Wavelength Consideration of BiDi 40km for 50Gb/s

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Outline

- Summary of wavelengths in the last conference
- Criteria of wavelength selection
- Recommendation

Summary of wavelengths in the last conference

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Strawpoll #7

• Move to use the following wavelengths as a starting point for our 9 link types.

Down/Up		10km		20km		40km
10Gb/s NRZ		1330/1270nm ± 10nm		1330/1270nm ± 10nm		1330/1270nm ± 10nm
25Gb/s NRZ		1330/1270nm ± 10nm		1310/1290nm ± 8nm		1310/1290nm ± 8nm
50Gb/s PAM4		1330/1270nm ± 10nm		1310/1290nm ± 8nm		1310/1290nm ± 8nm

– M: Yuanqiu Luo S: Ray Nering
– Technical >=75%
– Yes: 7 No: 0 Abs: 2
– Motion result: Passes

Criteria of wavelength selection

- PAM4 signals are more sensitive to dispersion than NRZ signals. Therefore, it is necessary to select a wavelength close to the zero-dispersion window at 1310 nm.
- For 50G, PAM4 modulation is preferred, and both the downstream and upstream wavelengths need to be chosen such that the dispersion penalty is sufficiently small.
- The Guard band is relatively large, with good isolation, which ensures that the optical filter can be implemented easily.
- Select the standard wavelength as close as to the standard LWDM/CWDM band, so that it can share the same optics with other physical layer devices such as 100GBASE-LR4, 200GBASE-LR4, etc.

Recommendation

As shown in the following Figure, we recommend the upstream wavelength is 1292.21nm～1296.59nm, the downstream wavelength is 1306.29nm～1310.19nm.

Advantages:
1.) Is very close to the LWDM normal wavelength assignments;
2.) Upstream is entirely in negative dispersion region;
3.) Guard band is 9.7nm, which has good isolation and can be helpful for optical filter to be easily implemented.

Channel		TX wavelength range(nm)		RX wavelength range(nm)
Upstream		1292.21～1296.59		1306.29～1310.19
Downstream		1306.29～1310.19		1292.21～1296.59

Thanks!