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draft-ppsenak-lsr-igp-event-notification

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Overview

- Link-state protocols distribute state information
  - Existent or steady state is being advertised
- When the state does not exist anymore, it is simply removed by the advertising node
- There are certain types of events, that do not represent a steady state
  - May be useful for the network operation
- Pulse - event notification that have a limited lifetime and do not introduce a state
- Pulses may be used to advertise various types of event
  - Positive or negative in nature

Initial Use Case

- Summarization has been used traditionally to address the scale challenges associated with advertising prefix state outside of local area/domain.
- Summarization results in suppression of the individual prefix state
  - Such state is used for triggering fast-convergence mechanisms outside of the IGPs – e.g., BGP PIC Edge
- Pulse notification outside of the local area/domain when summary component prefix becomes unreachable
  - In a manner that does not leave behind any persistent state in the link-state database

Requirements for Pulse

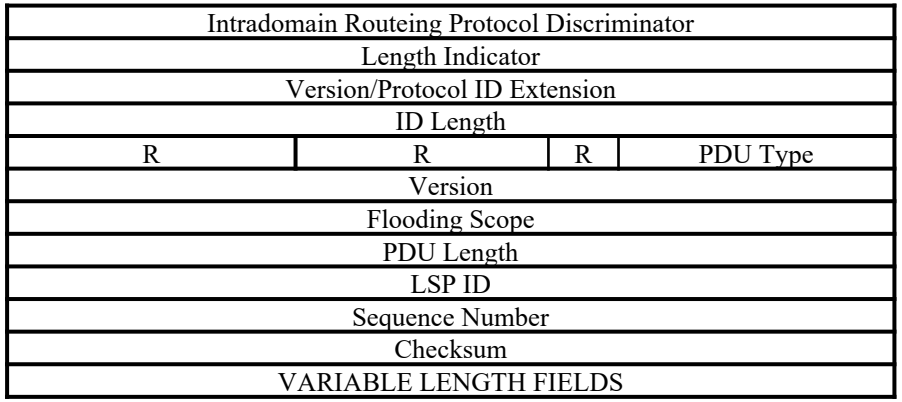
- Processing of the Pulse is OPTIONAL, decided by the receiver
- Reliability - the distribution of the Pulse MUST be reliable
- Separation from Link-State
  - Pulse advertisements are sent independently of the traditional link-state advertisement
  - Pulse arrival must not result in link-state topology update or in any route calculation
- Limited Lifetime
  - Short lived
  - No flushing/purging mechanism
  - Destroyed after their flooding procedure is complete
- Limited Retransmission
  - Only for a limited period
- Not Part of Database Sync
  - Not part of initial or post Graceful Restart database synchronization

New PDUs

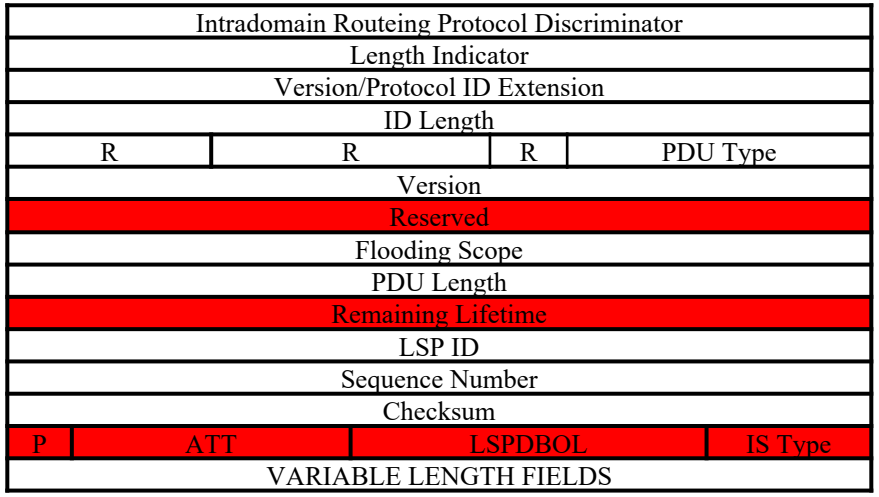
- Flooding Scoped Pulse LSP
- Flooding Scoped Pulse PSNP
- Based on RFC 7356
- Supports all flooding scopes currently defined
- No need for CSNP as Pulse LSPs are used/flooded and then discarded
- Not backwards compatible

FS-Pulse-LSP

FS-Pulse-LSP Header



FS-LSP Header



Red fields are omitted from FS Pulse LSP Header

FS-Pulse-PSNP

FS-Pulse-PSNP Header

Intradomain Routeing Protocol Discriminator			
Length Indicator			
Version/Protocol ID Extension			
ID Length			
R	R	R	PDU Type
Version			
Reserved			
Flooding Scope			
PDU Length			
Source ID			
VARIABLE LENGTH FIELDS			

FS-PSNP Header

Intradomain Routeing Protocol Discriminator			
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PDU Length			
Source ID			
VARIABLE LENGTH FIELDS			

Pulse LSP Entry TLV

LSP ID (ID Length+2)
Sequence Number(4)
Checksum(2)

LSP Entry TLV

Remaining Lifetime(2)
LSP ID (ID Length+2)
Sequence Number(4)
Checksum(2)

Red field is omitted from Pulse LSP Entry TLV

FS-LSP Update Process

- Separate instance of the Update Process for each scope supported for FSP-LSPs (Analogous to RFC7356)
- The circuit(s) on which FSP-LSPs are flooded is limited to those circuits that are participating in the given scope.
- FSP-LSPs are not retained beyond the minimum time needed to process the information and flood it.
- Flooding of an FSP-LSP on a circuit ceases after a configurable number of retries.
  - 3 by default
- FSP-LSPs SHOULD be retained in the FSP Scope Specific LSDB for ZeroAgeLifetime (60 seconds).
  - to minimize the possibility of reprocessing a previously received FSP-LSP

FSP-LSP Generation Procedures

- Originator of FSP-LSPs MUST remember the last sequence number used for a given FSP-LSP
  - Increment the sequence number when generating a new version.
- Originator utilizes the "next" FSP-LSP ID each time new pulse information needs to be advertised
  - if the most recent FSP-LSP ID used was A-00.n, the next set of pulse information SHOULD be advertised using FSP-LSP.ID A-00.n+1.
  - This minimizes the possibility of confusion if other routers in the network have not yet removed A-00.n from their LSPDB.

FSP-LSP Acknowledgement

- Determining whether a received FSP-LSP is newer follows the rules defined for traditional LSPs
- Received FSP-LSPs which are either newer or the same as an existing entry in the LSPDB are acknowledged using FSP-PSNPs.
- Received FSP-LSPs which are older than existing entries in the LSPDB are ignored.

IS-IS Summary Component Reachability Loss Pulse TLV

- Summarization is done at IS-IS L1/L2 router or an IS-IS ASBR
- When router loses previously reachable component of the summary prefix inside the area or domain, it MAY originate the SCRLP TLV
- The IS-IS SCRLP TLV MAY be leaked between levels
- IS-IS SCRLP TLV MUST NOT be leaked inside the area if the summary prefix carried in IS-IS SCRLP TLV is advertised from such area by L1/L2 router.
- When the router receives the SCRLP TLV it MAY choose to inform the BGP component on the router
  - BGP component MAY trigger BGP PIC

Next Steps …

- Comments are welcome