

Problem Statement of OSPF Corrupted MaxAge LSA Flushing

draft-dong-ospf-maxage-flush-problem-statement-00

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Background

- LS age field is not protected
 - LS age field is excluded from LSA checksum calculation
 - OSPF packet level checksum and authentication only protect the assembled LSU packet one hop on the wire, while cannot detect any change to LSA made by routers
- LS age field may be corrupted by router
 - Problem in some OSPF implementation
 - Problem in system timer: much faster than other routers
 - System error before the LSAs are assembled into LSU packet

Consequence of LS Age Corruption

- LS age corrupted to MaxAge
 - The corrupted MaxAge LSA will be flushed by the router, no matter self-originated or not
 - The corrupted MaxAge LSA replaces the correct LSA on other routers
 - The LSA originator advertise a new instance of the LSA (Seq#+1)
- Systematic problems could bring a lot of churn to the network
 - Severely impacts network stability and service availability

Consequence of LS Age Corruption

- LS age corrupted to a value close to MaxAge
 - If a correct LSA is received before the corrupted LSA reaches MaxAge, and the difference between the two LS age is larger than MaxAgeDiff, the correct LSA is considered more recent and replaces the corrupted LSA
 - If the corrupted LSA finally reaches MaxAge, then it is flushed and cause network churn

Requirements on Solutions

- Solution for impact mitigation
 - Reduce the impact of the problem before the root cause can be identified
 - Improve robustness of OSPF
 - Support incremental deployment
 - Does not impact the normal route convergence
- Solution for problem localization
 - Systematic problem cannot be fixed automatically
 - Operators need a mechanism to identify the corrupted router
 - A TLV similar to IS-IS POI can be helpful for TLV-based LSAs
 - Also need to consider the applicability to legacy LSAs

Next Steps

- Welcome feedbacks on
 - problem statements
 - solution requirements
- Work together on the solution drafts