

IETF 117 – 6lo

Generic Address Assignment Option for 6LowPAN

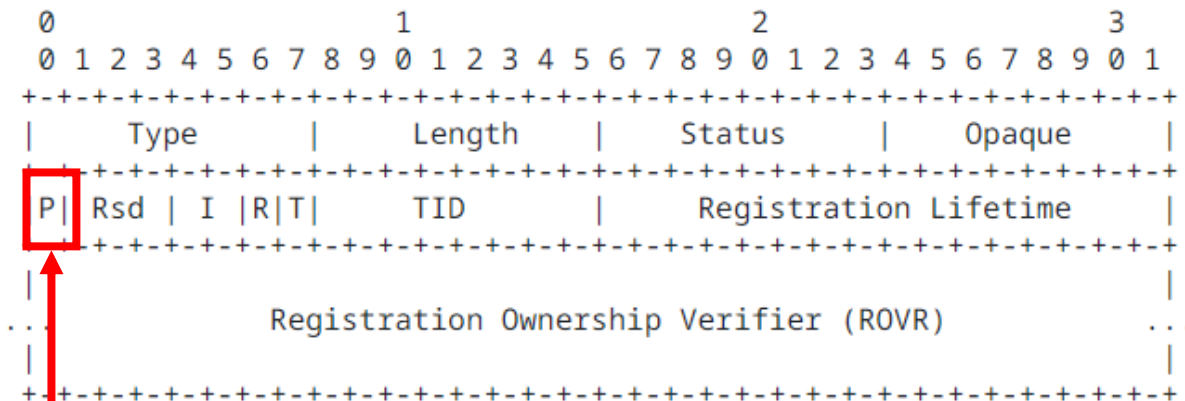
Neighbor Discovery

draft-iannone-6lo-nd-gaao-00

L. Iannone, D. Lou,

IETF 117 – San Francisco

Motivation



- draft-ietf-6lo-path-aware-semantic-addressing-02 still needs a flag in the EARO
- To request an address an address must be registered !!!
- PASA-specific solution

• At PASA node Bootstrap:

1. Node sends Multicast Router Solicitation
2. Node selects as parent one of the nodes responding with a Router Advertisement
 - FCFS may be sufficient...
3. Node sends Neighbor Solicitation with EARO option to register Link-Local Address
 - P-bit set to indicate it is requesting a PASA address as well
4. Selected Parent to send back Neighbor Advertisement with EARO option
 - Status=0 success
 - P-bit returned unchanged
 - PASA address appended to returning the EARO option
5. Finalizing: child MUST register PASA address (without using P-bit)
 - Necessary to be inline with Sec. 5.6 RFC 8505
 - Also signaling that child node accepted the address

Requesting and Assigning Addresses/Prefixes



Requesting and Assigning Addresses/Prefixes



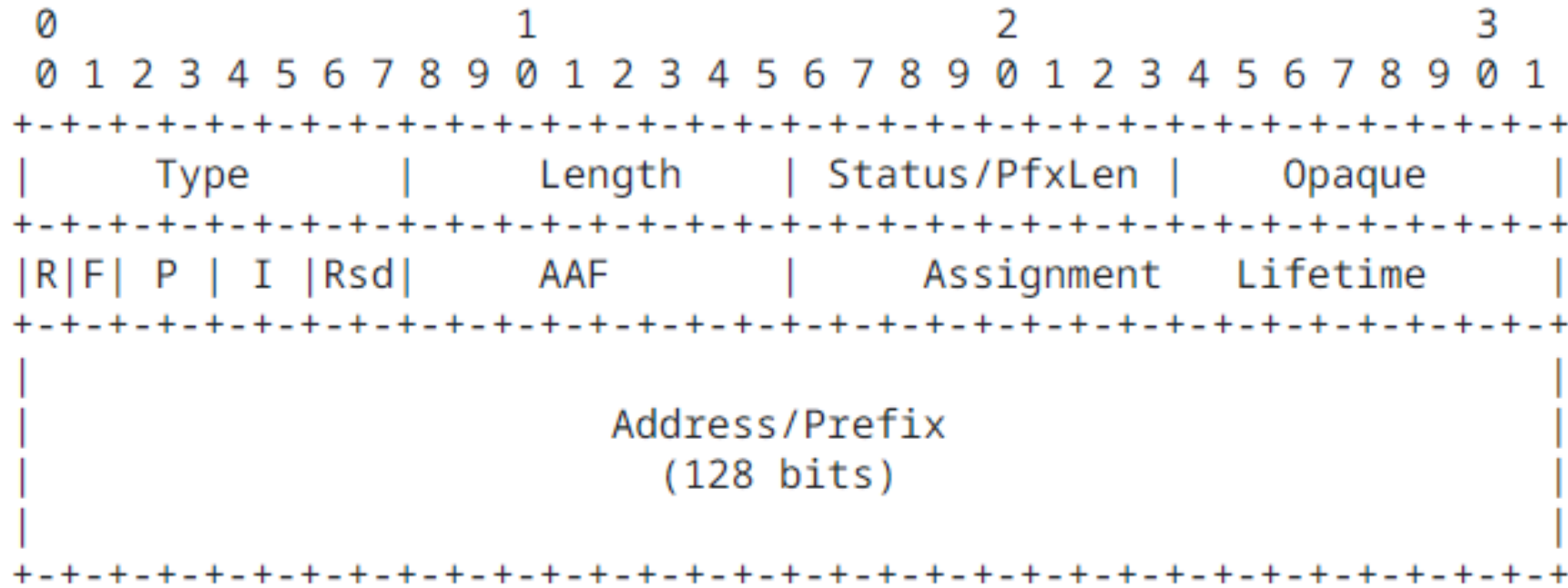
- Can be done with EARO by registering the address

