

NG-EPON Wavelength plan

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Considerations of wavelength plan

Coexistence

- NG-EPON coexists with 10G-EPON , and no need to coexists with EPON

Optical component should be low cost

- No DWDM, no Tunable
- Use DML for transmitter

Transmission distance

- At least 20km

Dispersion mitigation

- Prefer O band

Migration

- Smooth migration must be supported

NG-EPON Wavelength Plan option 1

-25G Single Channel Wavelength Plan

Using CWDM Wavelength: Ds: 1344.5 to 1357.5 nm Us: 1264.5 to 1277.5 nm

Coexists with 10G-EPON

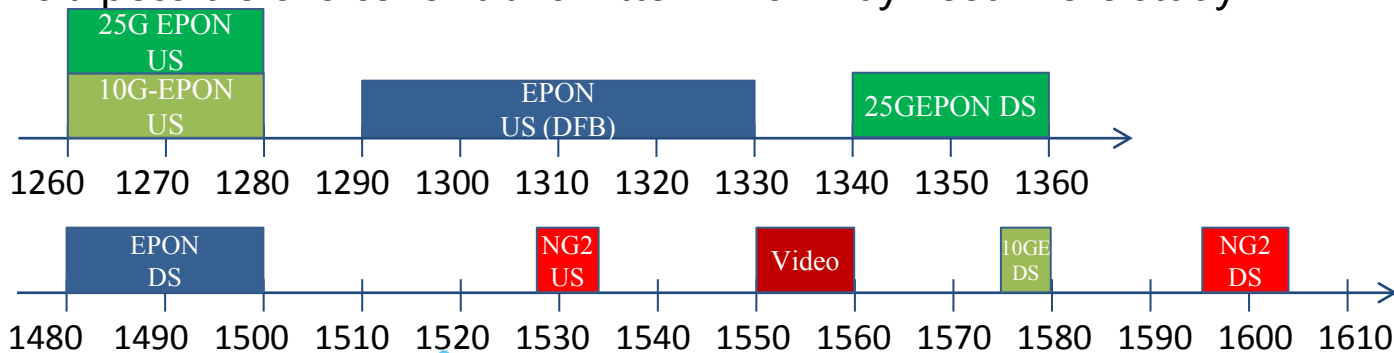
Low cost

No need TEC temperature control in optical modules

laser wavelength has big excursion range ($\sim \pm 3\text{nm}$)

Wide isolation band for upstream and downstream wavelength

DML is a possible choice for transmitter which may need more study



NG-EPON Wavelength Plan option 1 cont.

-50G/100G Wavelength Plan

Reuse CWDM 25G single channel as λ_0 of 100G-EPON

Redefine EPON upstream wavelength as λ_1 , λ_2 and λ_3 of 100G-EPON

DS at 1320~1330nm and US at 1290~1300nm with 400GHz channel spacing

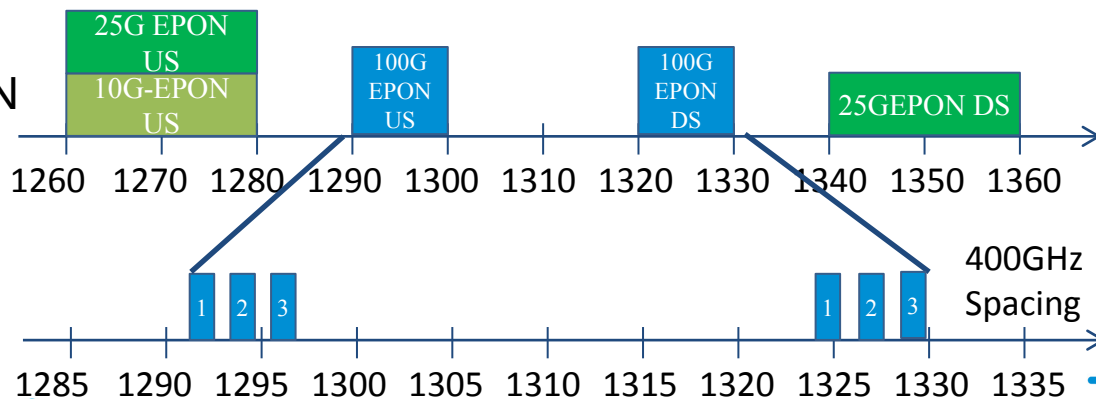
Need temperature control, but not as accuracy as DWDM laser

