

# OSPF-TE Extensions for Flex-grid

**draft-dhillon-ccamp-super-channel-ospfte-ext-02**

**IETF 83 - Paris, France**

**March 25 - 31, 2012**

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# Agenda

- Changes since IETF-82
- Open Issues
- Next Steps

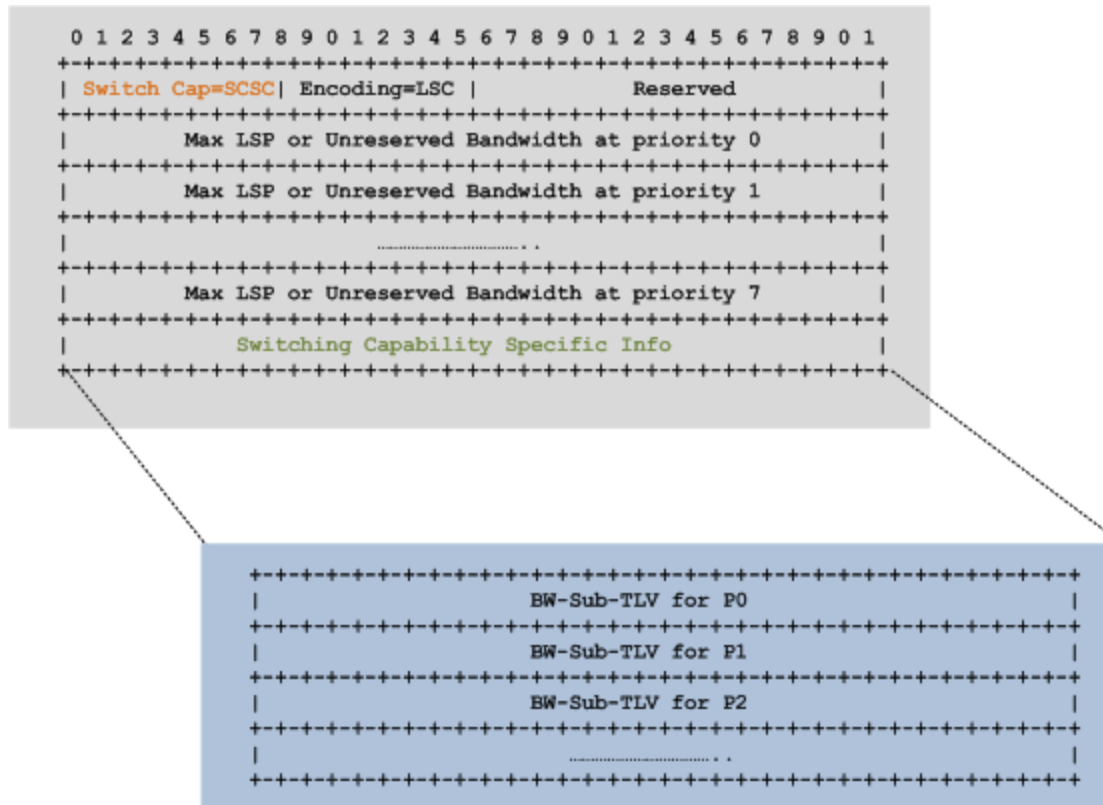
# Changes

- Ver-02 submitted in Nov'11
- Slight modifications to BW sub-TLV
  - Re-arranged few fields
  - Reduced size of priority field from 8-bit to 3-bit
  - Added descriptions for various fields
- Added examples
  - Modifications to go with new TLV format

