

Considerations on Optical 400GbE DMT

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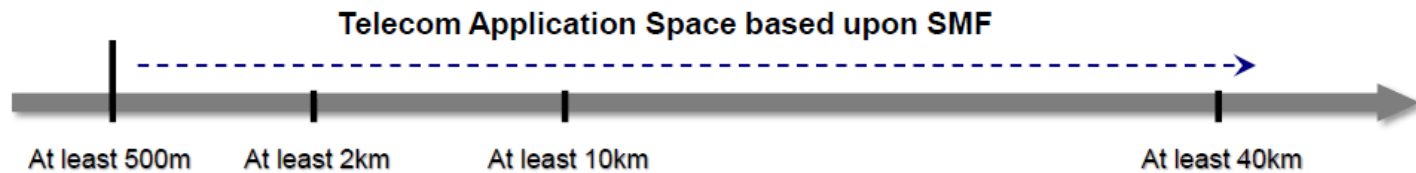
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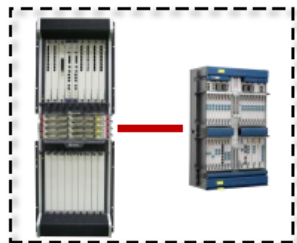
Background

- The long reach applications (10km, 40km) of the client side interface of transport are strongly preferred for first target of 400GbE.
- We discuss the candidate of reasonable solution for the applications.

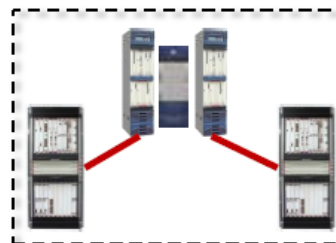
Motivation and Application Space of 400GbE SMF



Connections between IP Core Routers and OTN



Connections between IP Routers

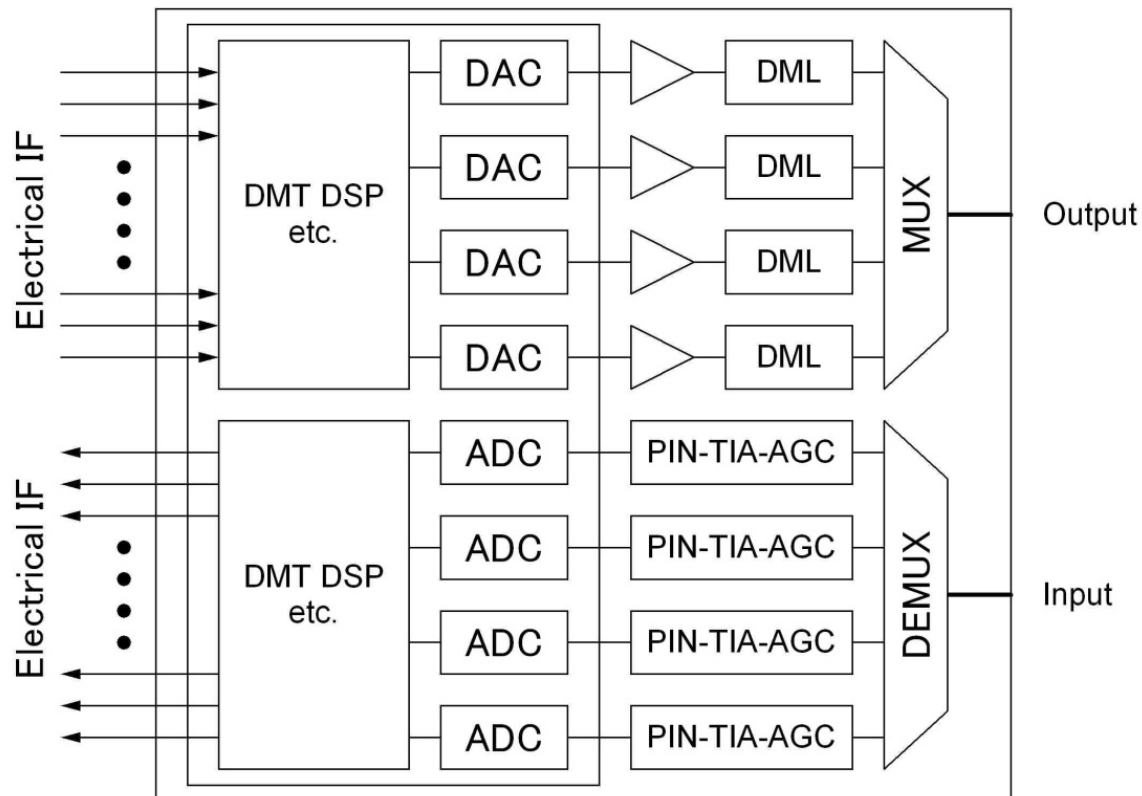


(Ref.: song_x_400_01_0913.pdf)

- Telecom application is an important domain for the first adoption of 400GbE.
 - ✓ Connections between IP Routers suggest an SMF distance objective of 10km, and additionally 40km for some of the Metro applications. Duplex fiber solutions are regarded necessary for both applications.
 - ✓ Connections between IP Core Routers and OTN equipments, suggest SMF distance objective of 2km. Also in this case Duplex fiber solutions are regarded necessary.
- So we definitely need an SMF distance objective of 10km.
- If we can generate a specification for at least 2km which enables a significantly lower cost solution than for 10km then a 2km SMF objective should be added.

Configuration for Optical 400GbE DMT

- Combination of WDM technologies with advanced modulation format (DMT; Discrete Multi-Tone modulation)
 - Duplex fiber
 - Reduction of required bandwidth due to high spectral efficiency
 - Only 4 channels as below



Advantage of Optical 400GbE DMT

■ Transmission characteristics

- for 10 km:
 - We have already shown the feasibility of optical DMT.
- for 40 km:
 - Under discussion of its feasibility with improvement factors as below
 - Characteristic enhancement of DAC and ADC
 - Optimization of receiver amplifier parameter
 - Use of electrical compensation

■ Cost and size

- Optical DMT has the possibility of reduction of the cost and size because we can use the optical devices developed for 100GBASE-LR4.
 - We can apply the integrated devices for 4ch. TOSA and ROSA.

Summary

- Transceiver configuration is shown for optical 400GbE DMT with WDM
 - Reduction of size and cost because of reduction the number of optical devices
- DMT can provide a wide range of optical reach with improvement factors.

Thank you