

Unicast Lookup for WiND

draft-thubert-6lo-unicast-lookup

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IETF 105

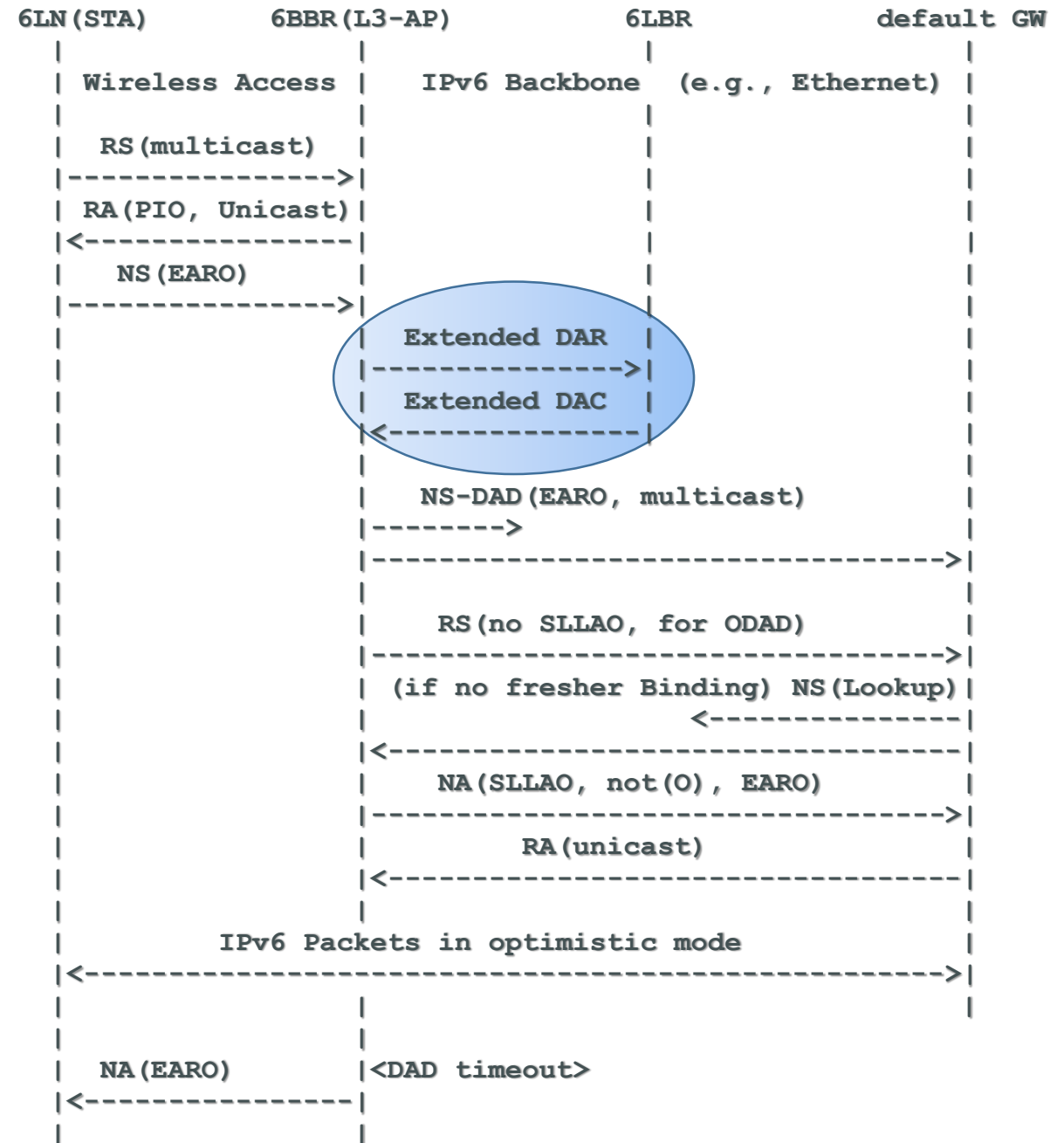
Montreal

Unmet expectations

- An IPv6 subnet should scale (like above 10K Nodes)
 - Required in case of IOT and overlays serving VMs
 - Already works in route-over mesh (deployed e.g., in Smartgrid applications)
 - Impaired by broadcast storms in case of broadcast emulation
 - Need to eliminate per node broadcast (as used in DAD and AR)
- Overlays need a Map resolver for the tunnel endpoints
 - Problems with snooping (silent node, missed packets, rapid movements...)
