

# IS-IS Multi-Flooding Instances

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# Outline

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# Motivations and Goals

- **Observation:**
  - Burdening IS-IS: with the increasing use the mechanism to disseminate application information.
  - Potential Impacts: impact intra-domain routing convergence and the stability of the IS-IS routing.
  - Information carried in GENINFO TLVs should be associated with information carried in other is-is advertisements or with information carried in other IS-IS instances [draft-bowers-lsr-isis-gen-info-clarifications-00].
- **Goals:** presents a alternative flooding mechanism which isolates dissemination of routing topology, TE information and other types of application information into Multiple Flooding Instances (MFIs) within the zero instance to eliminates the impact of application information flooding on the routing convergence and stability.
  - Specify MFI Identifier TLV
  - Specify Update Process Operation
  - Specify Interoperability Consideration
- **Why?** Important to be presented, because:
  - Provide a alternative solution to isolate the effects of flooding and processing of non-routing information on the routing convergence and stability.
  - Minimize the complexity of implementation and the cost of adjacencies maintenance due to MFIs share a common adjacencies and a single LSDB.

# IS-IS Multi-flooding Instances (MFIs)

- **MFIs Definition:**
  - An extension to IS-IS to allow one standard instance of the protocol to support multiple Update process associated operating on a single LSDB.
  - Each update process is associated with a unique MFI.
  - Multiple flooding instances share a common adjacencies.
  - Due to different information has various requirements on the flooding rate, each flooding instance should be given the MFI-specific priority and flooding parameters.
- **MFI Identifier (MFI-ID) TLV Format:**
  - The protocol extension includes the MFI-ID TLV in each Level 1/Level 2 IS-IS LSPs and SNPs originated by an Intermediate System.
  - Introduced to uniquely identify an IS-IS flooding instance and the associated Update Process.

			No. of octets
+-----+-----+			
	Type	Length	2
+-----+-----+			
	MFI-ID		2
+-----+-----+			

# IS-IS Multi-flooding Instances (MFIs)

## Update Process Operation:

- Each Level 1/Level 2 Link State PDU associated with a specific MFI carries flooding information belonging to the specific MFI.
- And Level 1/Level 2 PSNP and Level 1/Level 2 CSNP containing information about LSPs that transmitted in a specific MFI are generated to synchronize the information propagated in the specific MFI.
- In each MFI, update parameters can be customized in dependent on the requirements on the flooding rate of different information.
- MFI-ID#0 is reserved to disseminate the routing topology information. Non-zero MFIs omission of routing calculation.

MFI	LSPs/SNPs	Information	Priority and Update Parameters
MFI #0	Level-1 LSP/PSNP/CSNP	Routing Topology Information	High priority
	Level-2 LSP/PSNP/CSNP		MaxAge#0, ZeroAgeLifetime#0, maximum LSP Generation Interval#0, minimum LSP Generation Interval#0, minimum LSP Transmission Interval#0, Complete SNP Interval#0, partial SNP Interval#0
MFI #1	Level-1 LSP/PSNP/CSNP	TE Information	Medium priority
	Level-2 LSP/PSNP/CSNP		MaxAge#1, ZeroAgeLifetime#1, maximum LSP Generation Interval#1, minimum LSP Generation Interval#1, minimum LSP Transmission Interval#1, Complete SNP Interval#1, partial SNP Interval#1
MFI #2	Level-1 LSP/PSNP/CSNP	Application Information	Low priority
	Level-2 LSP/PSNP/CSNP		MaxAge#2, ZeroAgeLifetime#2, maximum LSP Generation Interval#2, minimum LSP Generation Interval#2, minimum LSP Transmission Interval#2, Complete SNP Interval#2, partial SNP Interval#2

Example

# IS-IS Multi-flooding Instances (MFIs)

- Interoperability Considerations:
  - Scenario #1: some routers that do not support MFI,
    - a. Recommend that all MFIs in an IS-IS protocol instance share one LSP Number space.
    - b. Thus MFI can coexist with routers that do not support MFI.
    - c. If routers that do not support MFI receive the LSPs and SNPs encoding MFI-ID TLV, then routers SHOULD ignore the MFI-ID TLV and continues processing other TLVs.
    - d. LSP ID is used to uniquely identify an LSP.
  - Scenario #2: all routers in the entire routing domain support MFI
    - a. Recommend that each MFI can has its own LSP Number space.
    - b. Each MFI can have a maximum of 256 LSPs.
    - c. Both LSP ID and MFI are used to uniquely identify an LSP.

# MFI vs. MI

	IS-IS MI	IS-IS MFI
Number of IS-IS protocol instance	Multiple protocol instance (zero instance and non-zero instances)	Within zero instance
Number of Adjacencies	instance-specific adjacencies (i.e. each instance will have a separate set of adjacencies)	Share a common adjacencies
Number of LSDB	Each Update Process is associated with a topology and a unique topology-specific LSDB.	Share a single LSDB
Flooding Parameters	Instance-specific flooding parameters	Customized for each MFI depending on flooding information

- **Benefits:**
  - MFI is a lightweight extensions to IS-IS protocol.
  - MFI is beneficial to decrease the complexity of implement.
  - MFI is beneficial to minimize the cost of adjacencies maintenance.

# Next Steps

- Comments and questions are welcome, and appreciate.
- Refine the draft according to comments and suggestions.
- Cooperation is welcome!

Thank You !