fleischhauer-ipv4-addr-saving.
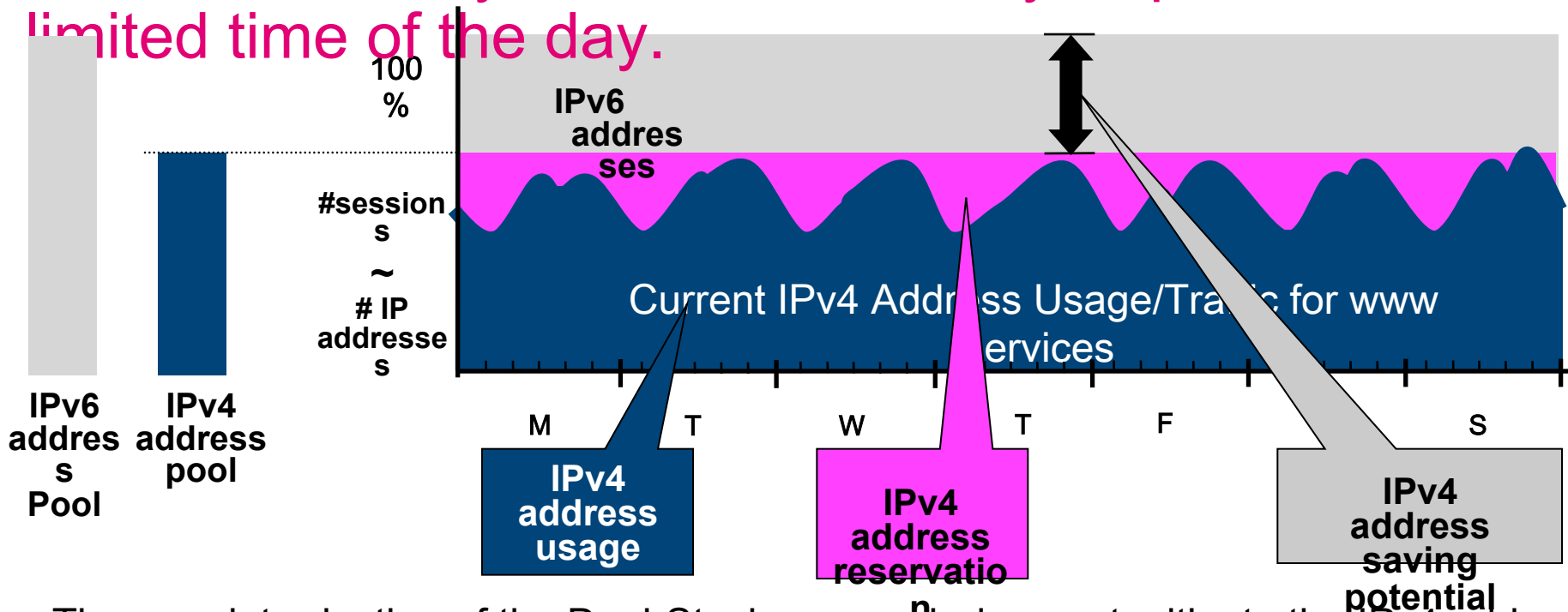# Content.

- Motivation

- Presumptions

- Message Flow
  - assigning IPv4 address parameter
  - releasing IPv4 address parameter

- Next steps

# Motivation I/II.
## With IPv6 usage for always-on NGN services (Voice) - IPv4 connectivity is furthermore only required for a limited time of the day.



- The pure introduction of the Dual-Stack approach does not mitigate the IPv4 address scarcity.

- Due shifting IP traffic to IPv6 the IPv4 traffic demand will be decreased. IPv4 connectivity is just
  temporally necessary. A mechanism which provide an IPv4 address on demand is needed.

- This mechanism is already part of the BBF standardization (WT-242 IPv6 Transition Mechanisms for
  Broadband Networks).

# Motivation II/II.
# Avoiding additional load on AAA and providing an IPv4 exit strategy.

avoiding scalability issues on HG and NAS

simplify (traffic class based) traffic control

**Why not using 2 PPP-Sessions – one for IPv4 and one for IPv6?**
**Why not using LGN etc.?**

- an additional HG ⇔ NAS-Session (multiple user credentials etc.)

- LGN as last resort solution (complexity, costs etc.) may not become necessary when deploying on-demand IPv4 address provisioning

- simplify (traffic class based) traffic control estimated costs in aggregation networks equal to IPv6 introduction

- will impact the customer experience

**Why not using LGN etc.?**
- does not provide an IPv4 exit strategy

- LGN as last resort solution (complexity, costs etc.) may not become necessary when deploying on-demand IPv4 address provisioning

- estimated costs in aggregation networks equal to IPv6 introduction

- will impact the customer experience

- does not provide an IPv4 exit strategy

# Presumptions.

other) services must be provided on IPv6.

