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Optical Solutions supporting 5G and Beyond

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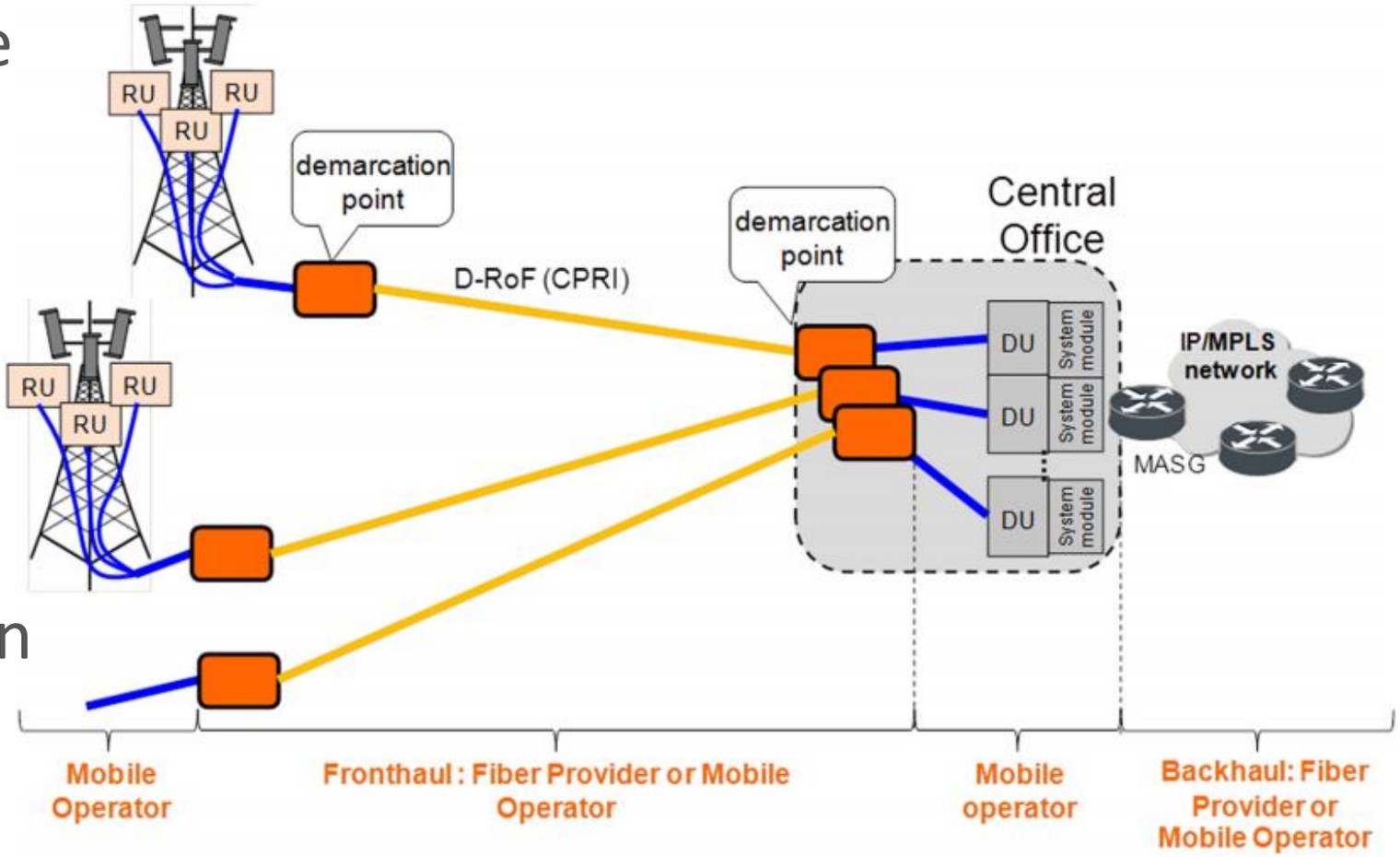
Data Transport in 5G Networks: The Problems

- 1000x Capacity Increase
  - 10X bandwidth
  - 10X cell densifications
  - 10X massive MIMO
- Low latency
- Low power consumption
- Low cost/footprint