 - Need a solid state (contract with lifetime and maintenance), not a cache
 - Need a standard way to populate the resolver, a natural side effect of ND

Within WiND General Design

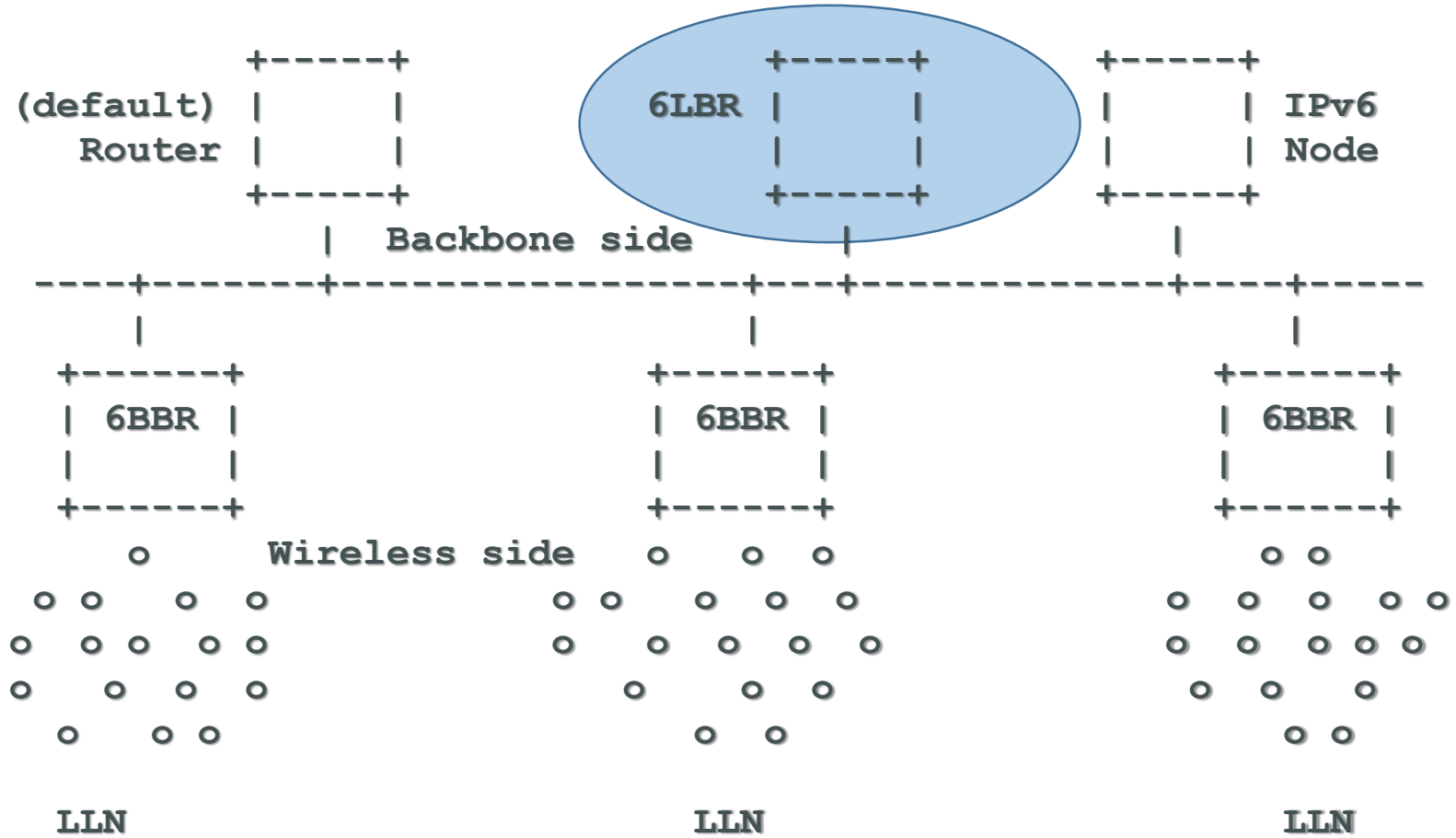
- Registration for guaranteed service
 - Even with intermittent connectivity
 - DAD protection on behalf for lifetime
 - Extensible for lookup
- Routing vs. Bridging Proxy
 - Bridging advertises the SLLA of the 6LN
 - Routing hides the 6LN and routes
 - Routing keeps L2 stable
- Model
 - Link is broadcast domain
 - Subnet <> Link
 - => Not on-link and routing