Requesting and Assigning Addresses/Prefixes

- Can be done by new option enabling explicit requests
 - not embedded in EARO

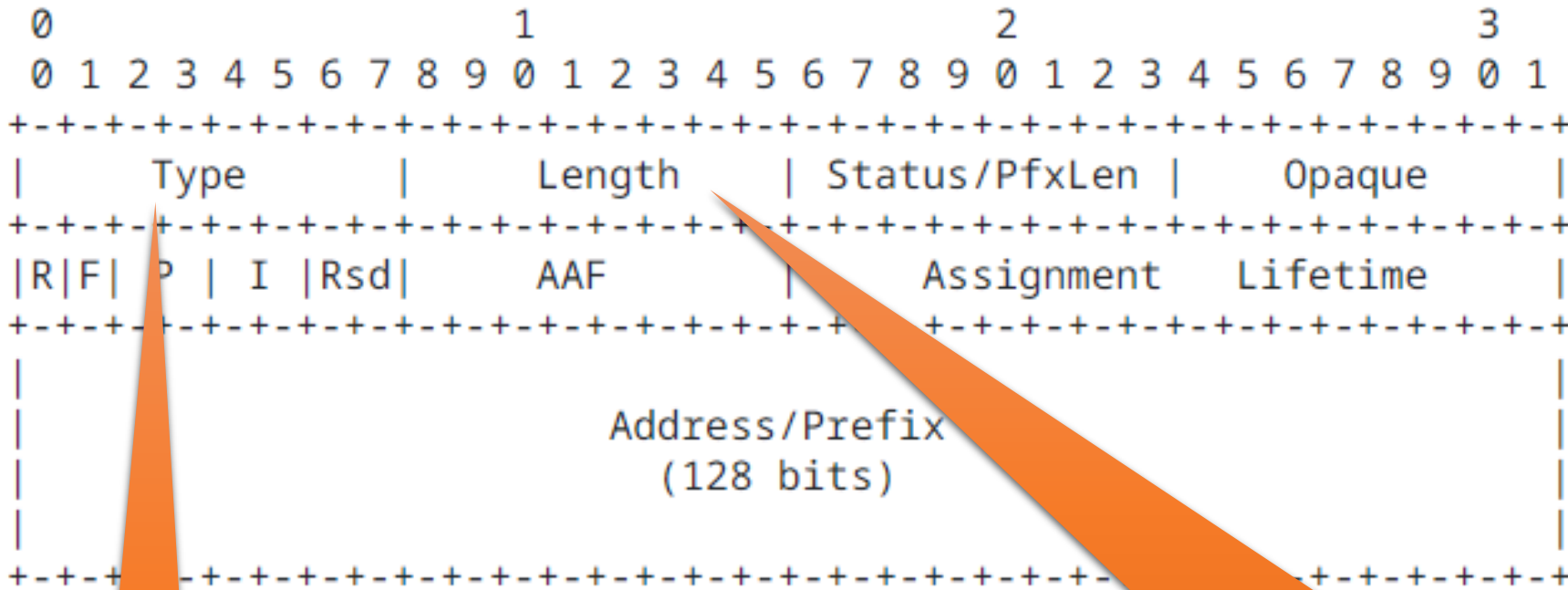


Extended Address Registration Option (GAAO)



