

09 June 2013


ICC2013 Workshop RoF
2013-06-09

RoF Transport Over Nets: backbone, metro and access Challenges

Le Binh
European Research Centre

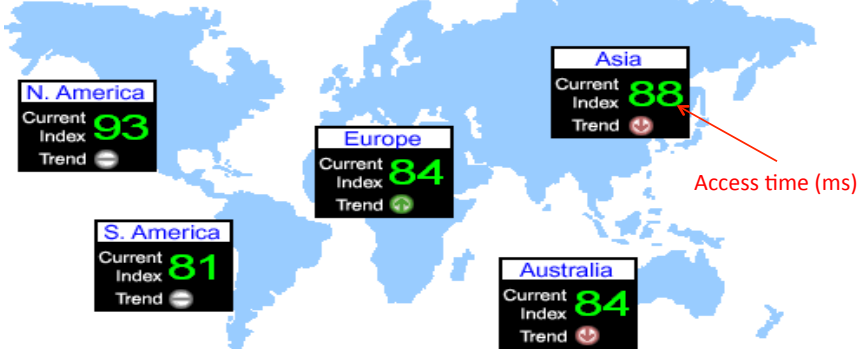
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DEMANDS: Internet traffic → 50,000 Exa-bytes/month (2013) → Yotta-Bytes

- Global Internet
- Backbone, metro, Access Networks
- Optical – Wireless Access Networks –C-RAN



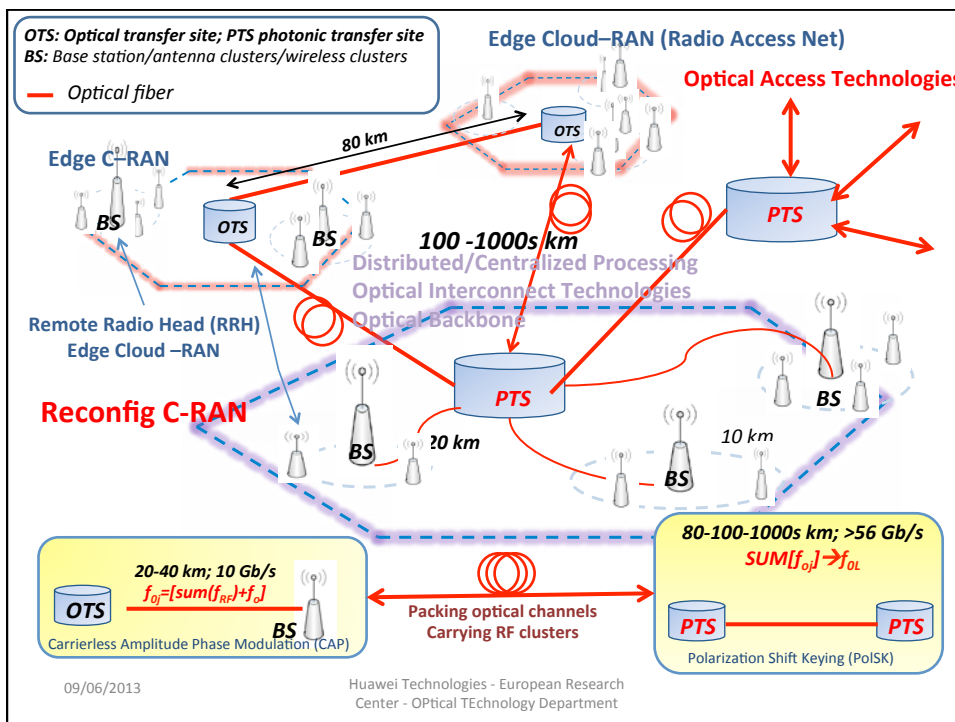
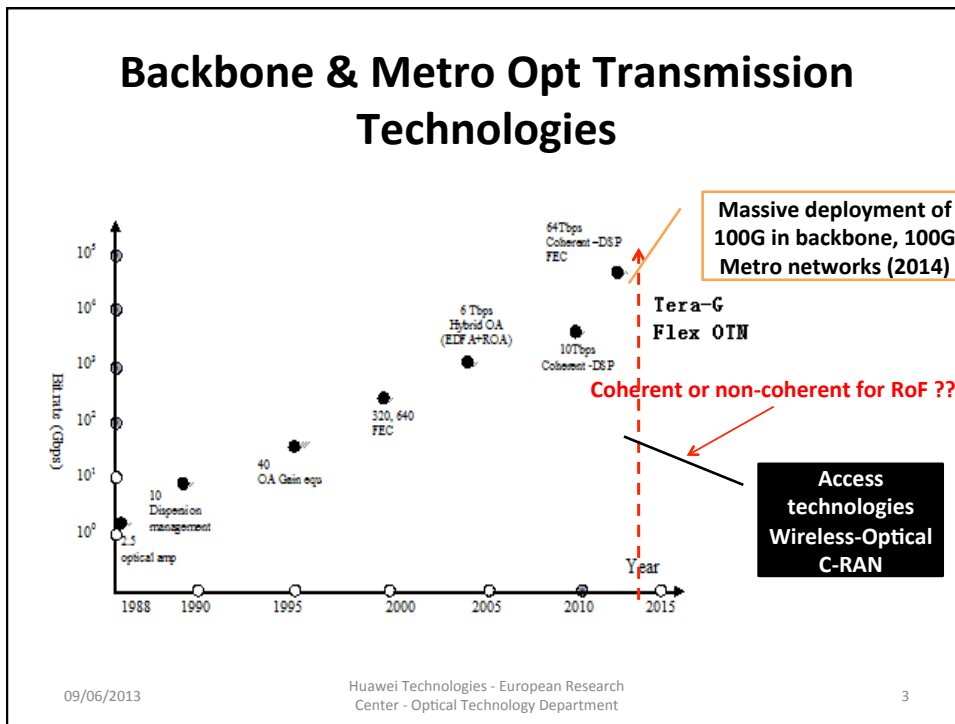
Region	Current Index	Trend
N. America	93	↔
S. America	81	↔
Europe	84	↕
Asia	88	↘
Australia	84	↘