# Proposal - recap

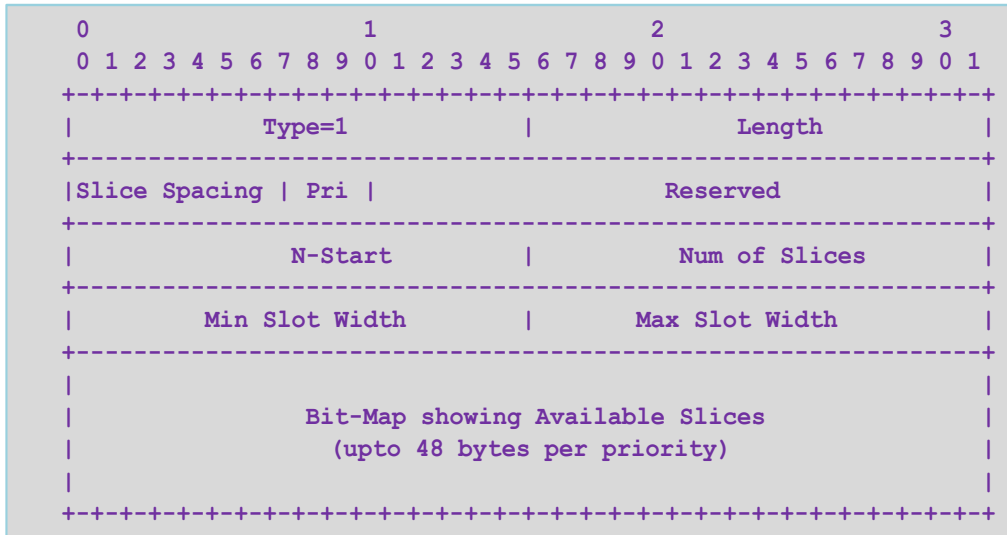
- Simple extensions to ISCD [RFC 4202]
  - New Switching Capability
  - Flex-Grid extensions in SCSl
- Flex-Grid extensions summary
  - Divide C-band in to ‘Slices’ of certain width
  - Advertise ‘Slice’ availability
  - Support for BW advertisement per priority
  - Support for Min & Max ‘Frequency Slot’ use per LSP

# Proposal: ISCD/SCSI formats



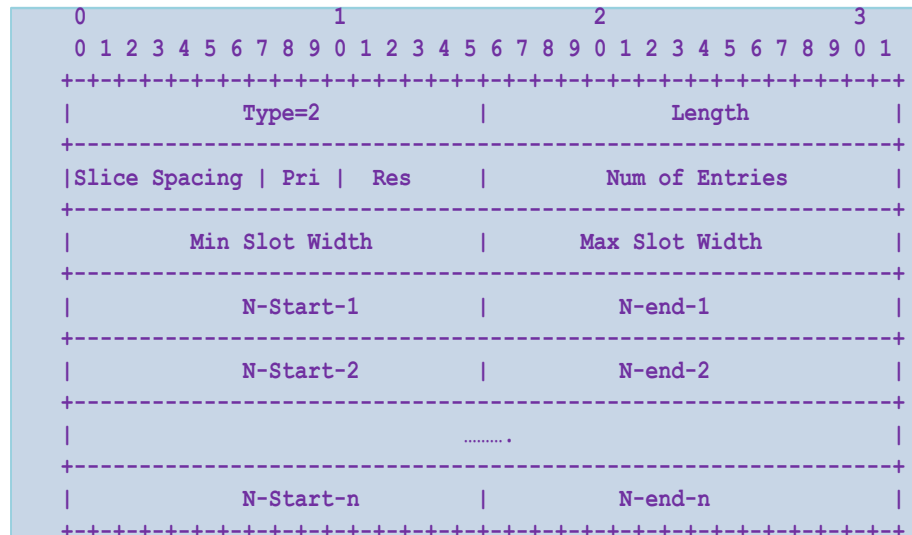
- Switching Capability = Super Channel Switching Capable
- SCSI to contain one or more BW-sub-TLVs (Type=1 or Type=2)

# Proposal: BW-sub-TLV(s)



Sub-TLV for Bit-map option

Sub-TLV for List or Range option



# Open issues

- Terminology clarifications
  - Framework document submitted with definitions & use cases
- WG agreement on Control Plane requirements
  - Alignment with ITU docs on data plane aspects
- Maximum LSP BW encoding in ISCD
  - Two options being looked at:- Encode based on Max Slot width & Modulation or Set to zero.

