NG-EPON for Mobile Access Network

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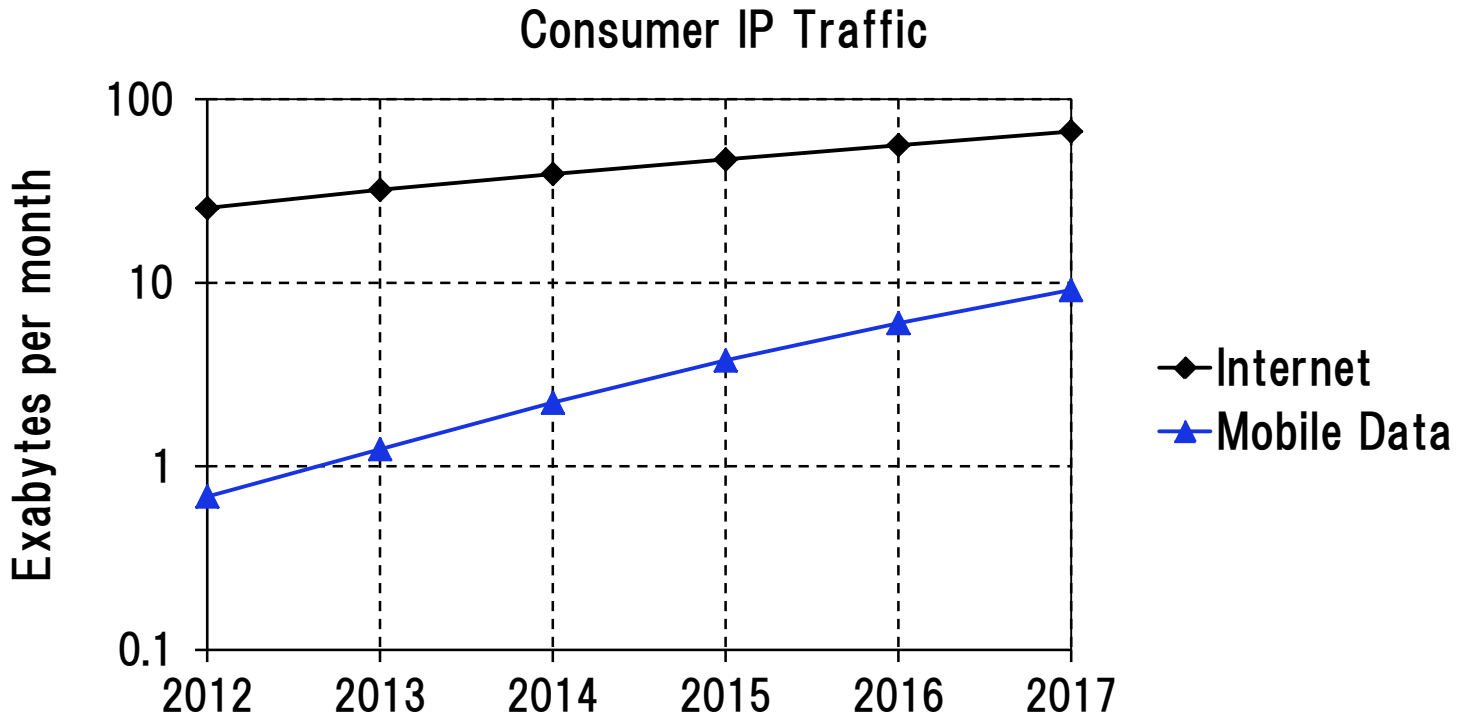
Outline

