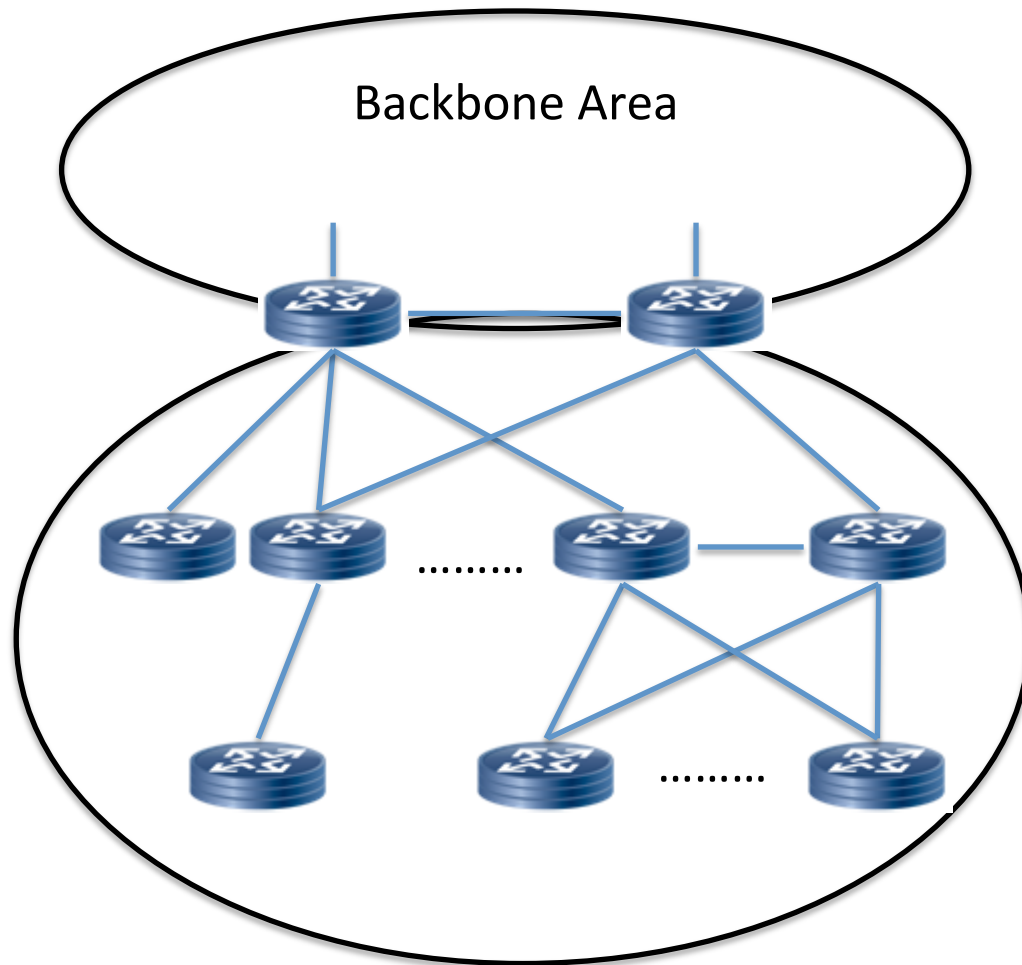# OSPF Extensions for Link State Database Synchronization Group
draft-ylz-ospf-lsdb-sync-group-00

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Background Introduction

Backbone Area

- Devices of access layer have the following characteristics:
  - ✓ Huge devices.
  - ✓ Performance is not enough to support the big LSDB and the big routing table.

Cost of System

- Access Device
  - ✓ Poor CPU and Less Memory.
  - ✓ Can not support many routes.
  - ✓ Can not process many flooding packets.
- Aggregate Device
  - ✓ 500 – 1000 peers or more.
  - ✓ Too many flooding process.
    - ➢ Stability of neighbor
    - ➢ Convergence time
- Multiple Area?
  - ✓ Is it ABR router? Schedule Problem?
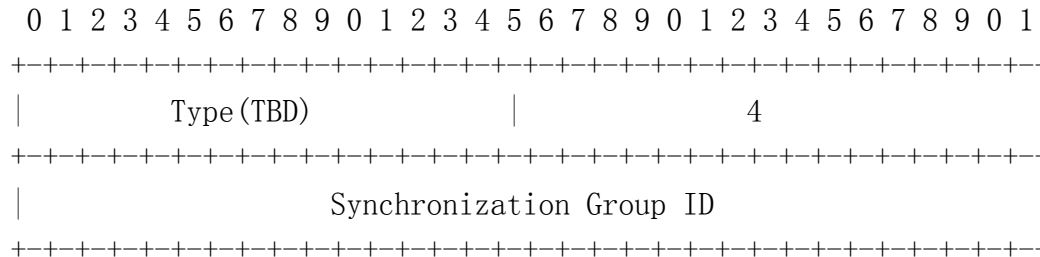 - ✓ SPF schedule, Summary LSA generate and Route aggregate.

