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-prefix-registration**
Extends RFC 8505 for prefixes

**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
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
\[ P = 3: \text{prefix} \]
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).
Challenge round trip (RFC 8928)

Request (DUID == ROVR, IA-PD)

Replay(IA-PD(Prefix))

NS (EARO, Prefix, R=1)

NA (EARO(status=Validation Requested), Nonce)

NS (EARO, CIPO*, Nonce and NDPSO**)

NA (EARO(status=0))

* Crypto-ID Parameters Option
** NDP Signature Option

Check whether DUID == ROVR else reply status 1 (duplicate)

Route update

DHCP Server

LeaseQuery

LQ-Reply (DUID)

ROVR stored as DUID

Relay-Reply

Relay-forward

Access link

6LR / DHCP relay

6LR

6LN

DHCP Server

Access link

Request (DUID == ROVR, IA-PD)

Replay(IA-PD(Prefix))

NS (EARO, Prefix, R=1)

NA (EARO(status=Validation Requested), Nonce)

NS (EARO, CIPO*, Nonce and NDPSO**)

NA (EARO(status=0))

* Crypto-ID Parameters Option
** NDP Signature Option

Check whether DUID == ROVR else reply status 1 (duplicate)

Route update
Thanks!

Questions?