- Format similar to EARO with some field having the same purpose so to be used through the 4-steps procedure
- Future revision may include ROVR field

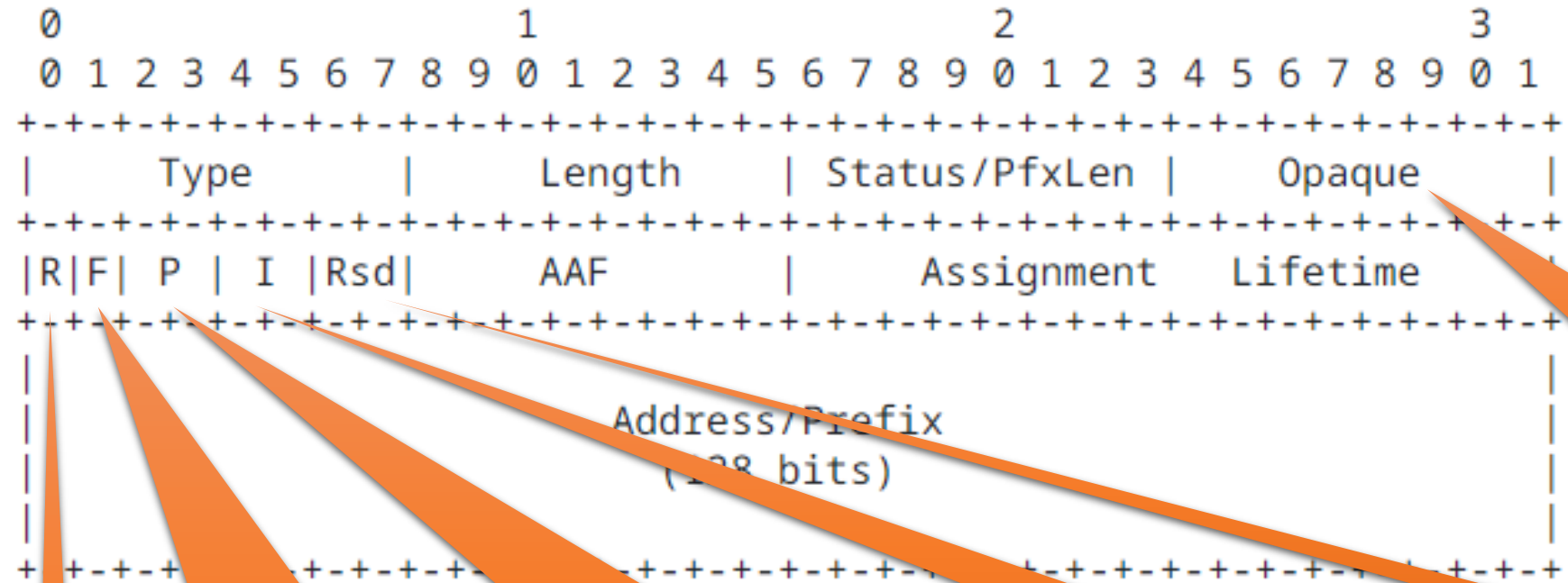
Extended Address Registration Option (GAAO)



Type: 42 (suggested)

- Length:
- 1 on requests
 - 3 on replies with appended address/prefix

Extended Address Registration Option (GAAO)



