

# Optical: Passive Multiplexers (Mux, Muxes, Filters)

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## Overview

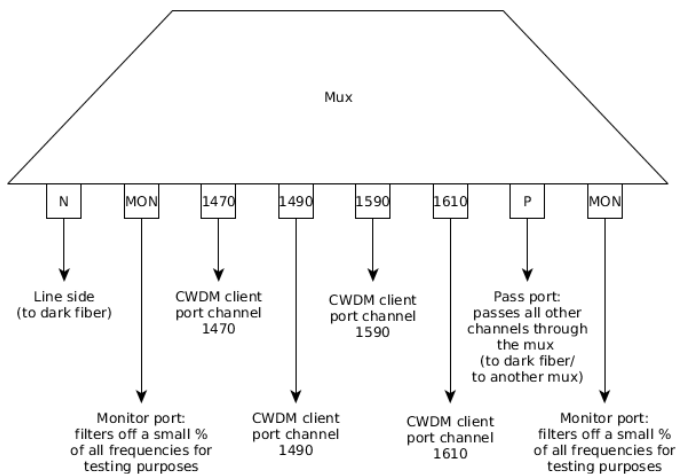
- Passive muxes, as the name implies, are unpowered, unmonitored devices
- Sometimes called filters
- Passive muxes allow you to combine and split apart many frequencies of light on one fiber pair

## Details

- Filtering technology
  - Inside of a mux one of these three technologies is used to filter frequencies of light
    - Fiber Bragg Grating
    - Thin Film Filter
    - Arrayed Waveguide Grating
- Channels - CWDM vs DWDM
  - ITU
    - Standards for channel width and numbering for each frequency
    - In the c-band (DWDM, diagram here [Optical: Dense Wavelength-Division Multiplexing \(DWDM\) Channels](#)) this is typically 100GHz spacing for passive filters
  - See [Optical: Coarse Wavelength-Division Multiplexing \(CWDM\) Channels](#)
  - See [Optical: Dense Wavelength-Division Multiplexing \(DWDM\) Channels](#)

## CWDM Example

- Example diagram:



## Add/Drop Design Example

- Example diagram
- In this example each location on the add/drop path has two circuits - one east and one west (color coded)
- Each lateral is folded, so keep in mind that
  - A fiber cut on a lateral would take down the location served by the lateral AND all other locations served on the add/drop path would see one of their two paths go down

