

# Flooding Scope PDUs

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# What Problems are being addressed

## Reliable Link Scoped Flooding

- Efficient/Reliable flooding of information only of interest to routers on a given link

- Scalable

- TRILL AF information

## Extending LSP Space

- Existing solution (RFC 5311) is backwards compatible but...

  - Requires multiple system ids

  - Restricts TLV advertisements

- New solution removes restrictions – but not backwards compatible

## Support of New Flooding Scopes

- Domain-wide Flooding Scope

- More flexible/scalable than Router Capability TLV

# Overview

Introduce a new LSP with flooding scope encoded in the LSP header (also new CSNP/PSNP)

Minimize the use of limited PDU type space

Define new flooding scopes

LSPs for each scope are kept in a scope specific LSDB

Not backwards compatible

# FS-LSP

## Standard LSP Header

|  |     |         |          |
|--|-----|---------|----------|
| Intradomain Routing Protocol Discriminator |     |         |          |
| Length Indicator                           |     |         |          |
| Version/Protocol ID Extension              |     |         |          |
| ID Length                                  |     |         |          |
| R  | R   | R       | PDU Type |
| Version                                    |     |         |          |
| Reserved                                   |     |         |          |
| Maximum Area Addresses                     |     |         |          |
| PDU Length                                 |     |         |          |
| Remaining Lifetime                         |     |         |          |
| LSP ID                                     |     |         |          |
| Sequence Number                            |     |         |          |
| Checksum                                   |     |         |          |
| P  | ATT | LSPDBOL | IS Type  |
| VARIABLE LENGTH FIELDS                     |     |         |          |

## FS- LSP Header

|  |     |         |          |
|--|-----|---------|----------|
| Intradomain Routing Protocol Discriminator |     |         |          |
| Length Indicator                           |     |         |          |
| Version/Protocol ID Extension              |     |         |          |
| ID Length                                  |     |         |          |
| R  | R   | R       | PDU Type |
| Version                                    |     |         |          |
| Reserved                                   |     |         |          |
| Flooding Scope                             |     |         |          |
| PDU Length                                 |     |         |          |
| Remaining Lifetime                         |     |         |          |
| LSP ID                                     |     |         |          |
| Sequence Number                            |     |         |          |
| Checksum                                   |     |         |          |
| P  | ATT | LSPDBOL | IS Type  |
| VARIABLE LENGTH FIELDS                     |     |         |          |

R| Scope (1 – 127)

**Flooding Scope (8 bits)**

|               |
|---------------|
| Source ID     |
| Pseudonode ID |
| LSP Number    |

ID Length  
1 Octet  
1 Octet

**Standard Format**

|                     |
|---------------------|
| Source ID           |
| Extended LSP Number |

ID Length  
2 Octets

**Extended Format**

# FS-CSNP

## Standard CSNP Header

|   |   |   |          |
|---|---|---|----------|
| Intradomain Routeing Protocol Discriminator |   |   |          |
| Length Indicator                            |   |   |          |
| Version/Protocol ID Extension               |   |   |          |
| ID Length                                   |   |   |          |
| R   | R | R | PDU Type |
| Version                                     |   |   |          |
| Reserved                                    |   |   |          |
| Maximum Area Addresses                      |   |   |          |
| PDU Length                                  |   |   |          |
| Source ID                                   |   |   |          |
| Start LSP ID                                |   |   |          |
| End LSP ID                                  |   |   |          |
| VARIABLE LENGTH FIELDS                      |   |   |          |

## FS- CSNP 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                                   |   |   |          |
| Start LSP ID                                |   |   |          |
| End LSP ID                                  |   |   |          |
| VARIABLE LENGTH FIELDS                      |   |   |          |

R| Scope (1 – 127)

**Flooding Scope (8 bits)**

# FS-PSNP

## Standard PSNP Header

|  |   |   |          |
|--|---|---|----------|
| Intradomain Routing Protocol Discriminator |   |   |          |
| Length Indicator                           |   |   |          |
| Version/Protocol ID Extension              |   |   |          |
| ID Length                                  |   |   |          |
| R  | R | R | PDU Type |
| Version                                    |   |   |          |
| Reserved                                   |   |   |          |
| Maximum Area Addresses                     |   |   |          |
| PDU Length                                 |   |   |          |
| Source ID                                  |   |   |          |
| VARIABLE LENGTH FIELDS                     |   |   |          |

## FS-PSNP Header

|  |   |   |          |
|--|---|---|----------|
| Intradomain Routing 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                     |   |   |          |

U| Scope (1 – 127)

**Flooding Scope** (8 bits)

U = 1 => Flooding Scope Not Supported

Used to suppress retransmission of unsupported scopes  
on Pt-Pt circuits

# Announcing Supported Scopes

**Announcement is optional – useful to detect misconfigs**

**Does NOT affect adjacency formation**

**Announce list of supported scopes in IIHs**

**Include:**

- Circuit scopes supported on that circuit
- Non-circuit scopes supported on that circuit
- L1 IIH includes L1 scopes and domain scopes
- L2 IIH includes L2 scopes and domain scopes
- Pt-Pt IIH includes scopes for the levels supported on that circuit as well as domain scopes

## **New TLV**

```
+-----+
|R| Supported Scope | 1
+-----+
:
+-----+
|R| Supported Scope | 1
+-----+
```

# Update Process Operation

One instance of Update Process for each supported scope

Normal operation – but operates only on circuits supporting the given scope

One LSDB per scope

## Point-to-Point Circuits

Receipt of PSNP w U bit set in scope suppresses retransmission of LSPs w that scope

Only occurs in mismatched configuration

## Broadcast Circuits

No changes to DIS election

No Scope specific DIS

Scopes which are not level specific are flooded by both L1 and L2 (if supported)

# Scope Types

## Circuit Scopes

- Local to a given circuit

- Receivers do NOT flood on any other circuit

- L1/L2 specific

## L1/L2 Scope

- Flooding domain identical to existing L1/L2 LSPs

## Domain-wide Scope

- Flooded on all circuits

- Check reachability using Router ID TLVs

# Deployment Considerations

New PDUs will not be recognized by legacy implementations

Legacy implementations likely to treat unknown PDU type as an error

Partial deployment is possible

- Only routers within a given flooding scope have to support the new PDUs
- Only routers within a given flooding scope have to support that flooding scope
- Use of U bit in PSNP helps w partial deployment – but behavior may be unpredictable