OSPF Model Enhancements

Version: 0.2

# OSPF Model enhancements

## Leaf for algorithm

The leaf in ospf-area-leader-tlv has a leaf named “Algorithm”.

The convention is to have lower case names for leafs.

There is also a leaf-list under dynamic-flooding-tlv called “algorithm” which might cause confusion.

   +--ro area-leader-tlv {dynamic-flooding-ospf}?

    |  +--ro priority?    uint8

    |  +--ro Algorithm?   uint8

    +--ro dynamic-flooding-tlv {dynamic-flooding-ospf}?

       +--ro algorithm\*   uint8

In the IS-IS model

    +--ro area-leader

    |  +--ro priority?    uint8

    |  +--ro algorithm?   uint8

    +--ro dynamic-flooding

       +--ro algorithms\*   uint8

## Configurable parameters

### On any router that participates in dynamic flooding in an area

#### Questions

1. How is the dynamic flooding mode (centralized vs distributed) determined. Once he area leader is selected, it decides whether the area under it will be centralized or distributed. But is there a configurable knob on that area leader that will make it choose centralized vs distributed.
2. Can the area leader be a centralized SDN controller in the future.

#### Current configurable parameters

A router’s preference for participating in dynamic flooding in a given area is configurable

augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area:

+--rw dynamic-flooding {dynamic-flooding-ospf}?

+--rw enable? boolean

### Area leader configuration

Add configuration parameters

1. A router can be configured to show its preference that it is a candidate for becoming an area leader *in a given area*. So area leader configuration parameters (e.g. priority) should be somewhere under ospf area. Propose to add a container for area leader with following
   1. enable – boolean - to configure that this router can become an area leader in the given area
   2. priority - uint8 – priority will determine area-leader when there are multiple candidates
   3. algorithm – uint8

Highlighted portion is new

augment /rt:routing/rt:control-plane-protocols/rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area:

+--rw dynamic-flooding {dynamic-flooding-ospf}?

+--rw enable? boolean

+--rw area-leader

+--rw enable? boolean

+--rw priority? uint8

+--rw algorithm? uint8

grouping area-leader-configuration {

description

"Enable area leader capability";

leaf enable {

type boolean;

default "false";

description

"Enable area leader capability";

}

leaf priority {

type uint8;

description

"Area leader priority";

}

leaf algorithm {

type uint8;

description

"Dynamic flooding algorithm selection";

}

}

augment

"/rt:routing/rt:control-plane-protocols/"

+ "rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area" {

if-feature "dynamic-flooding-ospf";

description

"Dynamic-flooding config model

augmentation";

container dynamic-flooding {

description

"to Enable/Disable dynamic flooding

for this specific OSPF area";

leaf enable {

type boolean;

description

"Enable/Disable dynamic-flooding";

}

container area-leader {

description

"Area leader configuration parameters";

uses area-leader-configuration;

}

}

}

# Options for an SDN controller acting as area-leader

1. Each router (client) will establish a TCP session to the SDN controller which will perform functions of the area leader.
2. A list of peer ip addresses will be configured under

/rt:routing/rt:control-plane-protocols/rt:control-plane-protocol/ospf:ospf/ospf:areas/ospf:area/df:dynamic-flooding

container. These peer ips will point to a cluster of SDN controllers.

1. This is a patter similar to how a PCE functions in PCEP. A PCE does path computation and advertises LSPs to the client routers. Each client router establishes a TCP connection to PCE.

Another alternative could be establishment of virtual connection to the SDN controller. But virtual connections will need an ABR in between.

## Pros

1. If there is a chance that data centers might use mpls traffic engineering, and they use an SDN controller with BGP-LS and PCEP, then the concept of an area-leader in SDN controller will fit in nicely.

## Cons

1. The disadvantage is that the router to SDN controller connection would be a TCP connection riding over the same network that could be in a transient stage.
2. The area-leader should be centrally located, e.g. a Spine. But an SDN controller will be on a compute hanging off a leaf.