

A Unified Stateful/Stateless Autoconfiguration Service based on IPv6 Neighbor Discovery Extensions

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A Unified Stateless/Stateful Autoconf Service

- IPv6 Neighbor Discovery (RFC4861/RFC4862) supports Stateless Address AutoConfiguration (SLAAC)
- DHCPv6 (RFC3315/RFC3633) is a separate stateful service
- **Goal: a unified stateless/stateful autoconfiguration service**

Benefits of a Unified Service

- Condense complex multi-messaging exchanges into a single and concise message exchange
- Reduces congestion on low-end links (e.g., 6LoWPAN, satellite communications, aeronautical wireless, etc.)
- Reduces number of multicast messages that could unnecessarily wake up sleeping nodes
- **Accommodates both stateless and stateful services in a way that combines the best aspects of both**

Unified Service Mechanisms

- Define a new IPv6 ND option code known as the “DHCPv6 Option”
- Option encapsulates DHCPv6 client/server messages
- When a node comes onto a link, it can send a Router Solicitation (RS) with an embedded DHCPv6 option
- Routers on the link receive the option and forward it to the DHCPv6 server
- DHCPv6 server processes the option as a DHCPv6 client request, and forwards a DHCPv6 reply to the client via the router(s)
- Routers include the DHCPv6 reply in a DHCPv6 option in their unicast Router Advertisement (RA)
- **Four or more messages condensed into just two**
- **No need for examining RA “M” & “O” bits**
- **Legacy routers that do not recognize the option simply ignore it**
- **A single unified service for all autoconfiguration**

Unified Service Mechanisms (2)

- Other types of stateful options could be include in IPv6 ND messages, e.g., PIOX options (PIO with “X” bit set)
- Stateful services could be provided at L2, but would entail additional messaging on links where IPv6 ND messaging could provide a unified service

Draft History

- Draft -00 posted 11/20/2017. Announced to the list, with several comments received
- Draft -01 incorporated padding sub-option to pad DHCPv6 message option to even quadword alignment
- Drafts -02 thru -04 included other stateful service options, including PIOX and out-of-band L2 messaging
- Now at Draft -05
- <https://datatracker.ietf.org/doc/html/draft-templin-6man-dhcpv6-ndopt>

Backups