Non-Application messages for ICN

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Problem Statement

- Need ways to bootstrap ICN nodes
  - Need this to be secure without presuming a globally available keying service
- Need link and neighbor/adjacency initialization and maintenance
  - In IP this was custom per routing protocol, we can do better
- Need localized error reporting over single hop
- Do not need (IMO):
  - "ICMP" equivalent – Interest-Return in CCN or NAK in NDN does this
  - Some kind of "Push" to proactively report errors

Toolkit we can use

- Local/custom Namespaces
  - Explicitly scoped via the name
  - Implicitly scope via forwarding behaviors
- Propagation/Scope Control
  - Via Hop Limit
    - HL=0 -> Local forwarder only
    - HL=1 -> neighbor forwarder
    - (Note: CCNx has a hop limit, NDN does not)
  - Via administrative scoping
    - Some kind of "link local", "Site local" markers via new protocol machinery

Some issues

- Do we need a "different" propagation model for establishing and managing control state? (c.f. work of Schmidt et. al.)

- How do we securely bootstrap nodes and adjacencies without global keying

- What are interactions (if any) with L2 mapping/adaptation protocols

- Can/should we abandon Interest/Data exchanges for these functions?