Relax laser wavelength excursion range ($\sim \pm 0.5\text{nm}$) than DWDM

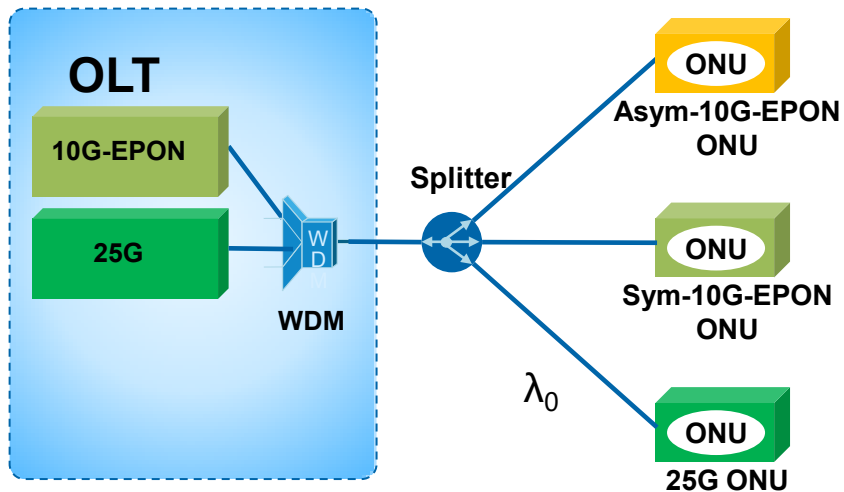
DML is a possible choice which need more study

Use λ_0 and λ_1 for 50G

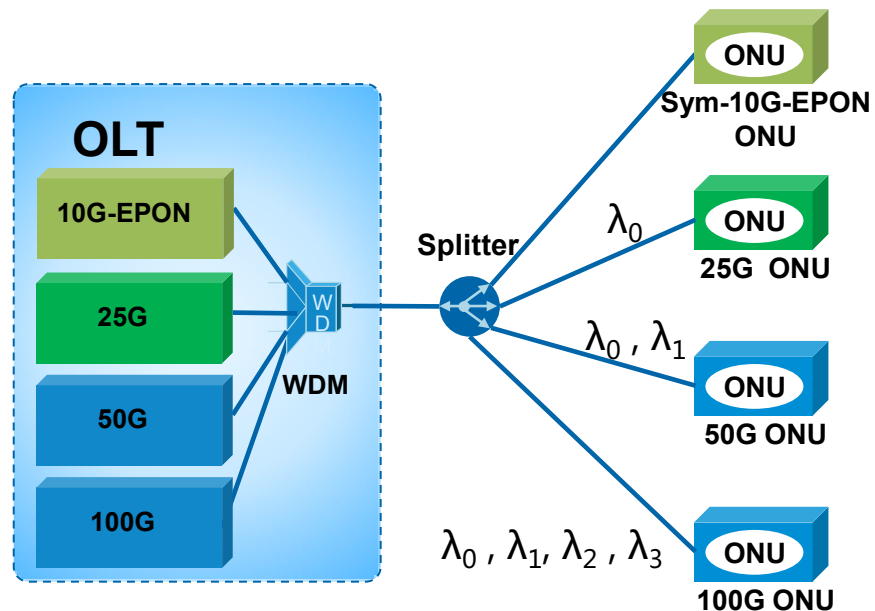
Coexists with Sym-10G-EPON



Migration of 10G-EPON to NG-EPON -with NG-EPON wavelength plan option1



10G, 25G Era



10G, 25G, 50G, 100G Era

NG-EPON Wavelength Plan option 2

-25G/50G/100G Wavelength Plan

λ_0 for 25G single channel

DS 1356.53nm with 800GHz spacing

US 1310nm CWDM wavelength

λ_1 :

Reuse 10G-EPON wavelength plan

λ_0 and λ_1 for 50G, λ_1 should be upgraded to 25G

λ_2 and λ_3 :

