LDP DoD
draft-beckhaus-ldp-dod-00.txt

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- Motivation
- Solution
- Next steps

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 Seamless MPLS design enables a single IP/MPLS network to scale over core, metro and access parts of a large network infrastructure using standardized IP/MPLS protocols. One of the key goals of Seamless MPLS is to meet requirements specific to access devices, based on their position in the network topology and their compute and memory constraints limit the amount of state they can hold. This can be achieved with LDP Downstream-on-Demand (LDP DoD) as specified in RFC 5036 [RFC5036].
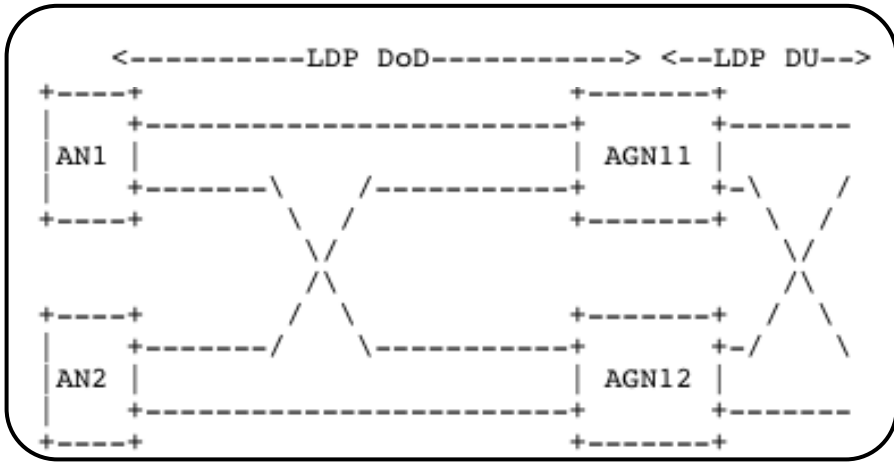
This document describes LDP DoD use cases and lists LDP DoD procedures in the context of Seamless MPLS design.
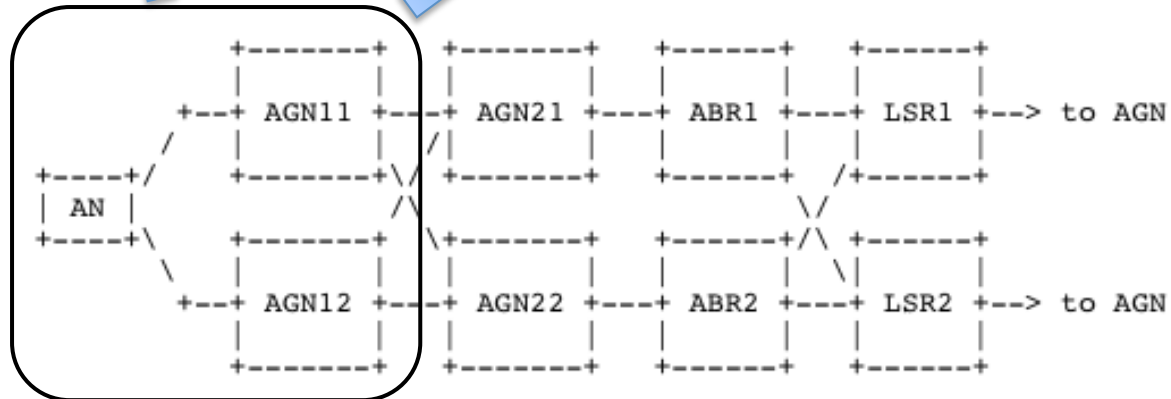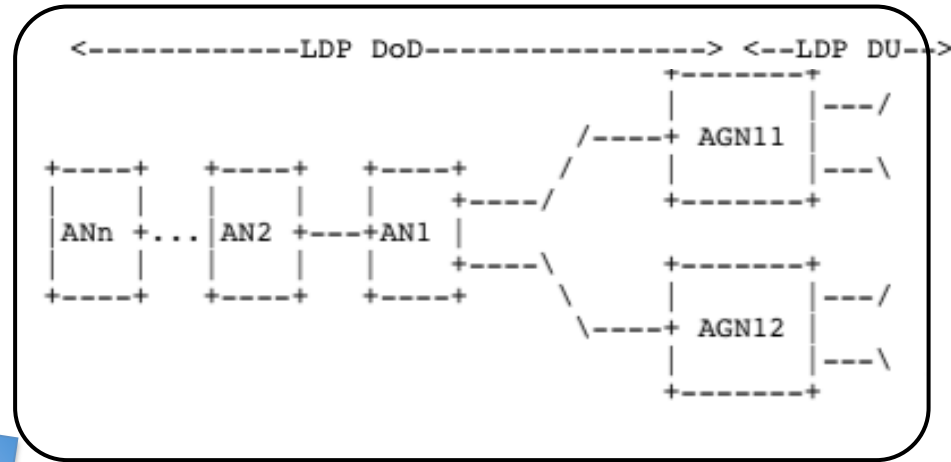
Motivation

