

# OSPF-TE Extensions for MLNMRN based on OTN

draft-rao-ccamp-mlnmrn-otn-ospfte-ext-00

Rajan Rao ([rrao@infinera.com](mailto:rrao@infinera.com))

Khuzema Pithewan ([kpithewan@infinera.com](mailto:kpithewan@infinera.com))

Ashok Kunjidhapatham ([akunjidhapatham@infinera.com](mailto:akunjidhapatham@infinera.com))

IETF-85 Nov 5<sup>th</sup> 2012

# OSPF-TE extensions for OTNv3 support

(draft-ietf-ccamp-gmpls-ospf-g709v3)

ISCD Format as defined by the extension requires available bandwidth for a signal Type + Hierarchy in a TLV in SCSI area. SCSI can have multiple of these TLVs.

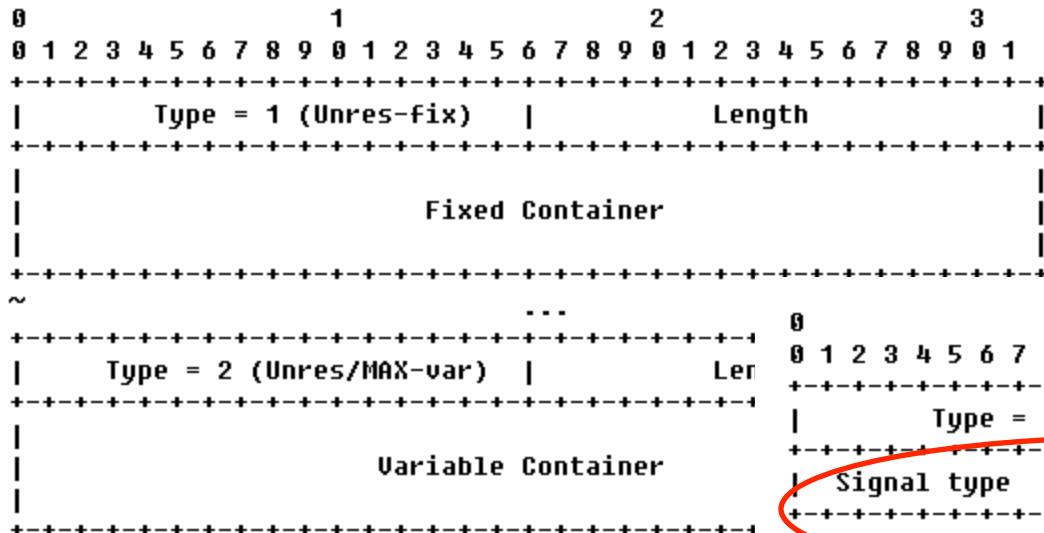


Figure 3: SCSI format

0	1	2	3
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			
Type = 1 (Unres-fix)	Length		
+	+	+	+
Fixed Container			
~			
+	+	+	+
	...		
+	+	+	+
Type = 2 (Unres/MAX-var)	Len		
+	+	+	+
Variable Container			
+	+	+	+

A red oval highlights the following fields in the Variable Container header:

- Signal type
- Num of stages
- T|S| TSG
- Res
- Priority

Below the Variable Container header, the stages are detailed:

- Stage#1
- ...
- Stage#N
- Padding

Each stage contains an Unres ODUj at Prio value (0 through 7).

Figure 4: Bandwidth TLV - Type 1 -

# RFC 6001 : GMPLS Protocol Extensions for MLN/MRN

RFC 6001 defines IACD to advertize the capacity available between 2 ISCDs (belong to 2 different layer/regions).

0	1	2	3
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
++	++	++	++
Lower SC	Lower Encoding	Upper SC	Upper Encoding
++	++	++	++
	Max LSP Bandwidth at priority 0		
++	++	++	++
	Max LSP Bandwidth at priority 1		
++	++	++	++
	Max LSP Bandwidth at priority 2		
++	++	++	++
	Max LSP Bandwidth at priority 3		
++	++	++	++
	Max LSP Bandwidth at priority 4		
++	++	++	++
	Max LSP Bandwidth at priority 5		
++	++	++	++
	Max LSP Bandwidth at priority 6		
++	++	++	++
	Max LSP Bandwidth at priority 7		
++	++	++	++
	Adjustment Capability-specific information		
++	(variable)		
++	++	++	++

# Problem for multi-layer technology like OTN w.r.t. MRN

- RFC 6001 assumes SwitchCap and Encoding type is good enough to represent the bandwidth associated with an interface (i.e. ISCD)
- While OTN extensions as defined today, captures more than one layer in one ISCD.
- IACD must associate to one of the layer in OTN ISCD.