## Home Gateway – Customer Devices

- Dual-Stack capabilities on network and application layer
- Traffic and/or timer triggered detection of IPv4 communication
  demand => assigning / releasing of IPv4 parameters via IPCP

## Network/Services

- Dual-Stack capabilities on network and application layer

## Home Gateway – Customer Devices

- 
  Dual-Stack PPP session (local on NAS or RADIUS/
  Dual-Stack capabilities on network and application layer
  DIAMETER based)

Traffic and/or timer triggered detection of IPv4
communication assigning / releasing of IPv4 parameters via
demand =>
IPCP

- Dual-Stack capabilities on network and application layer

The message flow contain 4 blocks.
Assigning and Releasing of the IPv4 address can occur within the PPP session several times in succession

**1.PPP/LCP/IPv6CP setup**                                                                    **t**
  ⇨ IPv6-only connectivity

. . .

**2.Assigning IPv4 address parameter (IPCP configuration)**
  ⇨ Dual-Stack connectivity

**1.PPP/LCP/IPv6CP setup**

  ⇨

. . IPv6-only connectivity

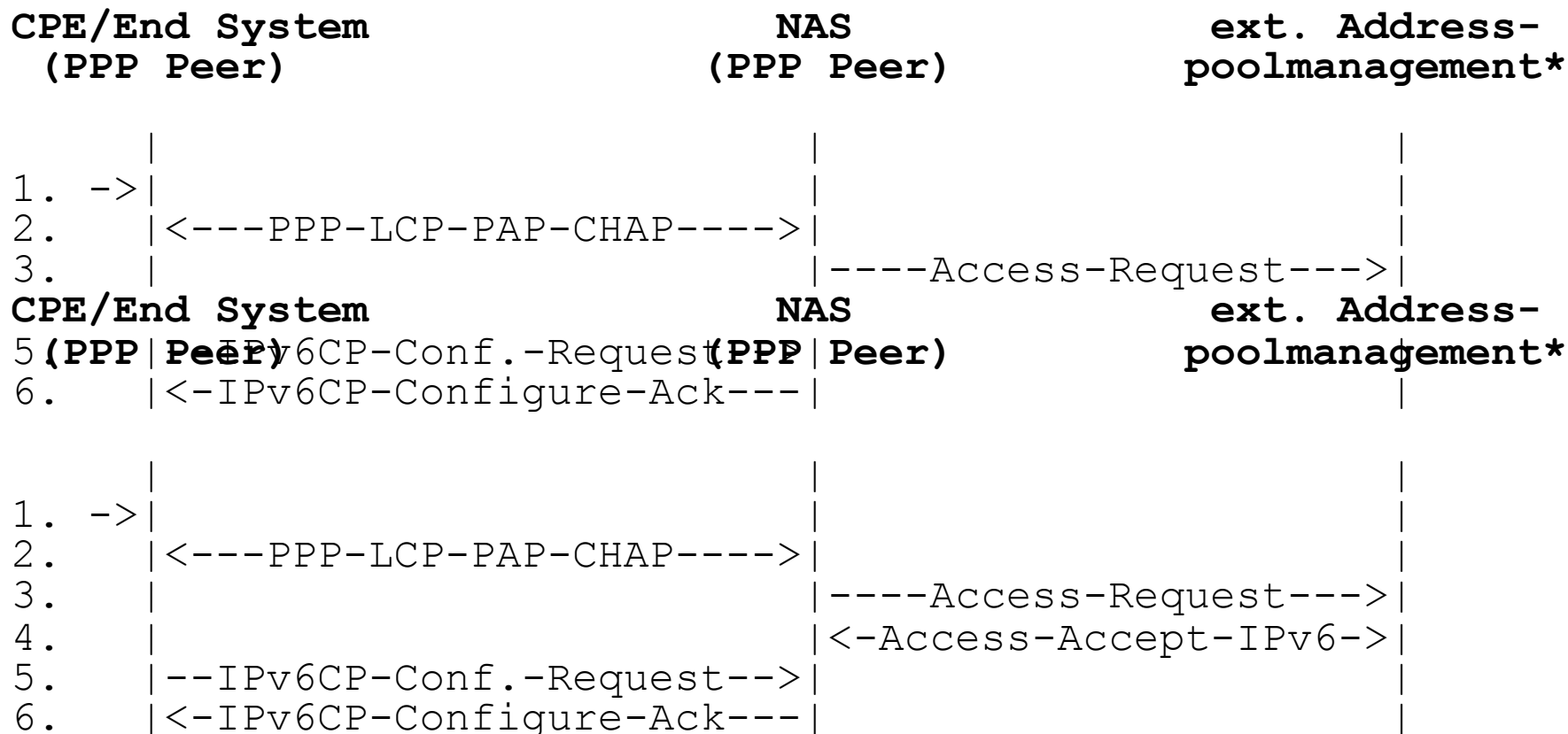**2.Assigning IPv4 address parameter (IPCP configuration)**