- ✓ Upcoming mobile network
- ✓ Thoughts on coexistence of NGEPON

Upcoming mobile network

Background: Growing Mobile Traffic

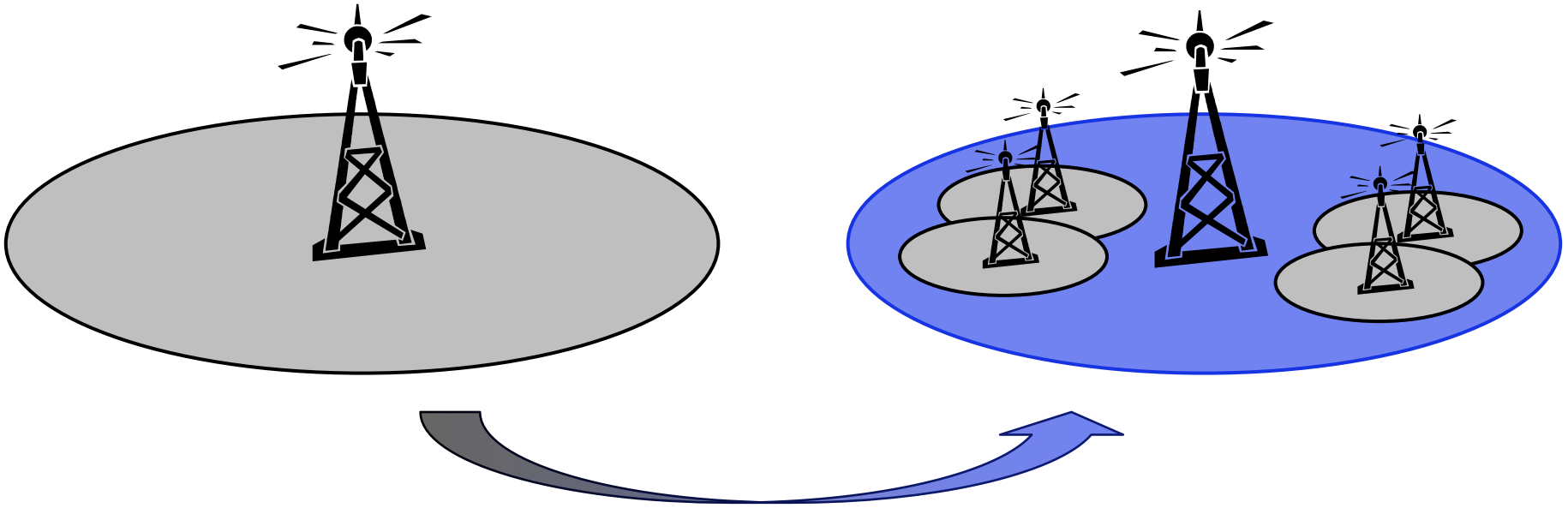


- ✓ Mobile data traffic is increasing more rapidly than fixed access traffic.
- ✓ Most of mobile operators are concerned with the way to cope with this traffic expansion.

Ref. “Cisco Visual Networking Index: Forecast and Methodology, 2012-2017”

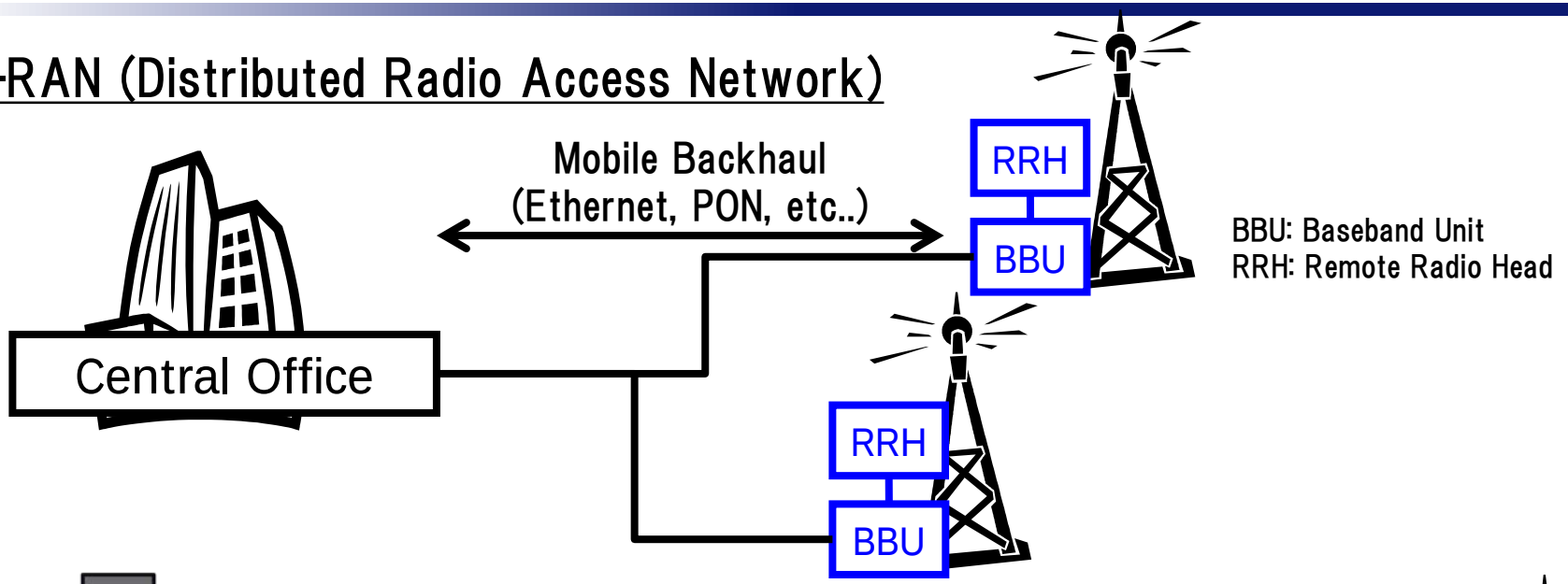
Cell Architecture

- ✓ In order to enhance the total capacity of cellular network, new cell architecture might be introduced.
- ✓ In general, pico cells are being overlaid on macro cell coverage.
  - Increasing pico cells requires more efficient access lines, such as PONs.