Method: Sync Group

Backbone Area

Group Master Router

Group Member Router

Sync Group 1

Sync Group 2

Area 1
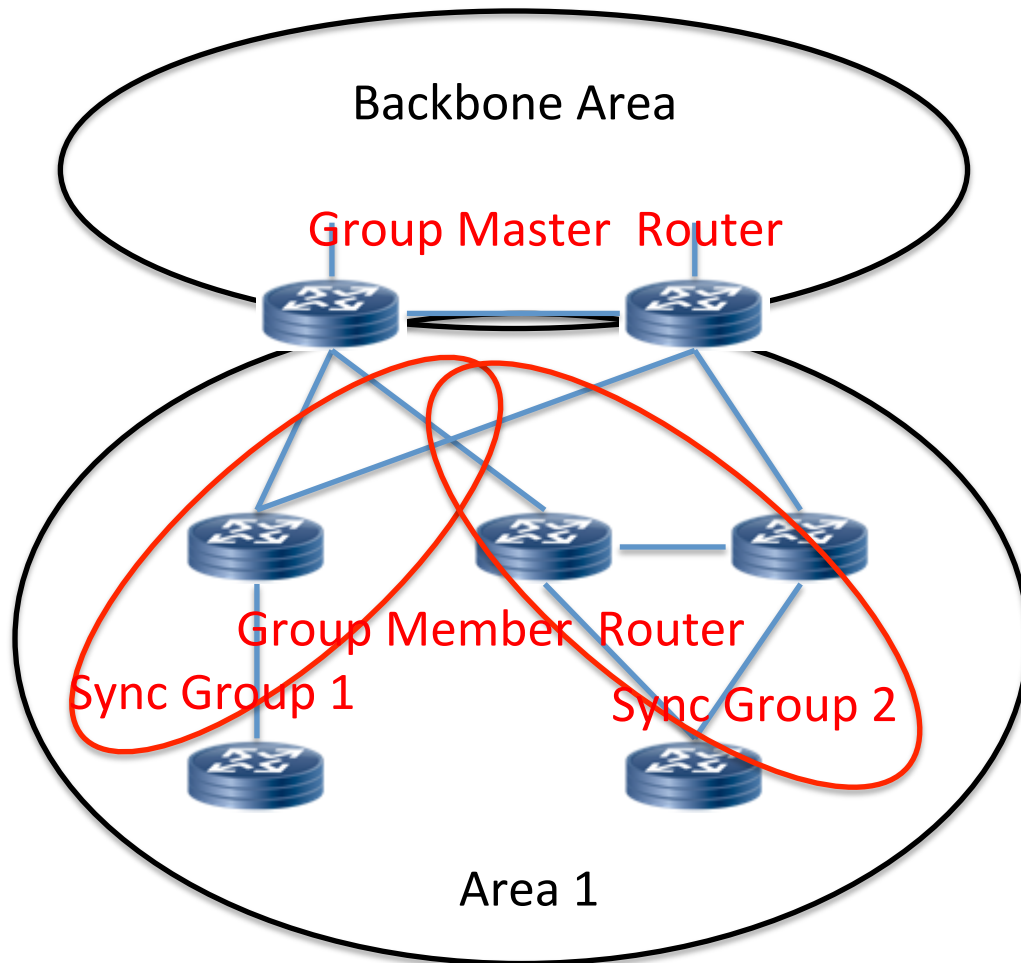
- Goal: Reduce the usage of CPU/ Memory of the access device and traffic of flooding.

- Sync Group = Area in Area.

- The adjacency only is made between the routers with same group ID.

- The LSDB will be synchronized within Sync Group only.

- The "Group Member Router" will add the default route to the nearest "Group Master Router".

- The LLS is used to indicate the router support SYNC GROUP.

