Option B from "Migration between normal flooding and flooding reduction"

Option B is about the transfer between flooding reduction (either centralized mode or distributed mode) and normal flooding. It is from the procedure in thread "Migration between normal flooding and flooding reduction", and described below in some details, including behavior and extension.

Note that the transfer between centralized mode and distributed mode is in draft-ietf-lsr-dynamic-flooding and Option B can be considered as an extension to it (refer to the Figure below).

```
/-------------------------------------------------------------\
| Flooding Reduction                                          |
|                                                             |
|            "(Transfer to) Centralized Mode"                 |
|                            |                                |
|   /-----------------\      V      /-----------------\       |
|   | Centralized Mode | ---------→ | Distributed Mode |      |
|   |                 | ←----------  |                 |      |
|   \-----------------/      ^      \-----------------/       |
|                            |                                |
|           "(Transfer to) Distributed Mode"                  |
|                                                             |
\-------------------------------------------------------------/
                   |          ^
   "(Transfer to)  |          | "(Transfer to)
   Normal Flooding" |         | Flooding Reduction"
                   V          |
/-------------------------------------------------------------\
| Normal Flooding                                             |
|                                                             |
\-------------------------------------------------------------/
```
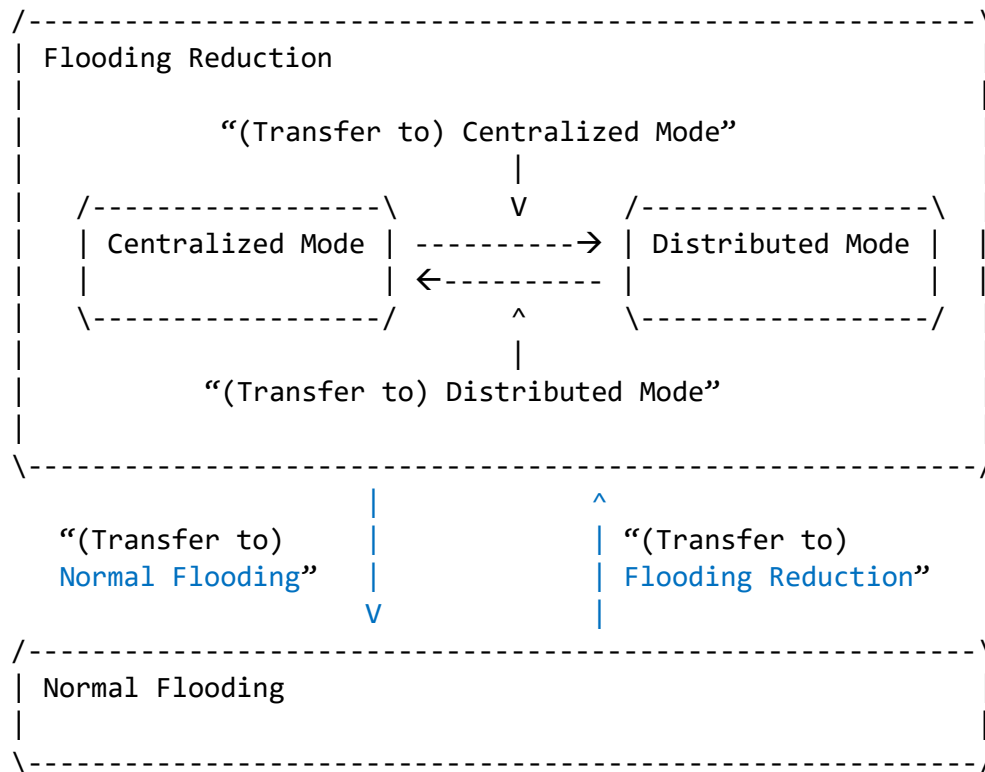
        Figure 1. Transfer between Flooding Reduction and Normal Flooding

When the IGP in an area runs in the flooding reduction (either centralized mode or distributed mode), the behavior to transfer from the flooding reduction to the normal flooding is as follows:

1. on the leader node, "(Transfer to) Normal Flooding" is configured;
2. the leader advertises "(Transfer to) Normal Flooding" to all the other nodes;
3. every node transfers to the normal flooding after obtaining the instruction for transferring to the normal flooding. Every node will floods link states using all its local links instead of the local links on the flooding topology (FT for short).

For the centralized mode, after transferring to normal flooding, the leader of the area stops computing and advertising the FT, each of the other nodes stops receiving and building the FT. For the distributed mode, every node in the area stops computing and building the FT.

At this point, the IGP in the area has transferred to the normal flooding from the flooding reduction (either centralized mode or distributed mode).

When the IGP in the area runs in the normal flooding, the behavior to transfer from the normal flooding to the flooding reduction (either centralized mode or distributed mode) is as follows. It is almost the same as that described in draft-ietf-lsr-dynamic-flooding, but with minor enhancement in blue color.

> For centralized mode (i.e., when centralized mode is configured),
> 1) the leader advertises "Flooding Reduction" in the centralized mode to all the other nodes;
> 2) the leader computes the FT and advertises the FT to the other nodes;
> 3) each node floods the link states using the FT after it receives/has the whole FT.
>
> For distributed mode (i.e., when distributed mode is configured), an algorithm is also configured to be used by every node to compute FT
> 1) the leader advertises "Flooding Reduction" in the distributed mode including the algorithm to all the other nodes;
> 2) each node computes its FT and floods the link states using the FT.
>
> At this point, the IGP in the area has transferred from the normal flooding to the flooding reduction (either centralized mode or distributed mode).

To support the above behaviors, Area Leader Sub-TLV needs to be extended. Three bits of one octet may be used to indicate a flooding mode (FM) such as "Normal Flooding". The other bits are reserved. The values proposed for FM are as follows:
1 for "Flooding Reduction" (centralized or distributed mode is implied/indicated by the algorithm)
2 for "Normal Flooding"

For OSPF Area Leader Sub-TLV, the current Sub-TLV below

```
   0                   1                   2                   3
   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
  |             Type              |             Length            |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
  |    Priority   |   Algorithm   |            Reserved           |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                  (Current) OSPF Area Leader Sub-TLV
```

is extended to

```
   0                   1                   2                   3
   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
  |             Type              |             Length            |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
  |    Priority   |   Algorithm   | FM |          Reserved        |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                  (Extended) OSPF Area Leader Sub-TLV
```

FM = 1: Flooding Reduction

> Alogrithm = 0: Centralized Mode; Algorithm = N (N>0): Distributed Mode.

FM = 2: Normal Flooding

Similarly for IS-IS Area Leader Sub-TLV, the current Sub-TLV below,

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Type       |     Length      | Priority       |   Algorithm    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                 (Current) IS-IS Area Leader Sub-TLV
```

is extended to

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Type       |     Length      | Priority       |   Algorithm    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  FM  |Reserved |
+-+-+-+-+-+-+-+-+
                 (Extended) IS-IS Area Leader Sub-TLV
```