OSPF Adjacency Suppression

draft-cheng-lsr-ospf-adjacency-suppress-03

Weiqiang Cheng (China Mobile)
Liyan Gong (China Mobile)
Changwang Lin (New H3C Technologies)
Mengxiao Chen (New H3C Technologies)

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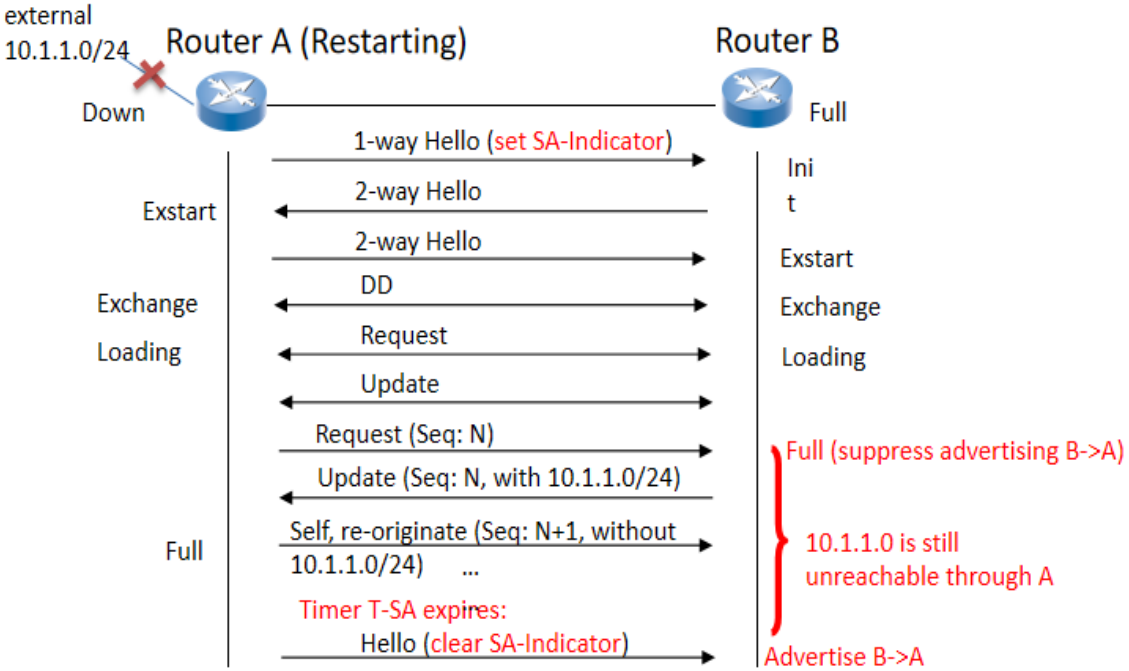
Introduction

- **Presented at IETF 116 & 117&118 meeting and requested for adoption.**
- **It is to avoid the OSPF temporary blackholes during a router’s unplanned restart.**

1) Copies of LSAs generated before restart are likely to appear "newer" than LSAs initially generated after restart.

2) The neighbors of the starting router do the route calculation using these "newer" (actually older) LSAs.

3) This may cause temporary blackholes to occur until the starting router regenerates its own LSAs.



Solution:

Router B suppress advertising of link B->A(Adjacency) until receiving the re-originated LSAs from Router A

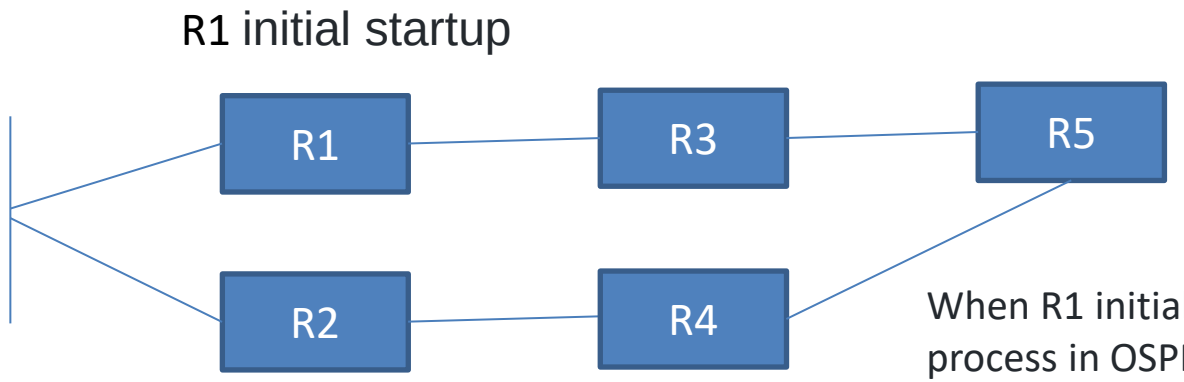
Key Points:

1. Introduce a timer to control the suppress duration

2.Using an SA-indicator to insure that the suppression is controlled by the restart router

Additional Application Scenario: Using SA-bit for Graceful Startup Process in OSPF

- Draft-draft-cheng-lsr-ospf-adjacency-suppress-03 Additional New Application Scenario:
- In the initial startup scenario, use SA suppression to completely prevent traffic from coming through.