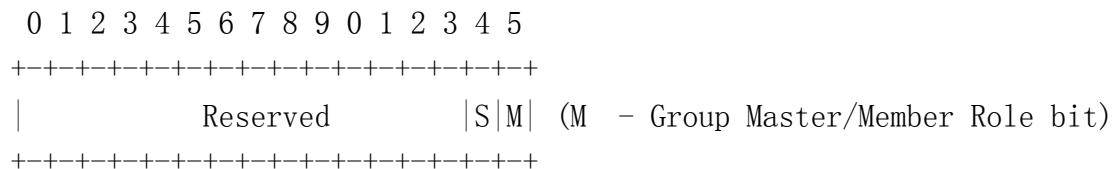- The RI LSA is used to indentify the "Group Master Router".
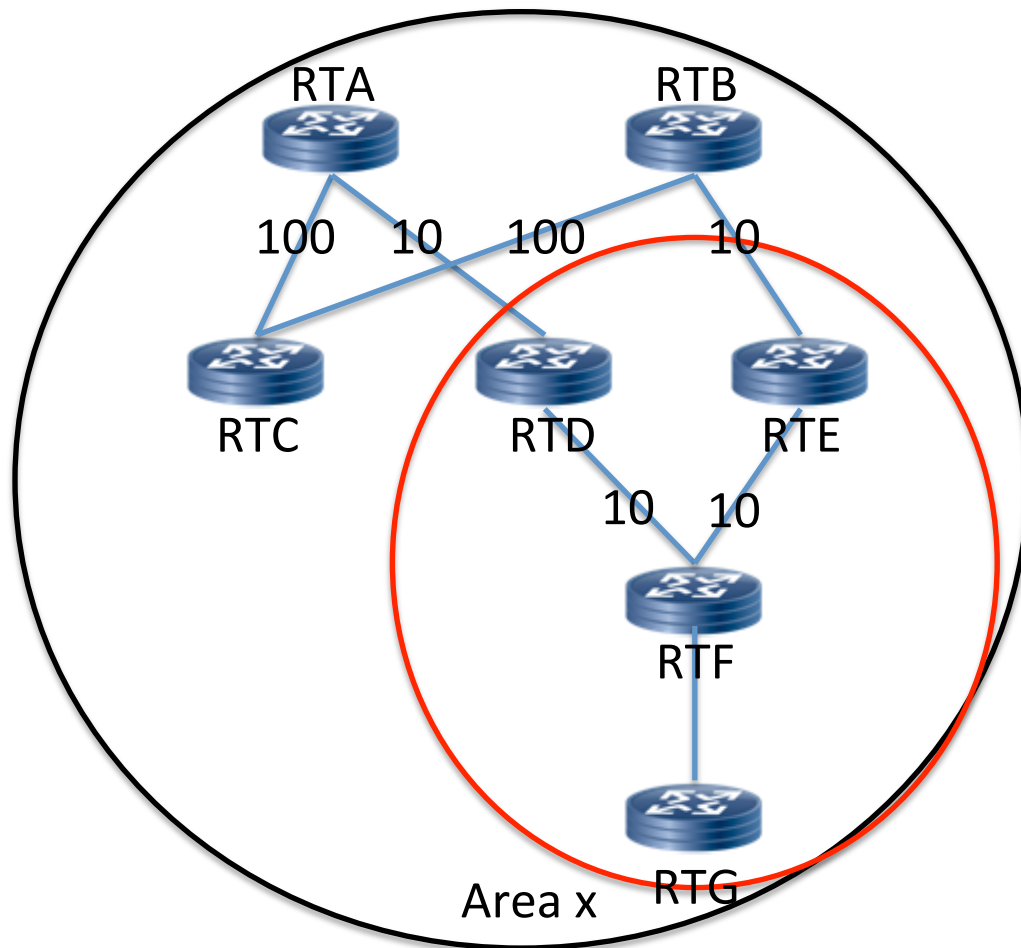
OSPF extension

- New TLV will be added to LLS.

```
 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(TBD)            |               4               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                   Synchronization Group ID                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- New TLV in Router Information LSA
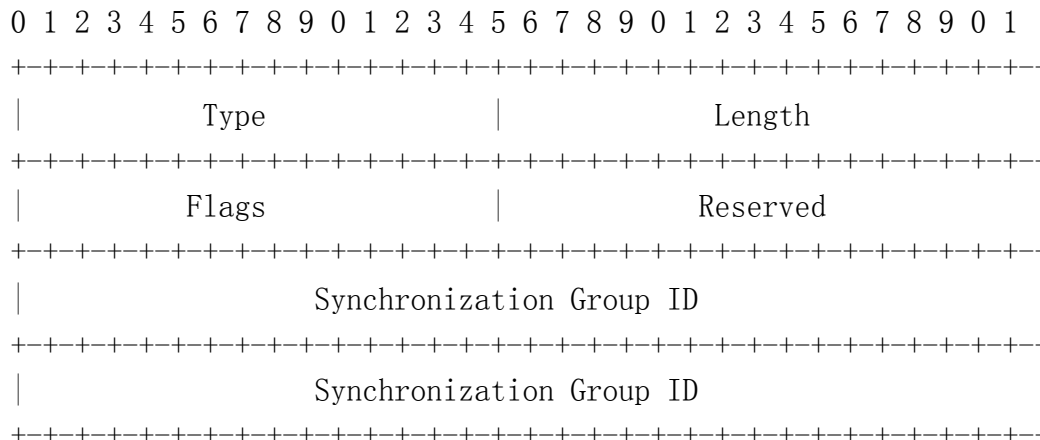
```
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|             Type              |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|             Flags             |            Reserved           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                   Synchronization Group ID                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                   Synchronization Group ID                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
Flags (2 octet):
       0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
     +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
     |          Reserved       |S|M|  (M - Group Master/Member Role bit)
     +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Challenge: Inconsistency of LSDB

RTA

RTB

100   10   100   10

RTC   RTD   RTE

10   10

RTF

RTG

Area x

- **There exists inconsistency!**
- The path from RTA to RTB?
  - RTA to RTC to RTB?
  - RTA to RTD to RTF to RTE to RTB?
  - How to avoid the route loop?
- Method 1: Routing calculation of RTA/RTB/RTC (The router is not in SYNC group) are modified to avoid the path through the SYNC group.
- Method 2: Update the router LSA of "Group Master Router" to remove the link to "Group Member Router". And associated SPF process also need be updated.

Next Steps

- Keep on research to get final solution about path calculation.
- Welcome comments on mailing list.