Dual-Stack connectivity

# PPP and IPv6CP Session Setup.
# Initial the customer will be provided with IPv6-only connectivity.

```
CPE/End System                        NAS              ext. Address-
  (PPP Peer)                      (PPP Peer)          poolmanagement*

       |                              |                        |
1. ->|                              |                        |
2.     |<---PPP-LCP-PAP-CHAP---->|                        |
3.     |                              |----Access-Request--->|
CPE/End System                        NAS              ext. Address-
5 (PPP|Peer)v6CP-Conf.-Request(PPP|Peer)        poolmanagement*
6.     |<-IPv6CP-Configure-Ack---|                        |

       |                              |                        |
1. ->|                              |                        |
2.     |<---PPP-LCP-PAP-CHAP---->|                        |
3.     |                              |----Access-Request--->|
4.     |                              |<-Access-Accept-IPv6->|
5.     |--IPv6CP-Conf.-Request-->|                        |
6.     |<-IPv6CP-Configure-Ack---|                        |
```
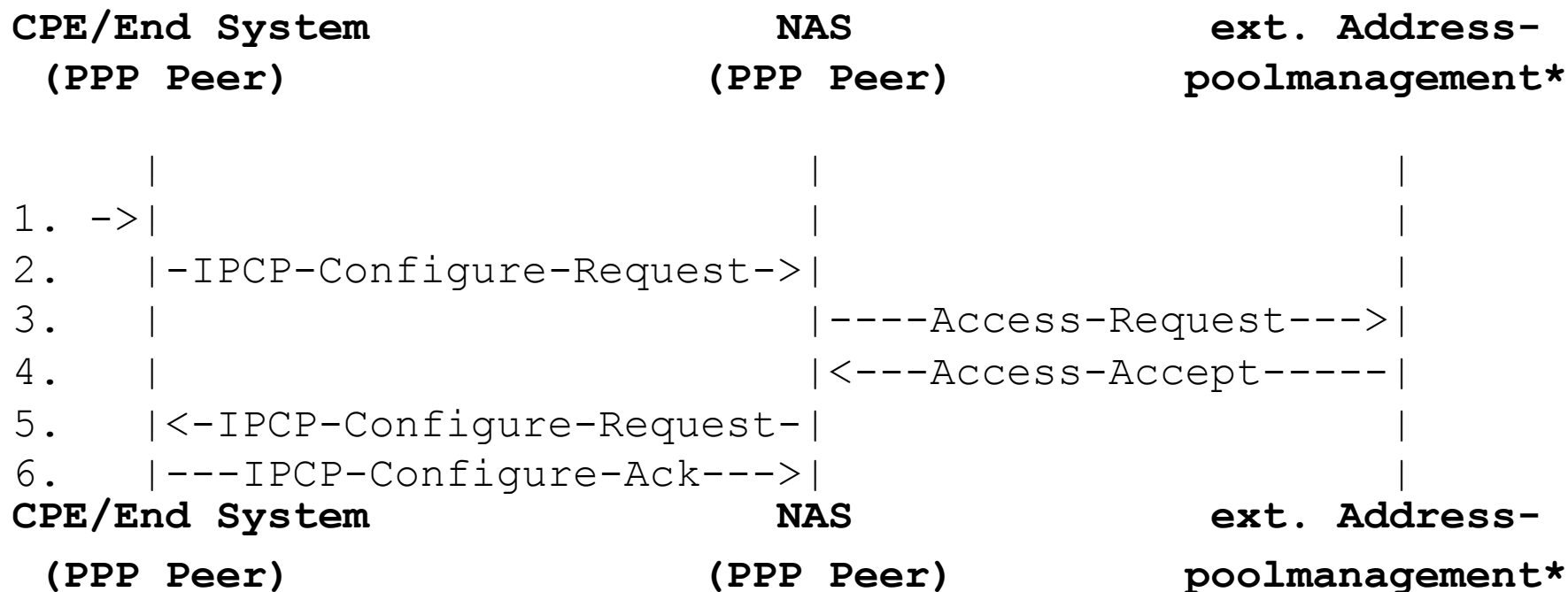
*) The mechanism will also work when the management of the address pool is done on the NAS.