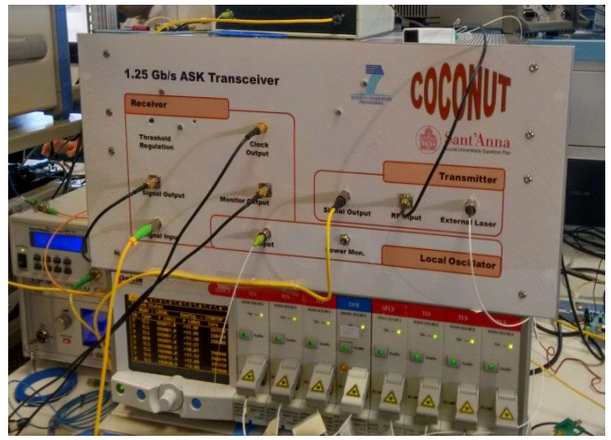
- **Do we simply need to scale actual optical standards to fullfill 5G requirements? NO**

Data Transport in 5G Networks: Role of Optical Technologies

- Fronthaul opportunities are still to be fully caught
  - Need to develop ad-hoc optical solutions
  - Need of joint optical-radio research communities on optimal architectures
- Femtocell optical technologies
  - Visible Light Communications

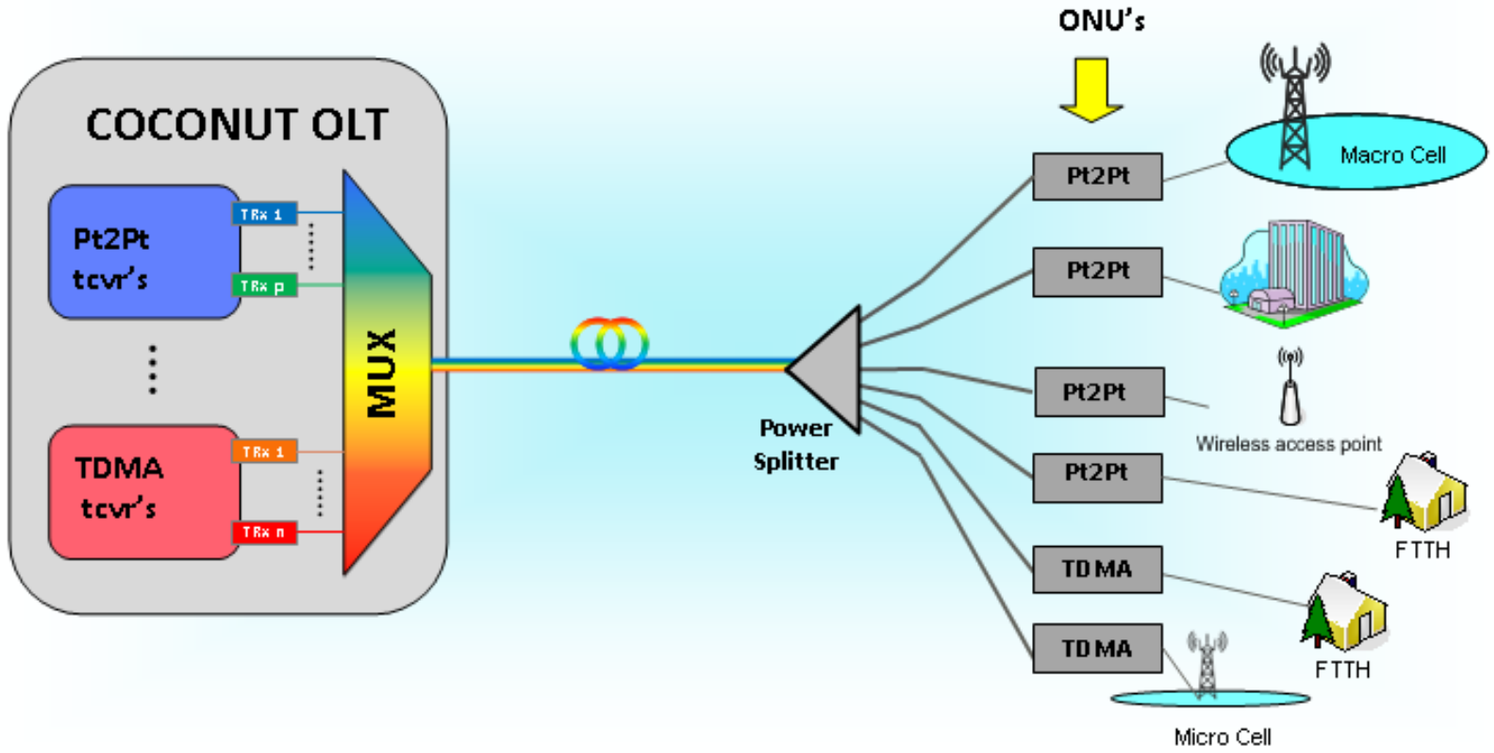
λ to the Antenna: a solution for 5G FrontHaul

