RO without HA

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RO with HA

Why Route Optimization?

- Use shortest routing path: Reduces network congestion and delay
- Substantially reduces load on HA

Why HA during RO? ➔ Relay Function!

- Location service: MN is reachable if not at home

  Not needed for mobile-client ⇔ public-server traffic.

  Could be done via DynDNS or SIP.
- Relay CN's mobility headers

  CN could send headers on shortest routing path.
- Permits home tests if MN is not at home

  Not applicable to RO-security solutions of RFC 4866 & RFC 4449.

  Not applicable to handovers between interfaces of multi-homed hosts.

There are many use cases of RO where HA is not needed.

Permit RO without HA

Motivation

- HA is not needed for many use cases of RO.
- RO w/o HA adds robustness: mobility is supported if HA is temporarily unavailable.
- RO w/o HA adds flexibility: mobility is supported if MN has no HA.
- RO w/o HA requires only minor protocol changes.
- HA adds signaling and processing overhead
  - When away from home, MN must start session with Type-2-Routing- and HoA-Option headers
  - Multi-homed MN must use home link to avoid this overhead
  - Additional Signaling MN ⇔ HA

Strategy

- First introduce HA-free RO (opposed to HA-bound RO).
- Then handle temporary HA-unavailability as a special case of HA-free RO.

RO without HA: How does it work?

HA-free operation

- MN declares one of its (publically routable) IPv6 addresses as a virtual HoA.
  Therefore, MN is virtually at home!
- The virtual HoA is used in the same manner as the permanent HoA.
- MN conducts home-tests from its virtual HoA. Since virtually at home, no HA needed!
- Correspondent registration: As before.
- RO security as before: RRT (RFC 3775); Pre-shared keys (RFC 4449); CGA (RFC 4866)

HA becomes temporarily unavailable

- When signaling to HA breaks, MN switches to HA-free operation
- MN may try to re-establish connectivity with HA during HA-free operation
- If successful, MN may switch back to HA-bound operation

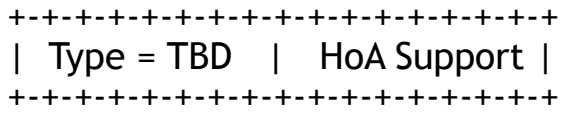
Consequences and Limitations

Consequences of HA-free RO

- No RH2- and HAO-headers needed until MN moves for first time ☺.
- Sessions to *same* CN *may* start from *old* HoA if BU entry and binding cache already exist (same as present MIPv6).
- A multi-homed MN may use a *different* virtual HoAs for every session or correspondent (same as present MIPv6)

Limitations of HA-free RO

- Without HA-fallback, MN must know if CN supports MIPv6 (outside scope of standard!)
- Virtual HoA must be on link during home-tests
  - RFC 3775: always; RFC 4449 & 4866: at or before session start
- MN and CN cannot move at the same time (BU collisions)
- When CN is mobile, it MUST send mobility headers to MN's current on-link address:
  - Not compliant with present MIPv6.
  - Requires new mobility header option: "HoA-Support option"



THANK YOU !