# Assigning IPv4 address parameter.
# As soon IPv4 traffic demand is detected an IPv4 address will be assigned.

```
CPE/End System                    NAS               ext. Address-
  (PPP Peer)                   (PPP Peer)           poolmanagement*


      |                            |                     |
1. ->|                            |                     |
2.    |-IPCP-Configure-Request->|                     |
3.    |                            |----Access-Request--->|
4.    |                            |<---Access-Accept-----|
5.    |<-IPCP-Configure-Request-|                     |
6.    |---IPCP-Configure-Ack--->|                     |
CPE/End System                    NAS               ext. Address-
  (PPP Peer)                   (PPP Peer)           poolmanagement*


1. ->|                            |                     |
```
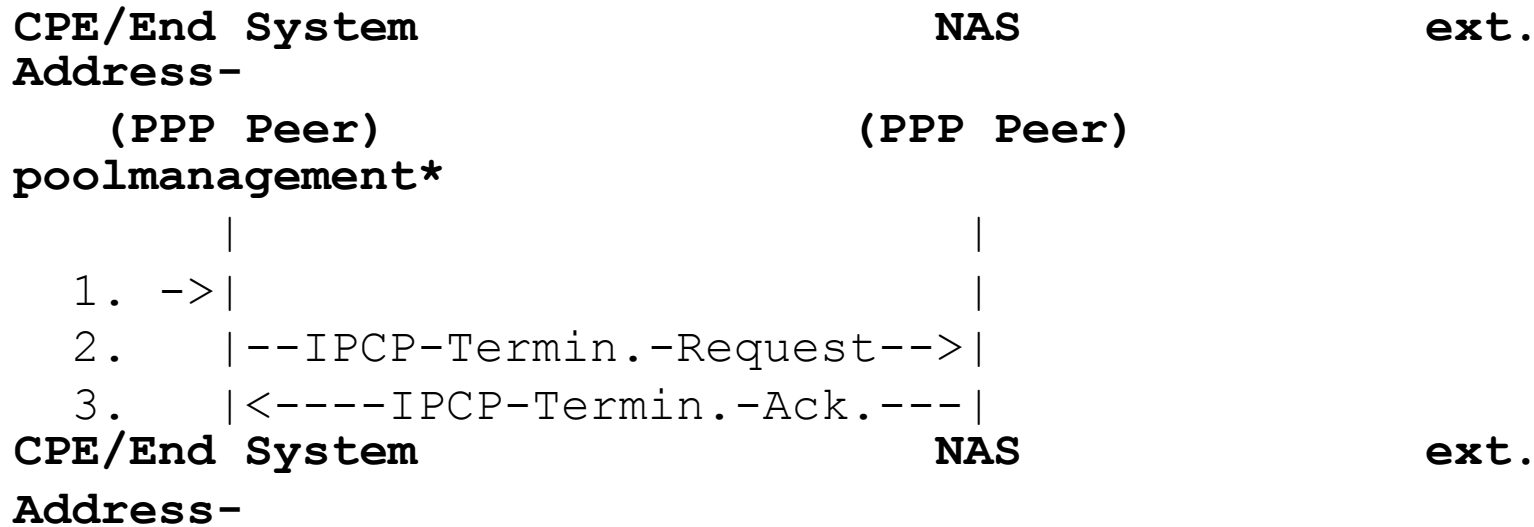
*) The mechanism will also work when the management of the address pool is done on the NAS.

# Releasing IPv4 address parameter
# When no IPv4 communication exist the IPv4 address can be released.

```
CPE/End System                          NAS                     ext.
Address-
   (PPP Peer)                        (PPP Peer)
poolmanagement*
          |                             |                              |
  1. ->|                                |                              |
  2.    |--IPCP-Termin.-Request-->|                              |
  3.    |<----IPCP-Termin.-Ack.---|                              |
CPE/End System                          NAS                     ext.
Address-
```

*) The mechanism will also work when the management of the address pool is done on the NAS.

# Next Steps.

## Until IETF81:

- Feedback highly welcome!
- Introducing Message Flow in I-D 01 under consideration of WG feedback.

## Is this a working topic for the Intarea WG?
## If "Yes" => Adopt the I-D as WG topic?

. . .

# Thanks for your attention!

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