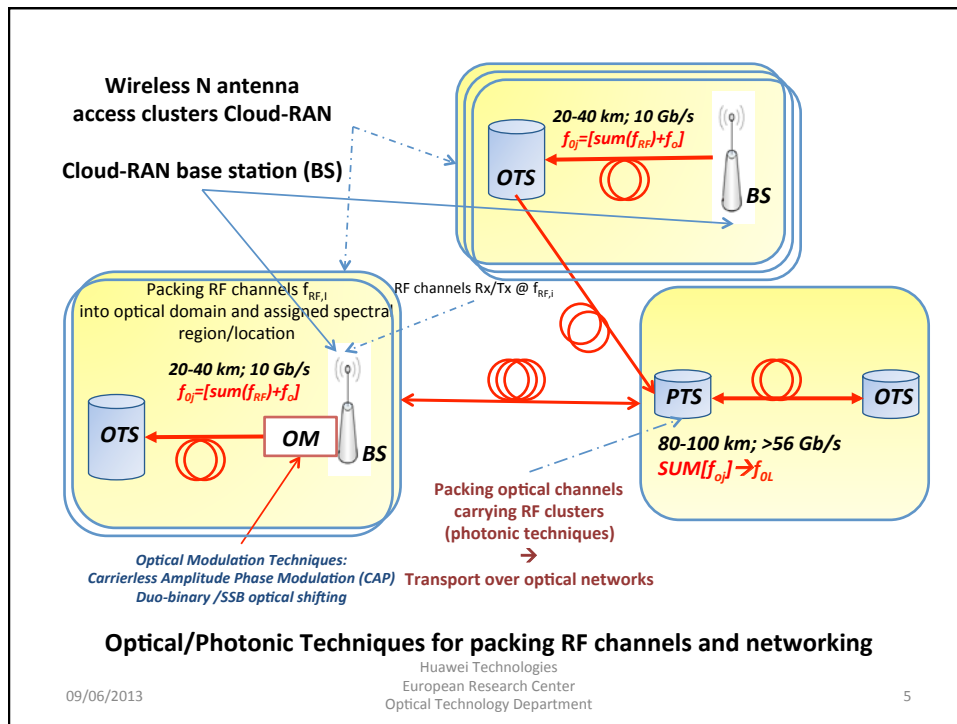
- Explosion of Smart phones (millions to billion users)
- Personal multi-access home gadgets
- Public services etc..., Data centers
- Cloud-RAN → intelligence edge access and centralized DSP

09/06/2013

Huawei Technologies - European Research
Center - Optical Technology Department

2





Challenges

- **Ultra-wideband RF and Optical Transport**
- **RF to Optical**
 - RF channels **received** in electrical domain with RF carriers \rightarrow **optical modulation** to shift to optical domain.
 - RF carriers **remained** unchanged and **embedded** in optical region as allocated by ITU-grid or OTN flex grid networks
 - **Packing** RF embedded optical in wider optical channels in the photonic domain.
- **Robust** handling for linear and nonlinear impairments
- **Receiver structures:** coherent and direct detection.
- **Photonic transfer sites**
 - structured in such a way that all the optical channels from the OTS remain unchanged and packed in photonic domain.
 - Routing of optical RF channels: optical routers??
- **Wireless and optical Access technologies**
- **Data plane and routing plane** – control algorithms.
- ?????????
- **C-RAN and reconfig. C-RAN processing**
- **Distributed or highly centralized processing/networking**
- **RF and optical signaling**

Research

Modulation & reception

- **Modulation Techniques in the optical domain** → transferring of RF channels into optical domain leading to embedded RF optical channels.
- **Coherent and non-coherent reception techniques for multi-RF carrier channels**

Pre-processing

- **Packing of RF-embedded optical sub-channels into optical channels** so as no alteration of RF channels is imposed.
- **Wireless and Optical Ultra-Broadband Access and Transfer, Handover etc...**

Transport & Cloud Networking

- **Photonic techniques for packaging several RF-embedded optical channels in the photonic optical domain.**
- **Photonic transfer techniques for transport over Cloud environments**
- **Flex Grid Optical Transport Networks (OTN)**
- **Signaling for C-RAN and reconfig. C-RAN**