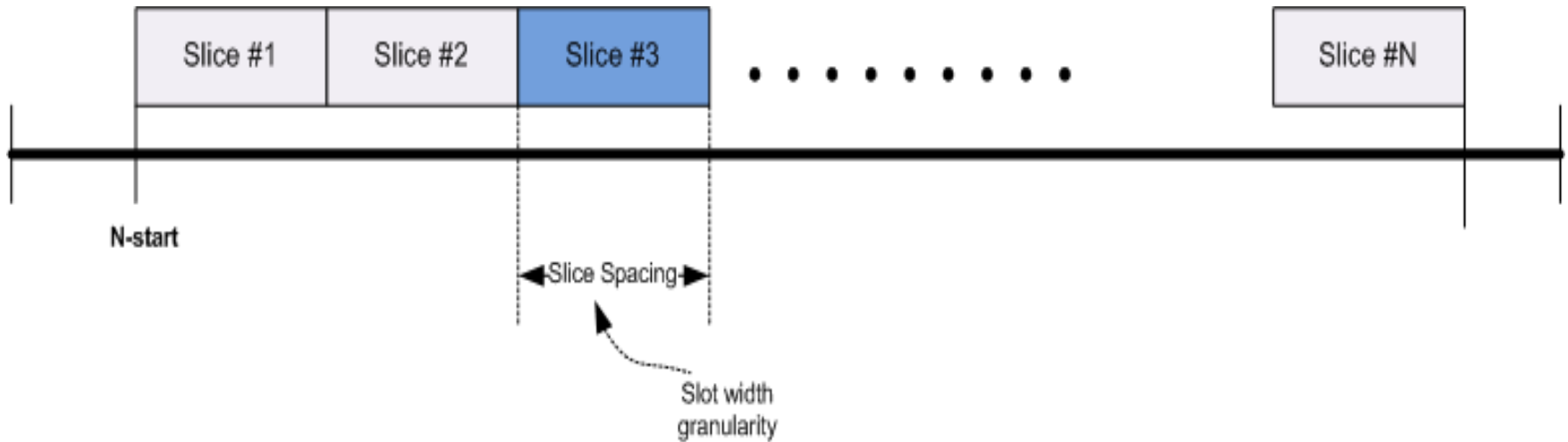
# Next Steps

- Discuss
  - Framework,
  - Requirements,
  - Use cases,
  - Merge options with other contributions



Backup

# Slicing the C-band Spectrum



- N-Start identifies start of usable spectrum supported by the node advertising slices
- Slice Spacing is Single Slice granularity (e.g. 12.5GHz)
- The usable spectrum is divided in to n-slices & slice availability is advertised in BW-sub-TLV
- Slice Numbering anchored @ N-Start

# **Super-Channel Optical Parameters GMPLS Routing Extensions**

**draft-hussain-ccamp-super-channel-param-ospfte-00.txt**

**IETF 83 - Paris, France**

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# Agenda

- Motivation
- Extensions Summary
- TLV Summary
- Use Case
- Open Issues
- Next Steps

# Motivation

- Coexistence of super-channels using different modulation formats
- Adjacent super-channels may affect each other detrimentally
- It is desirable to evaluate the mutual impact of the existing and new super-channels on each other's quality of transmission

# Extensions Summary

- This draft defines GMPLS routing extensions to advertise the super-channel parameters (defined in the draft-hussain-ccamp-super-channel-param-sig) via OSPF-TE link LSA using a new Super-Channel sub-TLV

# TLVs Summary

- This draft defines following TLVs
  - A Super-Channel TLV
    - Super-Channel In-Use Slices sub-TLV
    - Super-Channel Carriers sub-TLV
      - (see draft-hussain-ccamp-super-channel-param-sig)
- The Super-Channel sub-TLV is
  - Advertised in the OSPF-TE link LSA under the under the SCSI field of the ISCD using Super-Channel- Switch-Capable (SCSC) value (see draft-dhillon-ccamp-super-channel-ospfte-ext)





# Super-Channel In-Use Slices sub-TLV Format

```

 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+
|           TLV Type           |           Length           |
+-+-+-+-+-+-+-+
| Super-Channel Id           | Grid | S.S. | PRI | Reserved |
+-+-+-+-+-+-+-+
| n_start_1 (spectral slot 1) | n_end_1 (spectral slot 1) |
+-+-+-+-+-+-+-+
| n_start_2 (spectral slot 2) | n_end_2 (spectral slot 2) |
+-+-+-+-+-+-+-+
|
|           More entries           |
~
~
+-+-+-+-+-+-+-+
| n_start_n (spectral slot n) | n_end_n (spectral slot n) |
+-+-+-+-+-+-+-+

```

# Use Case

- The slice in-use information enables source nodes to apply added CSPF constraints to:
  - Group super-channels with different modulation formats in different bands (slice ranges)
  - Group super-channels with same bit-rate in a band while separating with guard band from super-channels with different bit-rate.
- Allows efficient network utilization by avoiding the worst-case OSNR penalty while preserving desired quality of transmission of the existing super-channels

# Open issues

- Terminology clarifications
  - Framework document submitted with definitions & use cases
- WG agreement on Control Plane requirements
  - Alignment with ITU docs on data plane aspects

# Next Steps

- Requesting for review and comments
- Discuss merge options with other contributions