Configuring Compression Contexts

DHCPv6 for 6lowpans

What's Wrong with RFC 6775?

Requirement originated from Zigbee-NAN group where network topologies typically consist of multiple thousands of nodes

In this environment, reduction of non-application network traffic is paramount – there is an existing goal of using RPL DIOs instead of neighbor discovery (ND) for routing and SLAAC if necessary – there seemed to be no reason to support both DIOs and ND on the network (except for compression contexts)

Without ND, we lose a standard way to configure compression contexts

The target network also requires trickle multicast – no way to configure trickle multicast (MPL) parameters without DHCPv6 (so far)

There may be other network-wide parameters we would like to configure, and turning ND and DIO into a network configuration protocol seemed like a bad idea

DHCP “Profile” for 6LoWPANs

- Uses 2-packet “RAPID COMMIT” transaction
- stateful acquisition of initial parameter set – “information-request” transactions for any updates
- First transaction utilizes DHCP relay – after which nodes acquire unicast ULA/GUA of DHCP server and perform direct queries to the server
- Routed, multi-hop and single-hop (no forwarding) topologies work the same way

Alternatives

- Use ND (RFC 6775) solely to carry compression context
- Specify another option for RPL DIO messages to carry compression contexts
  - Would only work in RPL-enabled networks
- Use DHCP
- If DHCP is unsuitable, define some new dynamic configuration protocol more suitable for 6LoWPANS (maybe COMI-like) ?

Alternatives

For networks (such as smart meter networks), and other large lowpans, it seems like there should be a way to dynamically configure networks with parameters beyond only the basics needed for IPv6 connectivity. It didn't seem like a good idea to turn ND and DIO into generic configuration protocols, by bundling more and more options into these messages….although it is convenient and available.