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# Optical Networks Enabled C-RAN Fronthaul

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## C-RAN

### Revolutionary evolution of network architecture – C-RAN

**Traditional BTS**

- Traditional BTS system
  - (Huge) integrated system
  - BTS & supporting facility require indoor protection
  - Long RF cable to antenna

**Distributed BTS**

- Distributed BTS
  - Outdoor RU, Indoor BBU
  - DU to multi-RU
  - DU-RU connected via point-to-point dark fiber

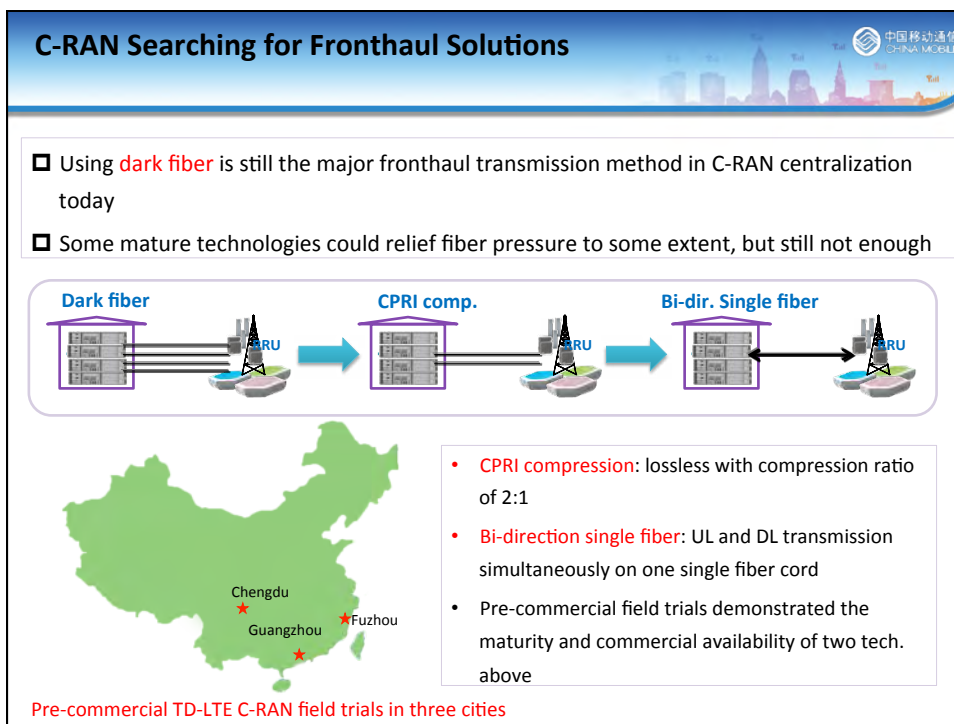
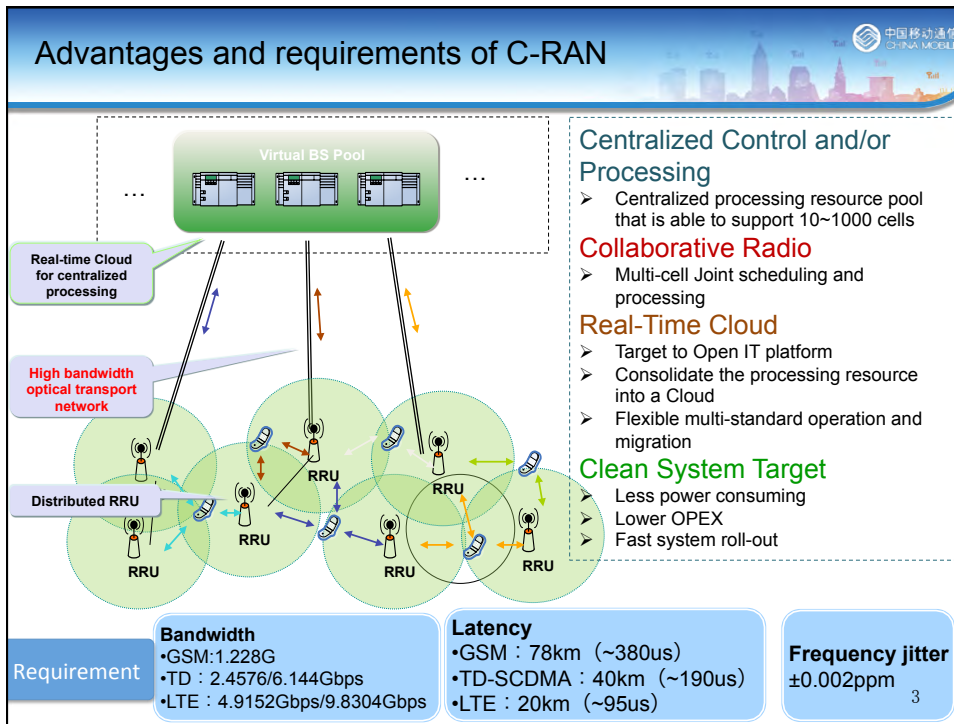
**C-RAN**

- C-RAN
  - Centralized processing
  - Collaborative Radio
  - Open platform towards Cloud computing

**C-RAN Field Trials in**

- First stage trials finished
- Second stage trials sync up with TD-LTE roll out (200K BS within 2013)

2013/4/8



## Other Candidates?

Efficient Fronthaul solutions and mature ecosystem needed

- ❑ Colored OTU:
  - Save fiber resource, e.g. one 6G fiber module could support 3 TD-L cells with 8 antennas (without compression)
  - Products far from mature (e.g. maximum supported distance)
- ❑ Microwave:
  - Suitable for scenarios where it is not easy to deploy fiber
  - Low capacity (~1Gbps), high latency (~400us), relatively high cost, not so mature ecosystem, subject to rainy/foggy weather
- ❑ Ethernet:
  - Extensively available, mature ecosystem with low cost; packetized CPRI
  - synchronization issue
- ❑ Too expensive for WDM/OTN

## Summary

- **C-RAN:** essential in modern wireless infrastructure
- **Wireless needs Optical to be “Complete”:** Met requirements for bandwidth, networking, synchronization and others in the **backhaul**; not yet in the **fronthaul**
- **RoF, WDM** for the rescue?