Status

- <https://tools.ietf.org/html/draft-thubert-6lo-unicast-lookup-00>
 - Unicast registration and lookup via NS/NA
 - (indirect) Address Mapping messages derived from EDAR / EDAC
 - A new Status “Not Found” in NA(EARO) and Address Mapping Confirm
 - 6LBR signals itself by new "B" bit in 6CIO (RFC 7400) in RA msgs
 - (Other) Routers use Authoritative Border Router Option (RFC 6775)
 - Anycast address for 6LBR ala MIP-HA?
- Next Questions
 - Generalize WiND to non-6lo networks?
 - Transfer to 6MAN?

General Design



Place a 6LBR (RFC 6775 / RFC 8505) on the backbone (designed for DAD not AR)

Centralizes the registrations for all nodes in the subnet that register

Additions to use 6LBR for Address Resolution as a unicast request

Address Mapping Messages

Code Prefix	Meaning	Reference
0	Duplicate Address Detection	RFC 6775
1	Address Mapping	This RFC
2...15	Unassigned	

Table 2: New Code Prefixes for ICMP type 157 DAR message

Code Prefix	Meaning	Reference
0	Duplicate Address Detection	RFC 6775
1	Address Mapping	This RFC
2...15	Unassigned	

Table 3: New Code Prefixes for ICMP type 158 DAC message

No new ICMP type, extend existing 157/158 used for DAR / DAC (RFC 6775)

Use different ICMP Code – which is split in code prefix and suffix (RFC 8505)

Also support for unicast NS(Lookup) which requires the 6LBR to be on link

6lo standard work



A proactive setting of proxy/routing state to avoid multicast due to reactive Duplicate address detection and lookup in IPv6 ND

- [RFC 8505](#) (Issued 11/2018)
 - The registration mechanism for proxy and routing services
 - Analogous to a Wi-Fi association but at Layer 3
- [draft-ietf-6lo-backbone-router](#) (WGGLC complete 1/25)
 - Federates 6lo meshes over a high-speed backbone
 - ND proxy analogous to Wi-Fi bridging but at Layer 3
- [draft-ietf-6lo-ap-nd](#) (WGGLC complete 3/26)
 - Protects addresses against theft (Crypto ID in registration)
- [draft-thubert-6lo-unicast-lookup](#)
 - Provides a 6LBR on the backbone to speed up DAD and lookup
- [draft-thubert-6man-ipv6-over-wireless](#) (new draft)
 - IPv6 ND vs. WiND applicability to wireless networks

A blue starburst badge with the text 'NEW DRAFT' in white, bold, uppercase letters.

NEW
DRAFT