IPv6 Neighbor Discovery Prefix Registration

draft-ietf-6lo-prefix-registration

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6LoWPAN ND (IPv6 Stateful Address Autoconfiguration)

RFC 6775 (original 6LoWPAN ND)

- Defines ARO for registration and DAD operations for stateful AAC

RFC 8505 (Issued 11/2018)

- The protocol agnostic registration for ULA/GUA for proxy ND and routing services
- Analogous to a Wi-Fi association but at Layer 3: a deterministic and query-able state for all addresses

RFC 8929 (Issued 11/2020)

- Federates 6lo meshes over a high-speed backbone
- ND proxy analogous to Wi-Fi bridging but at Layer 3

RFC 8928 (Issued 11/2020)

- Protects addresses against theft (Crypto ID in registration)

draft-ietf-6lo-multicast-registration

- Extends RFC 8505 for multicast and anycast

draft-thubert-6lo-unicast-lookup

- Provides a 6LBR on the backbone to speed up DAD and lookup
- Coexistence with classical ND

draft-ietf-6lo-prefix-registration

- Extends RFC 8505 for prefixes

Let it be for prefixes!

- Hosts may own prefixes -> and routers may connect to prefixes
  - Network in Node / recursive networking
  - Kubernetes / Private IPv4 realms
  - Directly connected (no routing)

Registering a Prefix

SGP – agnostic UNI interface between prefix owner and router

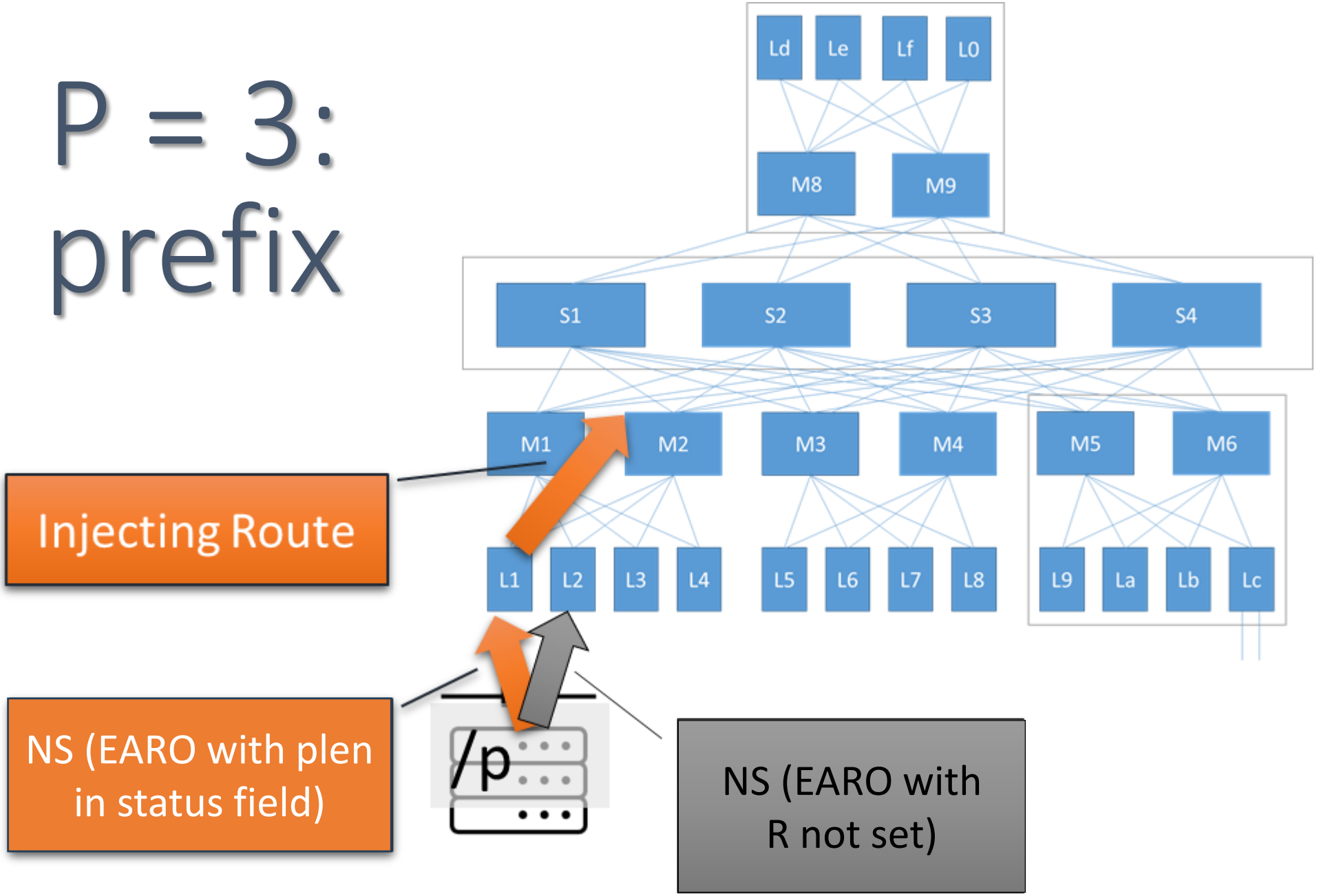
Overload Status field with PLEN in NS message

R flag to redistribute in SGP

F flag to signal source vs destination matching. Useful ?

