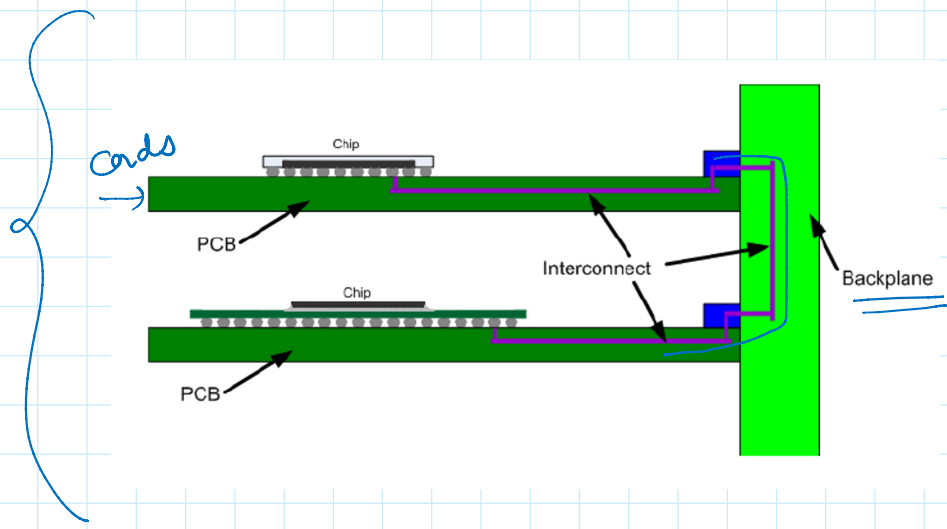
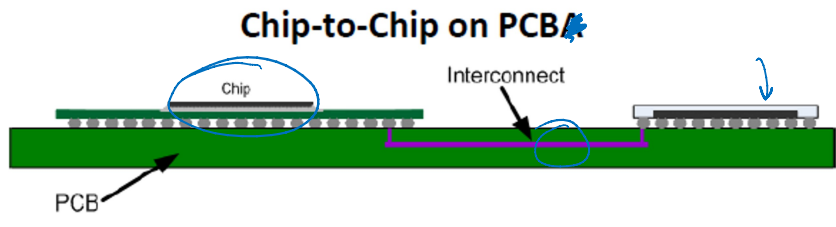
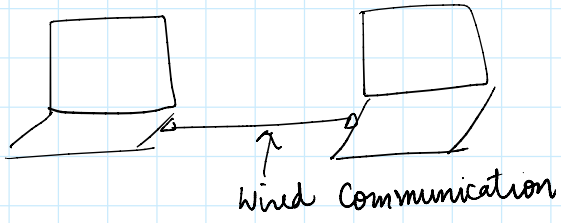
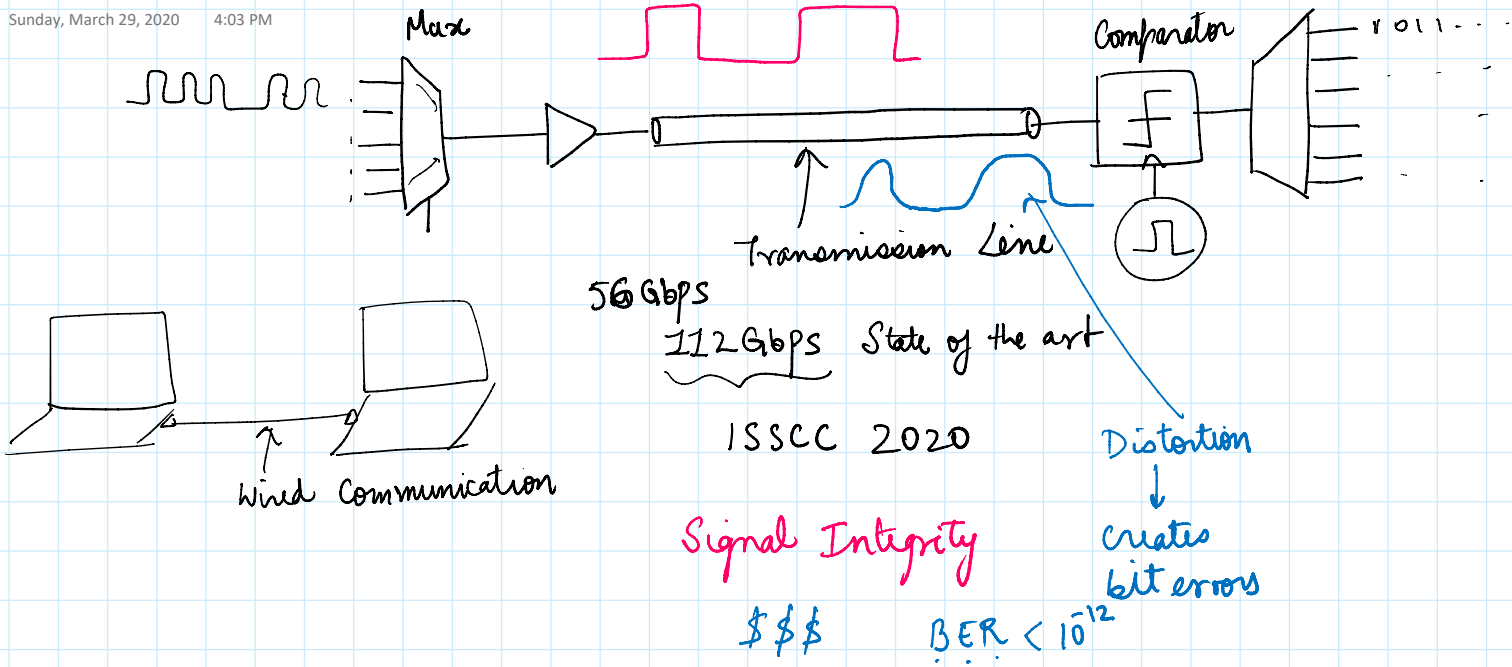