# What is required to connect OTN Layer with other region(s)?

- A Layer in OTN
  - SwCap=OTN-TDM
  - Encoding=G.709 ODUK
  - Signal Type
  - Hierarchy
  - TSG
  - Terminating/Switching
- An IACD must carry above information to unambiguously identify a layer in OTN MultiLayer interface

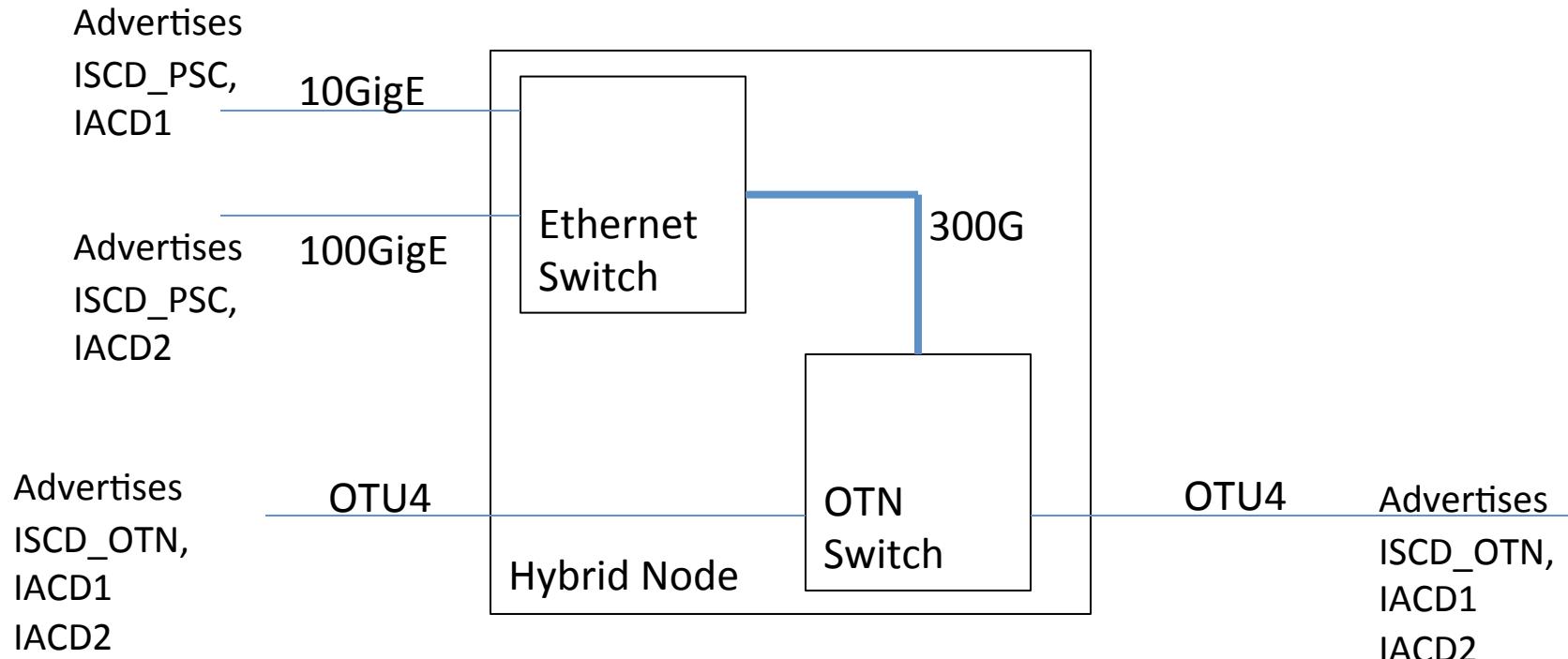
# How do we connect

Considering current definition of the SCSI for OTN extension for OSPF, IACD's Adjustment Capability specific information for OTN needs to carry all the information to correctly identify the layer in the OTN TE Link ISCD.

IACD (As defined by RFC 6001)						
Adjustment Capability-specific information for OTN						
<pre>+-----+-----+-----+-----+-----+-----+-----+   Signal type   Num of stages   T S  TSG   Res   Stage#1     +-----+-----+-----+-----+-----+-----+-----+   Stage#2   ...   Stage#N     Padding     +-----+-----+-----+-----+-----+-----+</pre>						

New  
Proposal

# Example



## IACD1

Upper SwitchCap/EncTyp : PSC/Ethernet  
Lower SwitchCap/EncType : OTN-TDM/G.709 ODUk  
SCSI : SignalType+Hierarchy ODU2-ODU4 (For 10GigE)

## IACD2

Upper SwitchCap/EncTyp : PSC/Ethernet  
Lower SwitchCap/EncType : OTN-TDM/G.709 ODUk  
SCSI : SignalType+Hierarchy ODU4(For 100GigE)

# Next Steps

- Workgroup feedback is welcome