- Ultra Dense WDM (UD-WDM), with no/limited filters
- Reuse existing infrastructures
- Gridless Operations
- High power budget (> 45 dB)
- High Scalability (nodes and capacity)
- High Power Efficiency
- Low Latency
- Low-cost levels



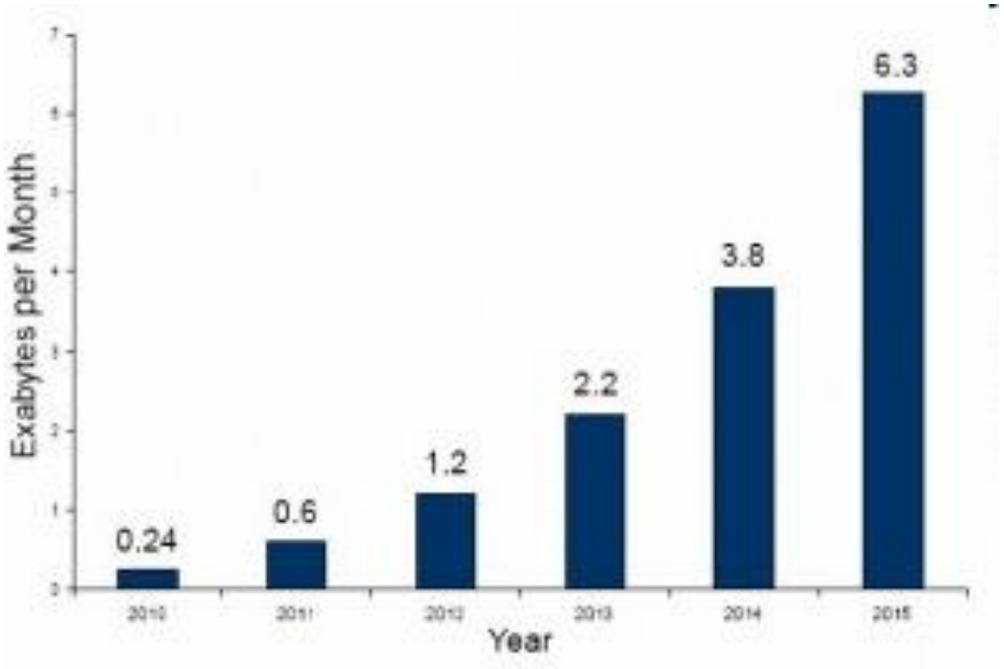
COCONUT

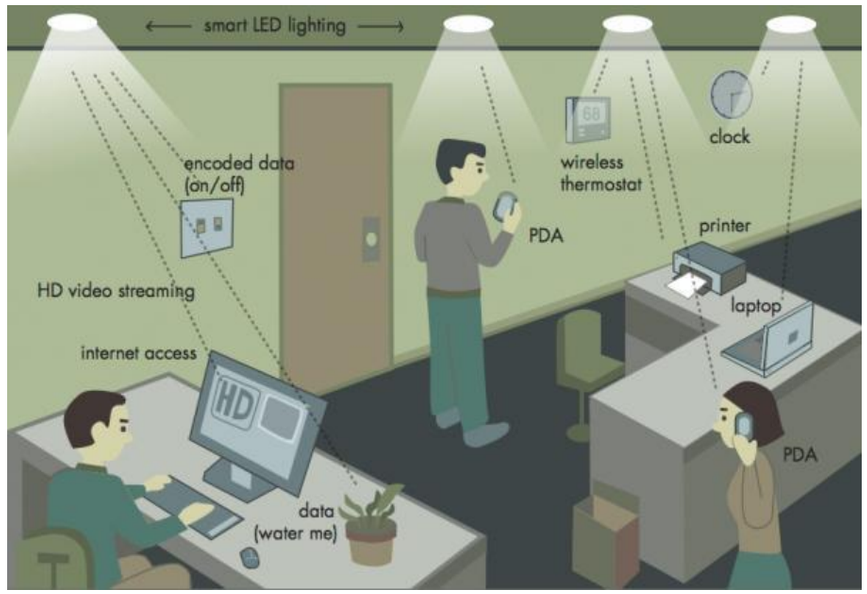
SEVENTH FRAMEWORK PROGRAMME



VLC: a solution for indoor traffic growth

Most of mobile traffic is generated indoor (source: Ericsson)





- Optical Wireless can become a powerful partner to RF-wireless especially in high-density conditions (cheap devices)

- Various potential areas in various environments:
  - high speed (up to **5Gb/s/led**), secure communications
  - ultra-high user density
  - niche markets