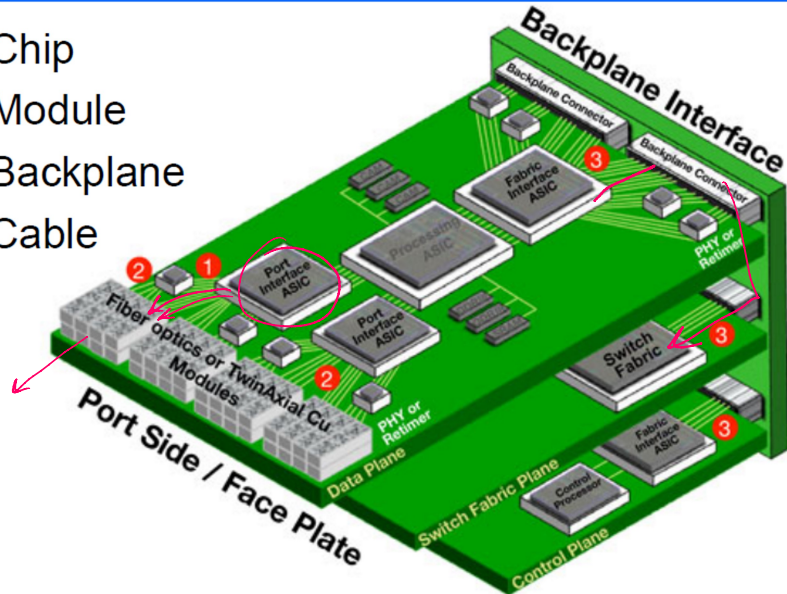
Lec-1

Sunday, March 29, 2020 4:03 PM



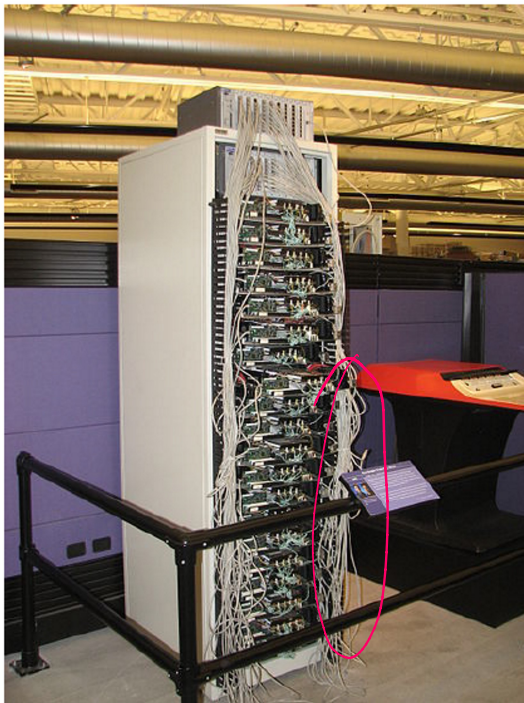
Standards categorize types of channels

1. Chip-to-Chip
2. Chip-to-Module
3. Chip-to-Backplane
4. Chip-to-Cable



Src: <https://www.synopsys.com/Company/Publications/DWTB/Pages/dwtb-data-centers-2014Q1.aspx>

Google's first production server (1998)