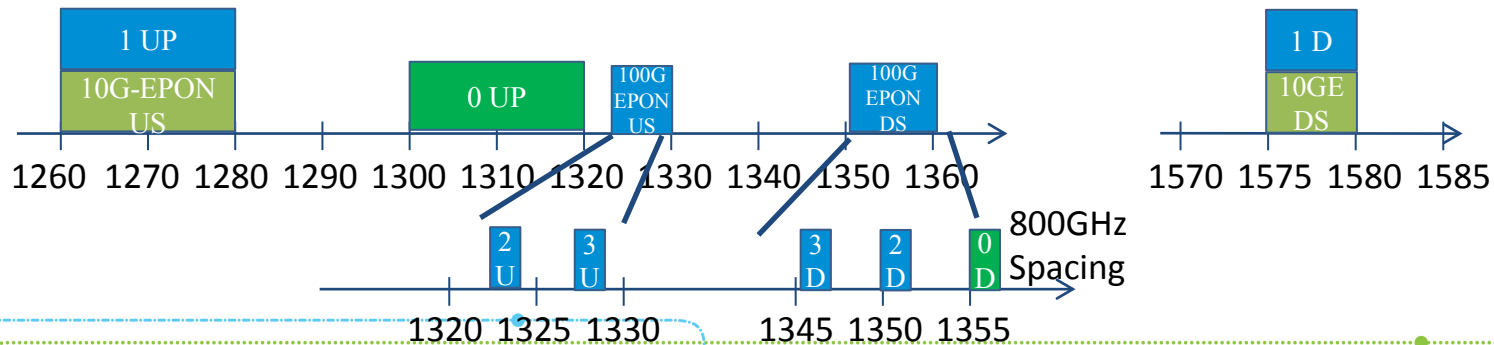
800G Spacing wavelength plan

DS 1346.78nm and 1351.64nm, US 1323.00nm and 1327.69nm

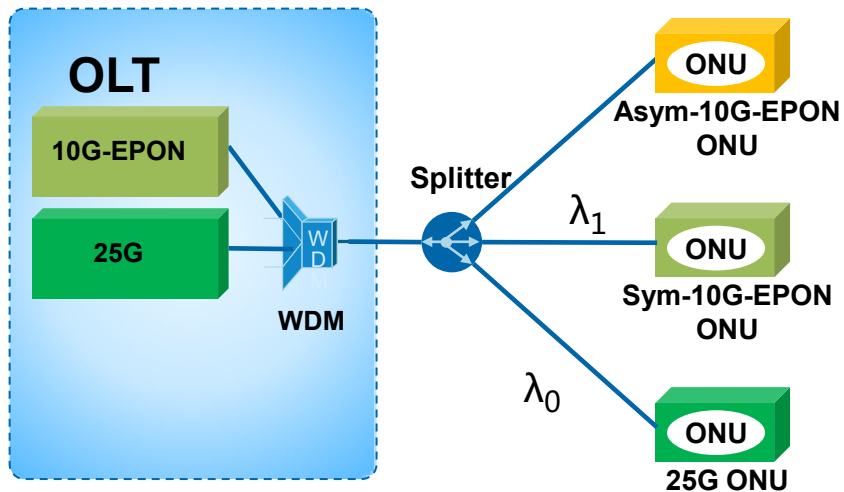
Low cost compared to DWDM

Need temperature control, but not as accuracy as DWDM laser

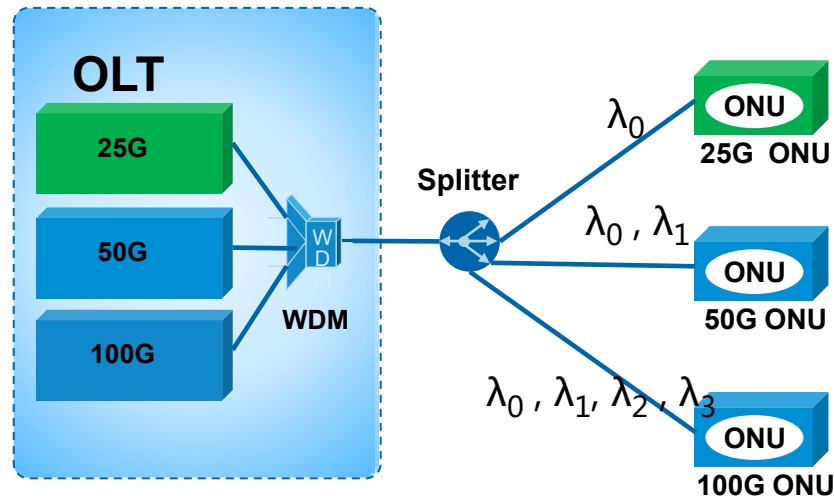
Relax laser wavelength excursion range ($\sim \pm 1$ nm) than DWDM