But field getting saturated

P = 3: prefix

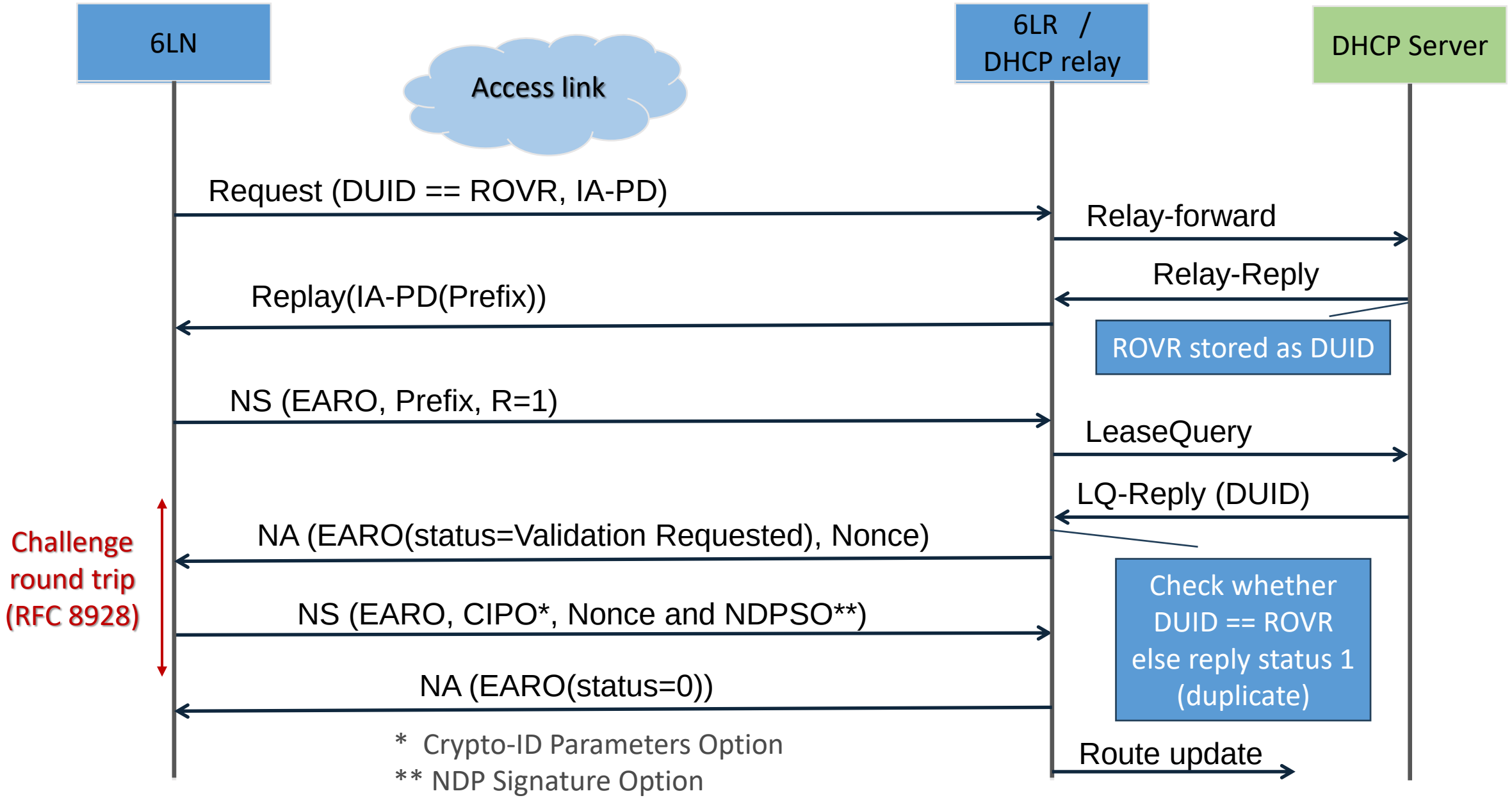

Ld
Le
Lf
L0
M8
M9
S1
S2
S3
S4
M1
M2
M3
M4
M5
M6
L1
L2
L3
L4
L5
L6
L7
L8
L9
La
Lb
Lc
Injecting Route
NS (EARO with plen in status field)
/p
NS (EARO with R not set)

VS draft-ietf-v6ops-dhcp-pd-per-device

Allows the 6LN to register any prefix, whether obtained as DHCP or else

Using the ROVR as client ID, ownership can be verified with DHCP server

Roaming within domain allows delegated prefix mobility (R flag on)


6LN
Access link
6LR / DHCP relay
DHCP Server
Request (DUID == ROVR, IA-PD)
Relay-forward
Relay-Reply
Replay(IA-PD(Prefix))
ROVR stored as DUID
NS (EARO, Prefix, R=1)
LeaseQuery
LQ-Reply (DUID)
Challenge round trip (RFC 8928)
NA (EARO(status=Validation Requested), Nonce)
Check whether DUID == ROVR else reply status 1 (duplicate)
NS (EARO, CIPO*, Nonce and NDPSO**)
NA (EARO(status=0))
* Crypto-ID Parameters Option
** NDP Signature Option
Route update

Thanks!

Questions?