Opaque: as defined in RFC8505

Reserved

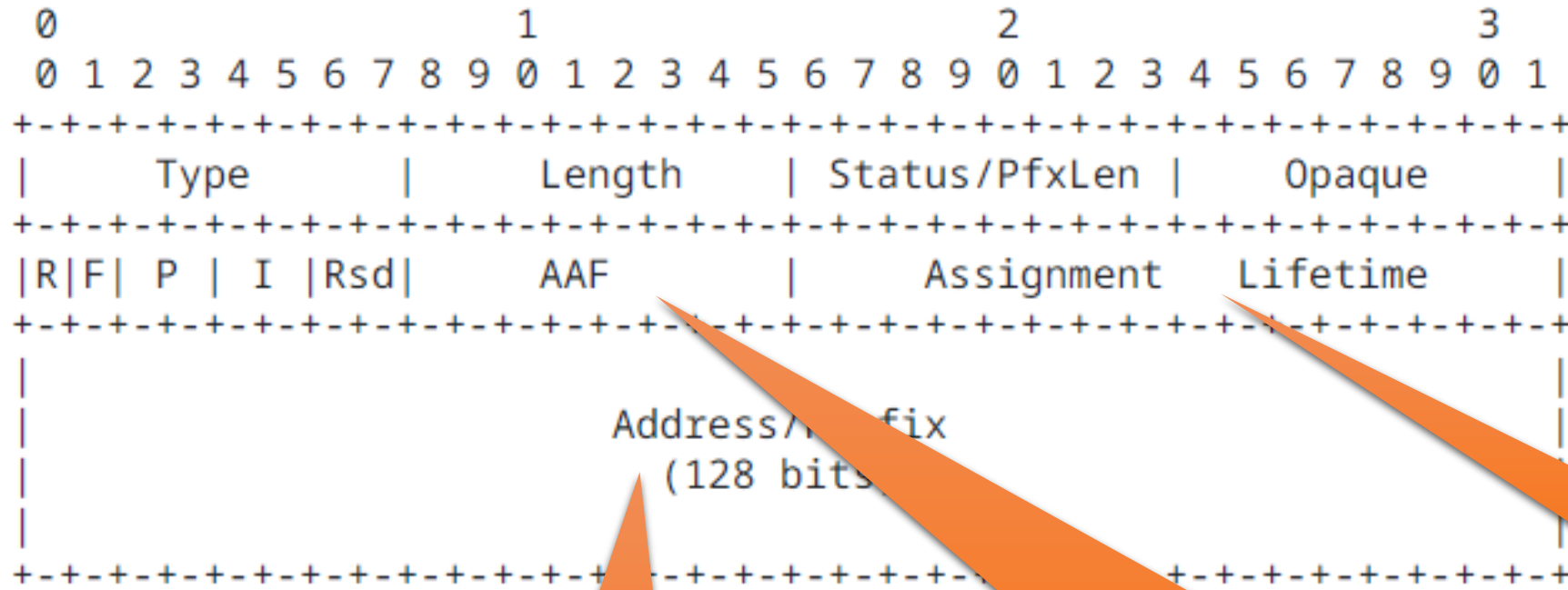
I-field: as defined in RFC8505

P-field as defined in [I-D.thubert-6lo-prefix-registration]

F-bit as defined in [I-D.thubert-6lo-prefix-registration]

Reserved

Extended Address Registration Option (GAAO)



Assignment lifetime:

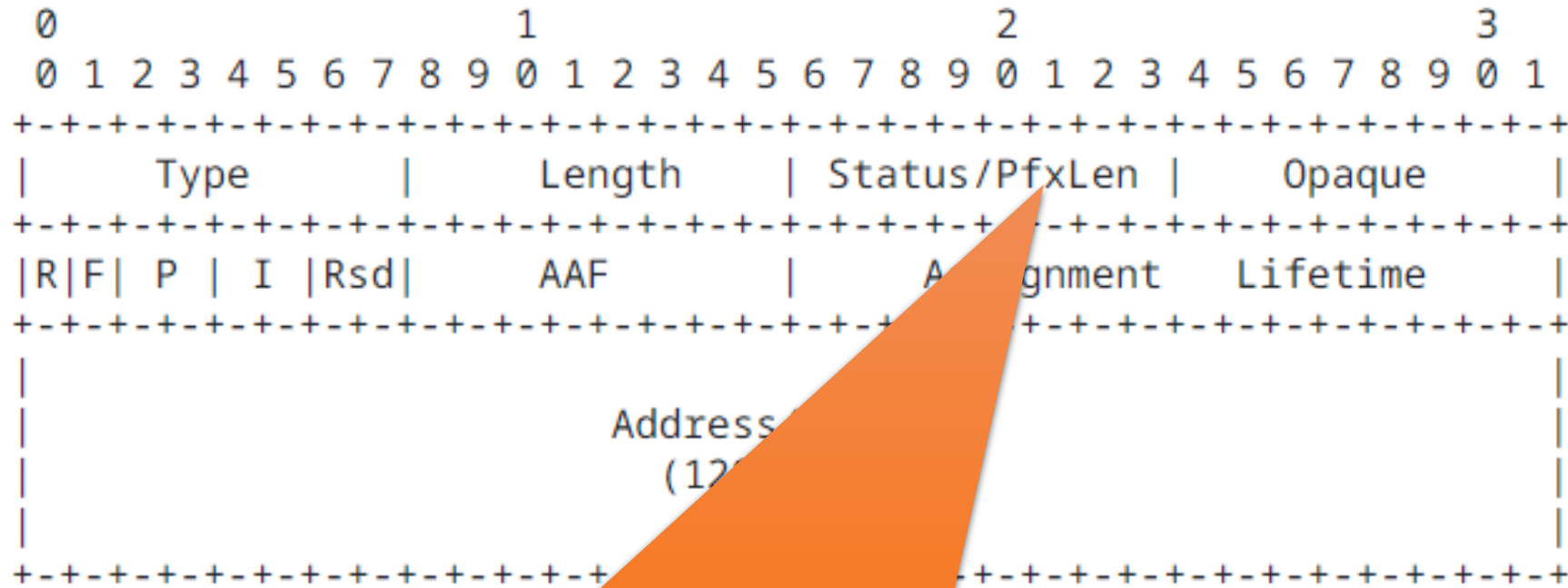
- In NS indicates minimum requested lifetime
- In NA indicates maximum lifetime

