DHCPv6 Failover IETF81

draft-ietf-dhc-dhcpv6-redundancy-consider-00
draft-mrugalski-dhc-dhcpv6-failover-requirements-00

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DHCPv6 Redundancy considerations :: History

- Preparatory work before failover becomes available
- draft-ietf-dhc-dhcpv6-redundancy-consider-00
- Semi-redundant approach
- Acknowledges that failover is required
- 2 models discussed:
    - Service Provider model
    - Enterprise model
- 3 deployment models:
    - Split prefixes
    - Multiple unique prefixes
    - Identical Prefixes
- BCP

DHCPv6 Redundancy considerations :: Status

Adopted after Prague (April 2011)

- Stable, no comments requiring changes
- Several supportive voices received
- Focus shifted to failover work
- -01 to be published next week
    - DNS Update problem correction
    - Minor other corrections
- Asking for WGLC after -01

DHCPv4 Failover :: History

- Successful as protocol

- Failure as a standard

- WG work started in 1997, abandoned after 2003

- Causes of v4 failure

    - Monolithic draft (130+ pages)

    - BCP + requirements + protocol draft, all-in-one

    - Includes lots of extra features, e.g. load balancing

    - No feasible way to review it

    - Failed after 7 years of work

- We want to avoid repeating the same fate with v6

DHCPv6 Failover :: The Grand Plan

- Step 0: Redundancy considerations draft (bcp)
- **Step 1: Requirements document (info)**
- Step 2: Design document (info/std)
- Step 3: Protocol document (std)
- Possible extension drafts
    - Load-balancing
    - m-to-m model
    - Other resource assignment mechanisms
    - ...

The ultimate goal is ***protocol spec***

DHCPv6 Failover :: Workflow

- Call for volunteers on DHC mailing list (2011-05-09)
  - 20 volunteers, 10 contributors
- Weekly calls since
  - fast turn around
  - Meeting announcements/notes on DHC list
  - Bridge # not announced publicly (spam prot.)
  - Will migrate to webex
- Initial version published (2011-06-26)
- Continue weekly calls, shifted focus to design

DHCPv6 Failover :: Work done so far

- Initial submission: draft-mrugalski-dhc-dhcpv6-failover-requirements-00

- 2 authors + 8 contributors

- Participating 3 authors of the original v4 spec

- Involved engineers from: Alcatel-Lucent, Cisco, Comcast, Ericsson, Google, Huawei, ISC, Jagornet Technologies, Nominum, Time Warner Cable, Videotron, Weird Solutions, …

DHCPv6 Failover :: Requirements

- Number of partners MUST be exactly 2 (1-1 pair)

- Prefix Delegation MUST be supported

- Prefix/address pool MUST NOT participate in more than one relationship

- Server MAY participate in more than one relationship if those relationships cover different prefix or address pools

- Healthy partner MUST continues serving leases provided by failed partner

- Failover MUST NOT introduce significant performance penalty

  => lazy updates => inconsistent dbs => network partition

- Pair of failover servers MUST recover from:
  - Server-down event
  - Network-partition event

- The design MUST allow secure communication

- Extensions to the protocol SHOULD be allowed, when possible

DHCPv6 Failover :: Open Questions

- Hundreds, see failover meetings minutes. Examples:
- Q: Is there really a market for inter-vendor interop?
- Q: Reuse MCLT concept from v4? Try something else?
- Q: Conflict resolution mechanism?
- Q: Connection: TCP or UDP?
- Q: State machine?
- Q: One mechanism for address (millions) and prefixes (a few)? Two separate?
- Q: PD: Fixed or variable lengths?
- Q: Transmission of information: LQ-based? BLQ-based? Something new?
- Q: Connection establishment procedure?
- Q: Is pool rebalancing needed?
- Q: …

Too much for a single DHC meeting

Join the weekly meetings if you are interested

DHCPv6 Failover Schedule & Next Steps

- Step 0: Redundancy considerations
  - After -01, no further work planned
  - Requesting WGLC

- Step 1: Requirements document (info)
  - Initial revision for Quebec (IETF'81, July 2011)
  - Requesting adoption

- Step 2: Design document (info/std)
  - Call for volunteers
  - Initial revision for Taiwan (IETF'82, Nov 2011)

- Step 3: Protocol document (std)
  - TBD

- Possible extension drafts

- There are several vendors interested in implementation

Thank you