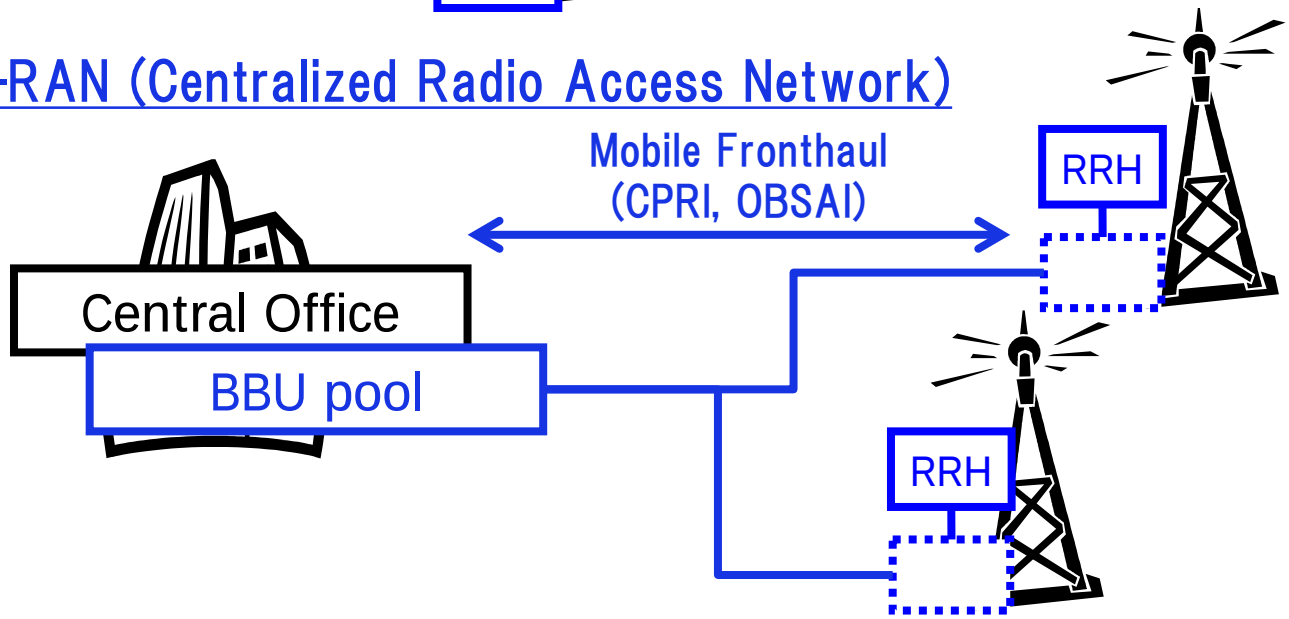


RAN Architecture Evolution

D-RAN (Distributed Radio Access Network)



C-RAN (Centralized Radio Access Network)



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D-RAN vs. C-RAN

	Pros.	Cons.
D-RAN	✓ Efficient use of backhaul bandwidth	✓ Interference between cell sites in small cell architectures
C-RAN	✓ Improvement of mobile user experience ✓ Smaller footprint and lower power consumption in cell sites	✓ Requirements for high capacity and low latency to access lines

Thoughts on coexistence of NG-EPON

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Coexistence with EPON

- ✓ Most of residential broadband services are served through FTTH (EPON).
- ✓ 10G-EPON is commercially available.
- ✓ Replacement of deployed ONUs requires a large CAPEX. It would be practically impossible to replace all 1G-ONUs.

  ⇒ Coexistence with 1G-EPON is necessary for the use of currently deployed ODN and ONUs.

Summary

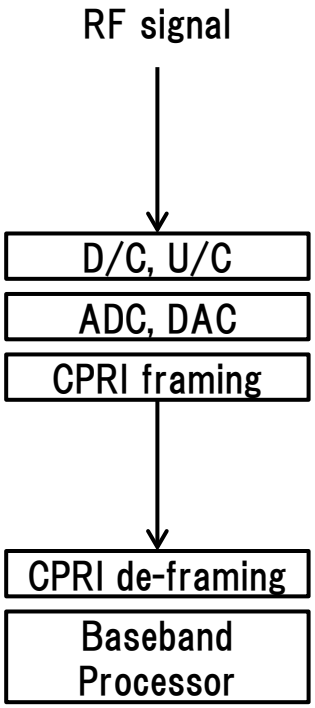
- ✓ NG-EPON should be applicable to mobile backhaul/fronthaul.
- ✓ NG-EPON should be able to coexist with currently deployed ODN and 1G-ONUs.

Appendix: CPRI Line Rate

user

cell

CO



option #	line rate (Mbit/s)
1	614
2	1229
3	2458
4	3686
5	4915
6	6144
7	7372
⋮	⋮

- ✓ CPRI transmits digitized baseband IQ signals.
- ✓ Line rate depends on granularity of sampling and quantization.
- ✓ Typically, bandwidth of ≥ 2.5 Gbps will be required for each cell site.