

Wavelength Support

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Supporters

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Review of Prevalent Channel Frequency Ranges and Spacings*

	OIF 400ZR		ITU-T G.698.1	ITU.T G.698.2	Cablelabs	OpenROADM
Spacing (GHz)	75	100	100	100	100	50
Min ch (THz)	191.375	191.4	191.5	191.5	191.3	191.35
Max ch (THz)	196.1	196.1	196.2	196.2	196.2	196.1
Channel Count	64	48	48	48	50	96

* Data for ITU-T G.698.1, ITU-T G.698.2, Cablelabs, and OpenROADM per deandrea_3ct_01a_0319. Data for OIF 400ZR from OIF 5/19/19 Liaison to IEEE 802.3.

Task Force Consideration of Channel Frequency Ranges and Spacings

- Strawpoll #7, Nov 2018 – For the 400 GbE – 80km objective I would support the following channel spacing (Chicago Rules):
75 GHz – 0 **100 GHz – 51** Need more information – 4 Abstain – 9
- Strawpoll #8, Nov 2018 – For 100 GbE 80km objective I would support the following channel spacing (Chicago Rules):
50 GHz – 6 75 GHz – 0 **100 GHz – 37** Need more information – 11
Abstain - 9
- **Motion #6, Mar 2019 – 100 GHz** spacing selected for 100 GbE and 400 GbE objectives
Approved
- Strawpoll #1, Mar 2019 – Support for 191.3/196.1
Y: 12 N: 1 Need info: 17 Abstain: 5
- Strawpoll #2, Mar 2019 – Support for 191.5/196.1
Y: 11 N: 0 Need info: 10 Abstain: 9

Observations

- Preference for a single specification, i.e. PHY, for each rate regardless of channel frequency (wavelength)
 - Same Tx specification
 - Same Rx specification
- Preference for a single black-link specification for each rate regardless of channel frequency (wavelength)
- For DWDM links, these three key characteristics need to match:
 - Tx channel frequency (wavelength)
 - Rx local-oscillator frequency (wavelength)
 - Port frequency (wavelength) of any mux/dmux within the link
- DWDM links have traditionally required configuration as noted above
 - Preserve approach in IEEE 802.3
 - No optical auto-negotiation has yet been specified in IEEE 802.3

PMD Channel Frequency (Wavelength) MGMT

- Add MDIO capability registers to Clause 45 to indicate channel frequency (wavelength) of the PMD implementation
- Allow that the reported capability can be a subset of the overall specification
 - Support a tunable solution covering the entire channel frequency (wavelength) range and spacing
 - Support a tunable solution covering only a portion of the specified channel frequency (wavelength) range and spacing
 - Support a solution providing a single channel frequency (wavelength)
- Add MDIO control register to Clause 45 to configure the channel frequency (wavelength) of the PMD

Black-Link Consideration

- Single black-link specification (one set of optical parameters) that defines the DWDM channel, independent of the channel frequency (wavelength)
- Allow that the implementation capability can be a subset of the overall specification
 - Support entire channel frequency (wavelength) range and spacing
 - Support only a portion of the specified channel frequency (wavelength) range and spacing

Proposal for 100G and 400G

- The channel plan – channel frequency (wavelength) range and spacing
 - 48 frequency (wavelength) channels
 - Spacing: 100 GHz (Already decided by Motion #6 of March 2019 meeting.)
 - Range: 191.5 THz to 196.2 THz (consistent with ITU G.698.2)
- Single PHY specification (one PMD name and one set of optical parameters) operating on one of the up to 48 channels
- Single black-link specification (one set of optical parameters) that defines the DWDM channel, independent of the channel frequency (wavelength)
- Add appropriate MDIO registers to Clause 45 as follows:
 - Channel frequency (wavelength) capability registers (48 bits in total) to allow a PMD to advertise the frequency (wavelength) channels it supports
 - Channel frequency (wavelength) control register (6 bits in total) to allow a PMD to be configured to operate at one of the up to 48 wavelength channels it may support
- Define a “User Configured DWDM Link”
 - A DWDM link configured to match the Optical Tx and Optical Rx of the DWDM PHY to the DWDM Channel

Note: New concern regarding cost of maximum frequency

Thank you