

OSPF Two-part Metrics

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RFC 6845 Hybrid Interface

- A broadcast network with different costs between different pairs of neighbors
- Treat as broadcast for Hello, adjacency and database synchronization purpose
- Treat as p2mp to advertise different costs for different neighbors

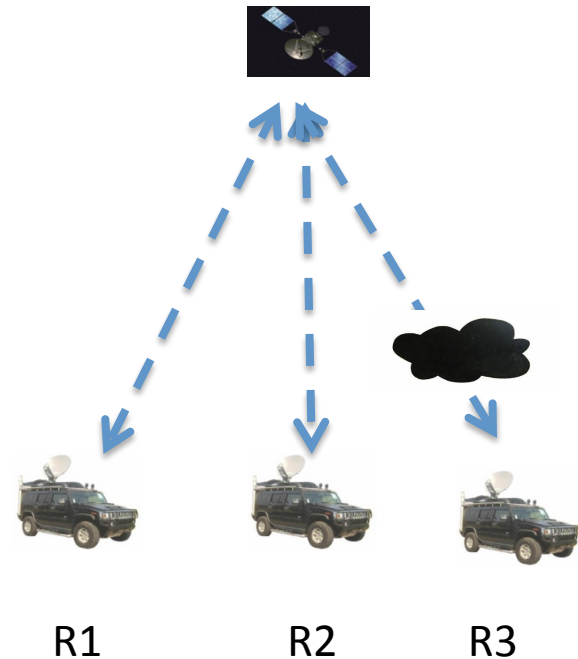
Hybrid interface limitations

- Each Router LSA has $N-1$ links for the interface
 - One for each neighbor
- In some networks, e.g. a satellite radio based one, the change in one router's communication capability causes all attached routers to update their Router LSAs
- This causes unbearable flooding in a large network with routers constantly moving around

Observation 1

- In the example satellite radio network, if one router's communication capability changes, all costs change in a similar fashion:

- other routers' cost to it
- its cost to all other routers

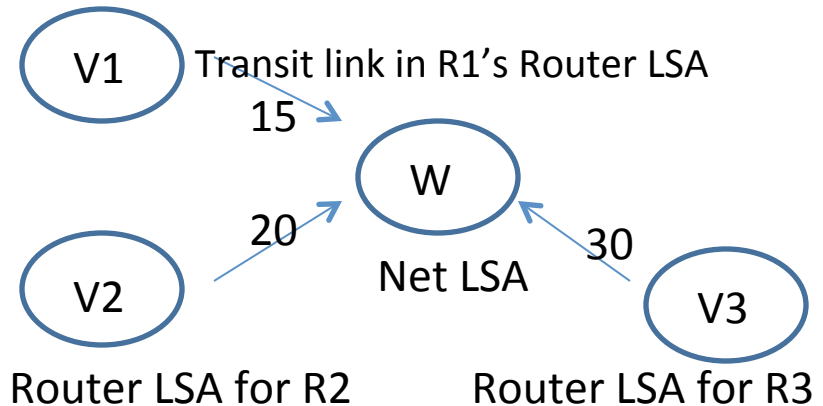


R1->R2: 10
R1->R3: 20 + 150
R2->R1: 15
R2->R3: 25 + 150
R3->R1: 20 + 100
R3->R2: 25 + 100

Observation 2

- Network LSA does not have costs associated with listed routers
 - It is assumed that a router's cost to all neighbors are the same
 - encoded in the transit link in Router LSA
 - Note that different routers can still encode different costs in the transit link of their own Router LSA for the same network

Router LSA for R1



SPF calculation result:

R1->R2,R3: cost 15

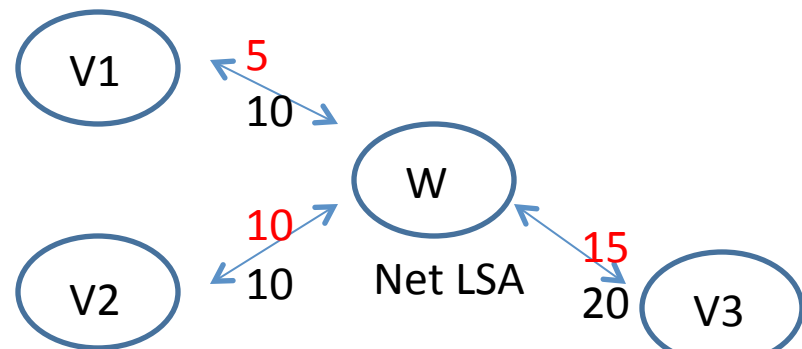
R2->R1,R3: cost 20

R3->R1,R2: cost 30

Proposed solution

- Use Router and Net LSAs instead of advertising p2p links
- Break router to router cost to two parts: to/from-network
- Advertise both in the transit link (of a different type X)
 - For OSPFv2, encode from-network cost as an MT cost
 - For OSPFv3, use TLV per draft-acee-ospfv3-lsa-extend
 - Network LSA as is
- SPF calculation to consider both to-and from-network costs
- When one router's communication capability changes, only its own Router LSA is updated

Router LSA for R1



Router LSA for R2

Router LSA for R3

R1->R2: $10+10=20$

R1->R3: $10+15=25$

R2->R1: $10+5=15$

R2->R3: $10+15=25$

R3->R1: $20+5=25$

R3->R2: $20+10=30$

Plan

- Seeking review & comments
- Polish the solution
 - Finish OSPFv3 TLV details
 - Advertising a router's support for this?
 - If one router does not support this extension, all from-network costs are treated as 0
- Seeking WG adoption