ISIS Auto-Configuration

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Motivation

- There might be multiple routers in one home-networks. [ietf-homenet-arch]
- Plug-N-Play is needed in homenet
- Routing protocols also need to be P-N-P
- There is already an OSPFv3-AutoConfig mechanism [ietf-ospf-ospfv3-autoconfig]
- An ISIS version also makes sense

Scope

- **The scenarios are supposed to be IPv6.**
- **Automatic addressing is NOT in the scope of this document.**
  - homenet-wg is dealing with it:
    - draft-arkko-homenet-prefix-assignment-04
    - draft-baker-homenet-prefix-assignment-01
- **ISIS-AC in this document only supports routers operating:**
  - in a single ISIS area
  - in a single process (instance)
  - only in level-1 operation mode
  - NOT consider multiple routing protocols interaction
- **Regarding Trill-ISIS-Autoconf**
  - It is a Trill-Dedicated ISIS instance
  - Could be distinguished in layer-2
  - No conflict/overlap with this draft

ISIS-AC Approaches

- Default configurations in a router
  - ISIS SHOULD be enabled on all interfaces in a router as default.
  - IS-IS interfaces MUST be auto-configured to an interface type corresponding to their layer-2 capability.
    - E.g. Ethernet
    - PPP
    - …

ISIS-AC Approaches

- ISIS NET Generation

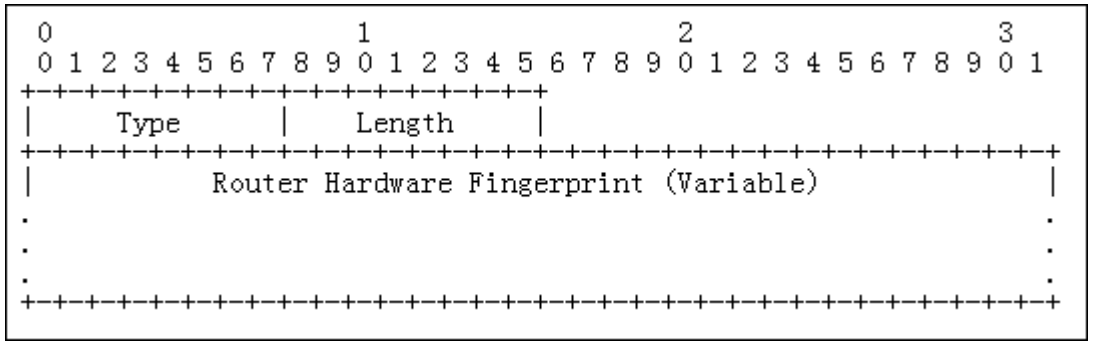
Area Address	System ID	NSEL
Variable length from 1-13 octets	6 octets	1 octet

In ISIS-AC:

- Area Address field MUST be **Zero** in 13 octets length.
- System ID field SHOULD be the **MAC address** of the ISIS enabled interface.
- NSEL MUST be **Zero**.

ISIS-AC Approaches

- ISIS NET duplication resolution
  - Since MAC addresses might duplicated, we need a NET duplication resolution mechanism.
  - Re-use the Router-Hardware-Fingerprint TLV defined in [OSPFv3-Autoconfig]



  - The contents of the hardware fingerprint should be some combination of CPU ID, or serial number(s) that provides an extremely high probability of uniqueness.
  - It MUST be based on hardware attributes that will not change across hard and soft restarts.
  - The TLV content MUST NOT use MAC address only.
  - Implementations SHOULD use other information exclude MAC address.

ISIS-AC Approaches

- Basic NET duplication resolution procedures
  - The Router-Hardware-Fingerprint TLV MUST be included in the first originated level-1 LSP by every auto-configuring routers.
  - An IS-IS auto-configuring router MUST compare a received self-originated LSP's Router-Hardware-Fingerprint TLV against its own one.
  - If the they are not equal, there is a NET duplication…
  - and the Router with the numerically smaller router hardware fingerprint MUST generate a new NET.
  - After selecting a new NET, the LSP with the prior duplicate NET MUST be purged.
  - And any IS-IS neighbor adjacencies MUST be reestablished.

Next Steps

- Complete the technical designs
  - Adjacency formation considerations
  - Detailed procedures of NET duplicated resolution
  - Other aspects from comments/ML-discussion
    (Thanks for your feedbacks in advance!)
- Solicit more review/comments
- To see if ISIS in favor of adopting such a work?

Thank you!

Your comments would be appreciated much.

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