- Seamless MPLS design (draft-ietf-mpls-seamless-mpls) relies on LDP DoD for scalability and support of lower-end access devices

- RFC5036 specifies LDP Downstream on Demand mode of operation, but LDP DoD is not widely available on modern IP/MPLS devices

- Concern that LDP DoD implementations will not fully support Seamless MPLS use cases

- Goal of the draft is to address that

Reference Topologies

Multi-homed access devices

```
        <-----------LDP DoD-----------> <--LDP DU-->
+----+                          +-------+
|     +-----------------------  |       +-------
| AN1 |                         | AGN11 |
|     +--------\     /----------+       +-\     /
+----+          \   /                   +-------+ \   /
                 \ /                              \ /
                  X                                X
                 / \                              / \
+----+          /   \                   +-------+ /   \
|     +--------/     \----------+        |       +-/   \
| AN2 |                         | AGN12 |
|     +-------------------------+       +-------
+----+                          +-------+
```

Sub-tended access devices

```
      <------------LDP DoD-----------------> <--LDP DU-->
                                       +-------+
                                       |       |---/
                               /----+ AGN11 |
+----+   +----+   +----+      /   +-------+ |---\
|    |   |    |   |    +-----+    +-------+
|ANn +...|AN2 +----+AN1 |    +-----+
|    |   |    |   |    +-----\    +-------+
+----+   +----+   +----+      \   |       |---/
                               \----+ AGN12 |
                                       |       |---\
                                       +-------+
```

```
                +-------+  +-------+  +-------+  +-------+
                |       |  |       |  |       |  |       |
           +--+ AGN11 +--+ AGN21 +---+ ABR1 +---+ LSR1 +--> to AGN
          /    |       |  |       |/|  |       |  |       |
+----+/   +-------+\ +-------+  +-------+  /+-------+
| AN |                 /\                      \/
+----+\   +-------+/ +-------+  +-------+  /\+-------+
          \    |       |  |       |\ |  |       |  | \|       |
           +--+ AGN12 +--+ AGN22 +---+ ABR2 +---+ LSR2 +--> to AGN
                |       |  |       |  |       |  |       |
                +-------+  +-------+  +-------+  +-------+

static route      ISIS L1 LDP              ISIS L2 LDP

<-Access-><--Aggregation Domain--><----------Core---------->
```

LDP DoD Use Cases

- Seamless MPLS use cases provide context for the required LDP DoD operation procedures

- AN and AGN behaviours are described for the following cases

  – Access Node Start-Up

  – Access Node Service Provisioning

  – Access Node Service Decommissioning

  – Service Failure

  – Network Transport Failure

LDP DoD Procedures

- LDP DoD procedures are mapped to the Seamless MPLS use cases

- Following LDP DoD procedures with associated trigger events are described for LDP DoD LSRs (AN and AGN)

  - LDP DoD Session Negotiation

  - Label Request Procedures

  - Label Withdraw Procedure

  - Label Release Procedure

Next Steps

- Address open points
  - (better) cover daisy chained AN topologies
  - Add dynamic routing on access nodes
  - Optimize control plane signaling convergence in case of downstream route recovery
- Address comments (received and to be received)
- Progress to MPLS WG adoption