Migration of 10G-EPON to NG-EPON -with NG-EPON wavelength plan option2

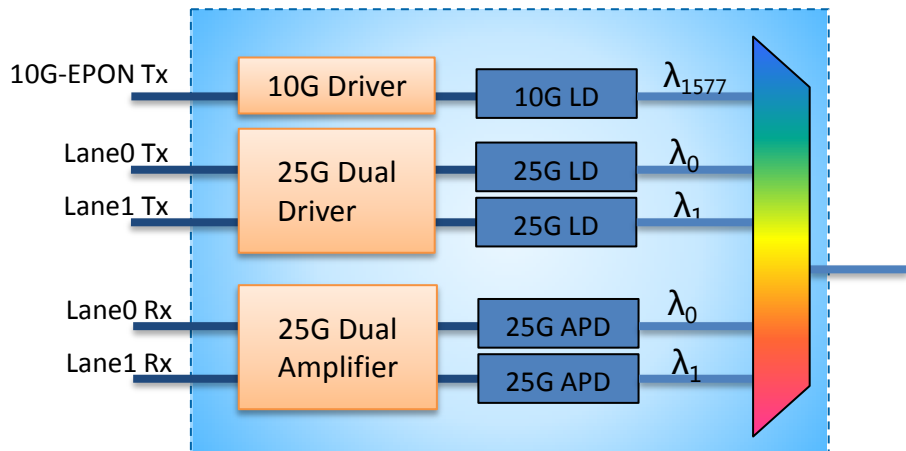


10G, 25G Era

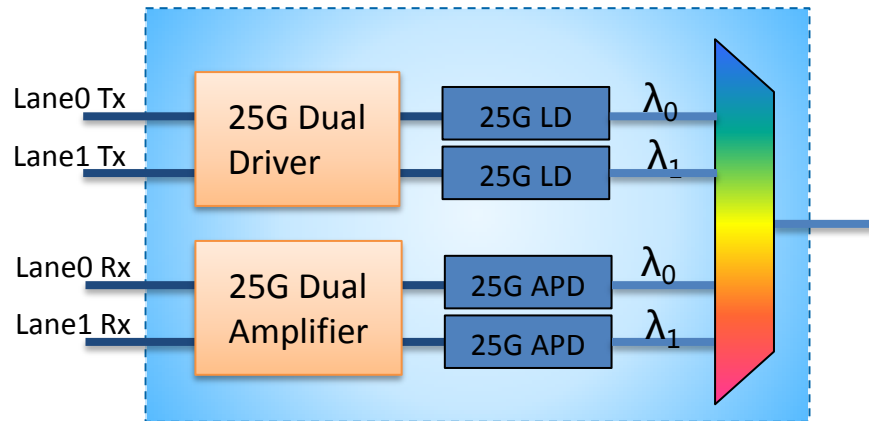


25G, 50G, 100 Era

50G NG-EPON OLT example



Wavelength plan option 1



Wavelength plan option 2 (note)

Note: λ_1 could work at 10G and 25G configured by software
When there are 10G-EPON ONU, λ_1 work at 10G rate
When there is no 10G-EPON ONU, λ_1 upgrade to 25G rate

Conclusion

Propose to adopt the wavelength plan as the contribution proposed for 802.3ca

Option 1:

- All NG-EPON channels in O band

- OLT module need an extra 1577 laser for 10G-EPON coexisting with NG-EPON

Option 2:

- Because of the reuse of 1577nm wavelength,

- Only 2 downstream wavelength other than 3 for 10G-EPON upgrade to 50G NG-EPON

- 1577 wavelength may need dispersion compensation for 25G transmission

Thank you



Tomorrow never waits