When R1 initially starts up, the SA-bit is utilized to achieve the graceful start process in OSPF. During this initial startup, R1 does not want R5 to direct any traffic to it. Existing mechanisms like stub-router and reverse-metric do not address the scenario where traffic needs to be completely prevented from coming through.

By leveraging the SA (Suppress Adjacency) mechanism, the graceful start process in OSPF can be achieved, ensuring no traffic is routed to R1 during its initial startup.

Key Point 1--Timer

The ideal solution is to find the precise suppress duration, but this is only effective for direct neighbors.

For remote neighbors, due to the uncertainty of the flooding sequence, this duration cannot be accurately determined.

Therefore, we adopt a simple and efficient timer approach. It has several benefits:

•1)It is effective for both direct and remote neighbors

Only when both direct and remote neighbor scenarios are resolved can we prevent traffic loss in the IGP network.

2)It facilitates for forwarding plane programming

Allocate some extra time for restart router to refresh the forwarding plane, ensuring traffic is directed only after the control plane and forwarding plane are synchronized

•3)avoid the neighbor machine deadlock

Regardless of the circumstances, the timer will always end, allowing the protocol to return to normal operation

•4)valid for the whole restart router/ospf process

A single timer can control all neighbors. So,we do not need to start the timer for each interface

•5)valid for all types of lsas

As the draft described, even the router-Lsas and network-Lsas have been re-originated by the restart router, the older Type 5 lsa will still be used to do the calculation. The precise time is actually when all LSAs are refreshed, not just the Router-LSAs and Network-LSAs. Using a timer can prevent the need to maintain a list of all LSAs to obtain this precise suppress duration

Key Point 2--SA-bit

Using an SA-indicator to insure that the suppression is controlled by the restart router. The neighbors only need to respond to the restart router. The main considerations are based on the following factors:

1) Maintain consistency with other features, such as GR, NSR, stub-router, reverse-metric

Usually, if we do/not want traffic to be sent to a specific router, the controls are on the router itself, not neighbor routers. Controlling on the same side can prevent the neighbor routers from identifying different features and performing special processing when some features take effect at the same time.

2) Distinguishing interface restart and router restart

This can be easily implemented on a restarted router, but it cannot be achieved on the neighbor router.

3) Enabled by default

Since the unexpected restart can happen at any time, the feature is recommend to be enabled by default.
If this is applied on the neighbor router, it is necessary to resolve the upper concern 2), as well as ensure that the solution has no impact on other features. These two are both difficult.

4) Multi-neighbors scenario

it can prevent the function failure that occur when one certain neighbor is not configured.

Where to control: Restart or Neighbor Router?

Both are possible ideas, we suggest to determine the general direction first, and then analyze the solution on this basis

	Restart Router	Neighbor Router	Results
must maintain all the lsas which must be refresed to get the precise duration	It is complicated, so introduce timer to balance the complexity and benefits	if want to reduce the complexity, timer is also necessary.	Same
distinguish the router restart or the neighbor reestablish	can distinguish, no other affects on neighbor establish	can not distinguish, for neighbor reestablish, it is better to establish neighbor as soon as possilbe.	Restart Router win
Time control for forwarding plane or other processing time, such as differences among different types of boards/various boards.	can be adjusted according to its own hardware conditions	can not adjust	Restart Router win
normal start scenario	Not only for restart, but also for normal start.(will update this scenario in the latest version) Similar to GR start scenario in IS-IS which is absent in OSPF GR	can not resolve this scenario	Restart Router win
Reverse metric、Stub-router	can be adjusted according to its own contiditions	it is impossible to know the exact duration	Restart Router win
GR	can decide the behavior（restart or GR） by local judgment	can not distinguish restart or GR	Restart Router win
Extension Protocol or Local Behavior	Extension Protocol	Local Behavior. The affection to the neighbor state machine can be accepted? Can it be enabled default?	?

Next Steps

- Update the draft according to the comments from Acee, Thanks

1) Consistently refer to the router that restarts as the “restarting router”
2) Replace instances of “blackhole” with “traffic drop” as the former is viewed as non-inclusive
3) Optimize the description of scetion 3.2 from the perspective of neighbor routers for better understanding

- The running code has been tested in the lab.
- Requested for adoption.

Thanks