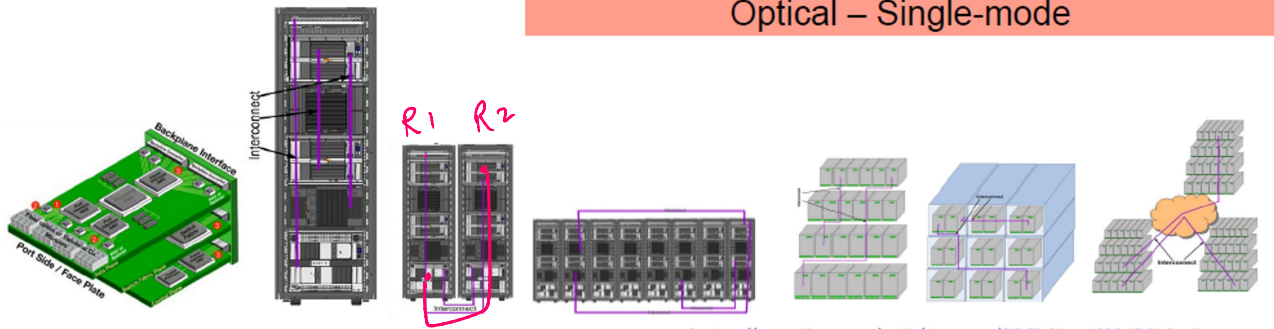
Google's Council Bluffs datacenter (2012)



Electrical Link Distance

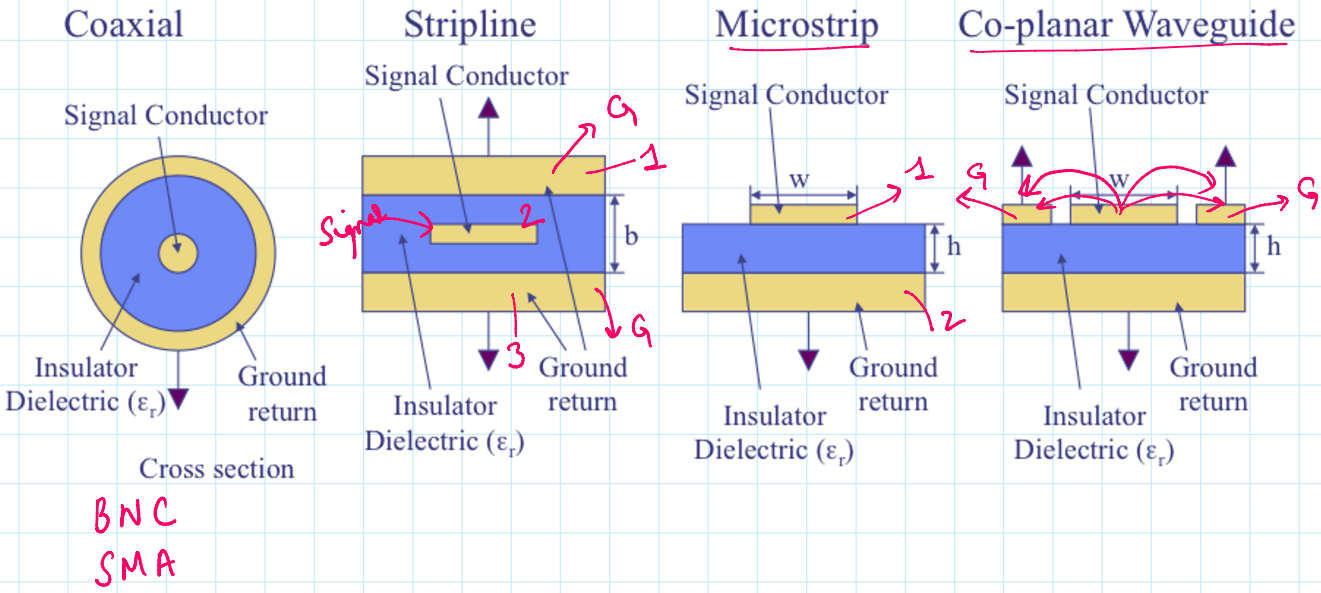
Optical – Multi-mode

Optical – Single-mode

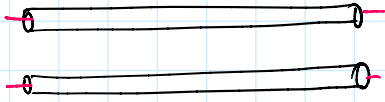


Src: <http://www.oiforum.com/public/documents/OIF-FD-Client-400G-1T-01.0.pdf>

Inter Interconnect Application	Distance Up To	Types of interfaces
Chassis to Chassis within a rack	~ 3m	Electrical or Optical
Rack to Rack side-by-side	~ 10m	Electrical or Optical
Rack to Rack within a row	~ 50m	Optical (MMF/SMF)
Rack to Rack within a building	~ 100-300m	Optical (MMF/SMF)
Rack to Rack within a data warehouse	~ 1,000m	Optical (SMF)
Rack to Rack within a campus	~ 2km	Optical (SMF)



Transient Time Effect



When to consider a pair of
wire as a transmission line? ..