- Address Allocation Function: algorithm used to assign the address
 - PASA would set this to 1, but other AAF will use different values

Address/Prefix:

- 128-bits returned address or prefix
- only present in NA messages

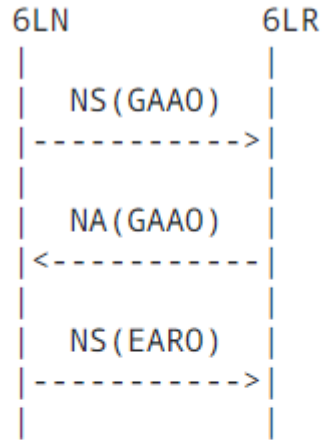
Extended Address Registration Option (GAAO)



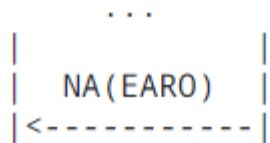
Status/Pfxlen: In NA this indicates either an error or the prefix length of the returned address/prefix

- If length == 1 => no address appended => the field indicates an error code [RFC8505]
- If length == 3 => address appended => the field indicates the prefix length
- Field set to 0 in NS messages

Requesting and Confirming an Address Assignment



...
Procedure According to [RFC8505](#),
[I-D.ietf-6lo-multicast-registration](#), or
[I-D.thubert-6lo-prefix-registration](#)
depending on the type of address.

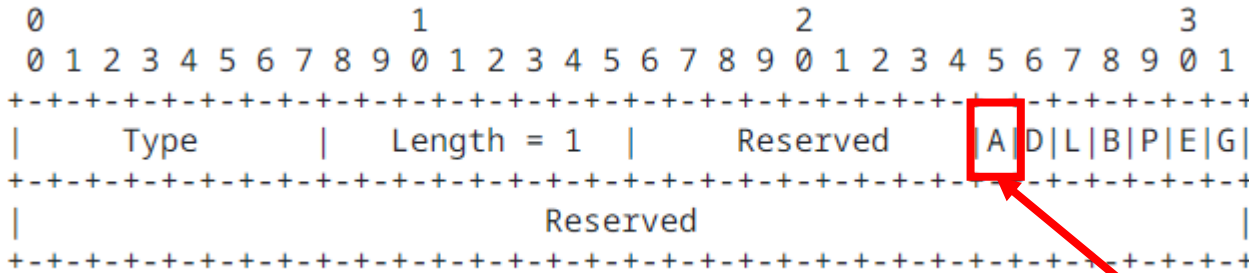


- At PASA node Bootstrap:

1. Node sends Multicast Router Solicitation
2. Node selects as parent one of the nodes responding with a Router Advertisement
 - FCFS may be sufficient...
3. Node sends Neighbor Solicitation with GAAO option
4. Selected Parent to send back Neighbor Advertisement with GAAO option
5. Address confirmed using existing EARO procedures (according to type of address requested)

- Address request can be done at any time (not only at boot strap)

Signaling GAAO Capability



- Using existing machinery..
- 6LowPAN Capability Indication Option (6CIO)
- Use new bit to indicate if the node supports GAAO
 - Yes... it is the same bit proposed by PASA
 - But if we use GAAO:
 - PASA does not need to redefine the same bit
 - PASA does not need to modify EARO
 - We do not need to update RFC 8505 (PASA will just use GAAO)
- The advantage of GAAO is that is more generic (PASA being just one possible use case)

Next Steps

- **Generic solution to request an address assignment**
- **Worth refining the idea ?**
- **Any feedback welcome 😊**

THANKS!