

IEEE802.1CM Terminology Considerations

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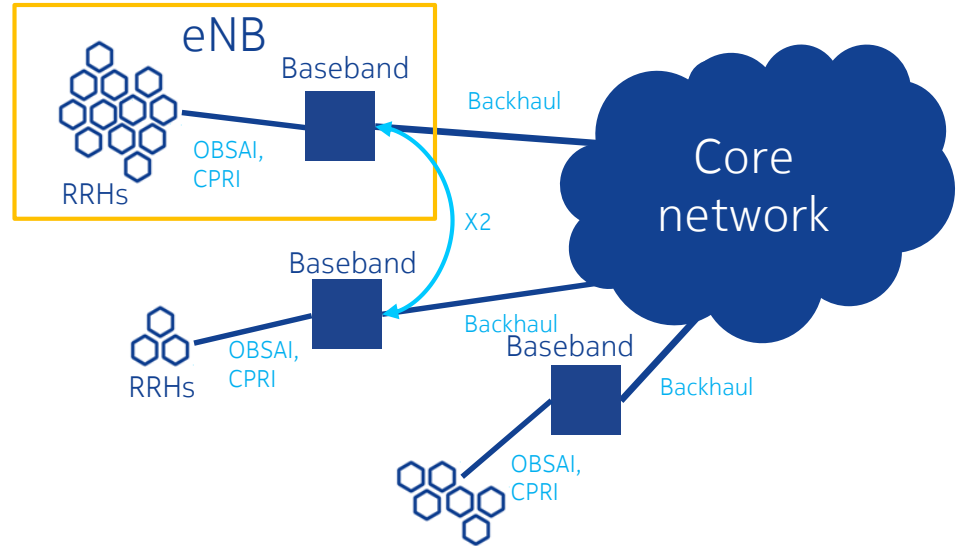
Motivation for presentation

- Current IEEE802.1CM PAR terminology:
 - Radio Equipment (RE) and the Radio Equipment Controller (REC).
 - RE is also referred to as Radio Unit (RU) and Remote Radio Head (RRH).
 - The REC is also referred to as Digital Unit (DU) and Base-Band Unit (BBU).
 - Fronthaul defined to be connection between RE and REC
 - Inherited CPRI terminology
- Ethernet fronthaul would require more generic terminology
 - Ethernet allows more options for network topology, nodes and functional splits
 - CPRI is focused on point-to-point connectivity
 - Should start with nomenclature which is not limiting evolution

RAN architecture

Basics

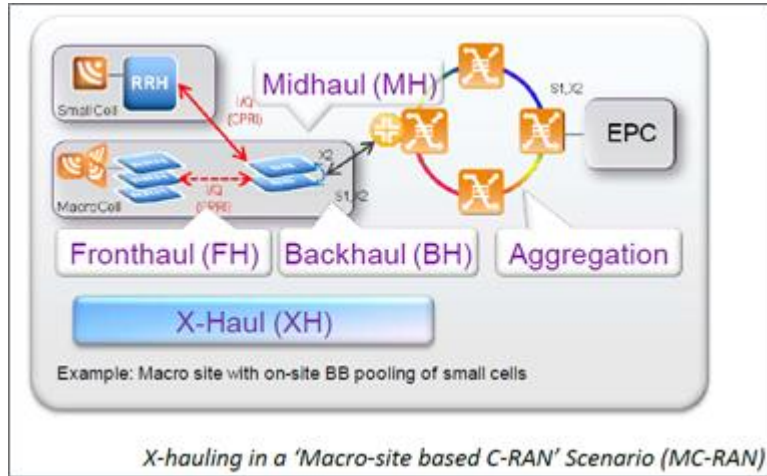
- BTS is eNB in 3GPP definitions
 - RRH+Baseband
- Main interfaces are
 - Uu – air interface towards mobiles
 - S1 – backhaul interface towards core network
 - X2 interface to peer BTS
- CPRI/OBSAI based fronthaul is internal interface i.e. not defined by 3GPP



Fronthaul definition

Some definitions for hauls

X-Hauling in Open RAN Environments



In a hierarchical telecommunications network the backhaul portion of the network comprises the intermediate links between the core network, or backbone network and the small subnetworks at the "edge" of the entire hierarchical network. (Wikipedia)

MEF 22.1.1

Backhaul is the Carrier/Metro Ethernet Network between the RAN base station and the RAN network controller.

Midhaul is the Carrier/Metro Ethernet Network between RAN base station sites.

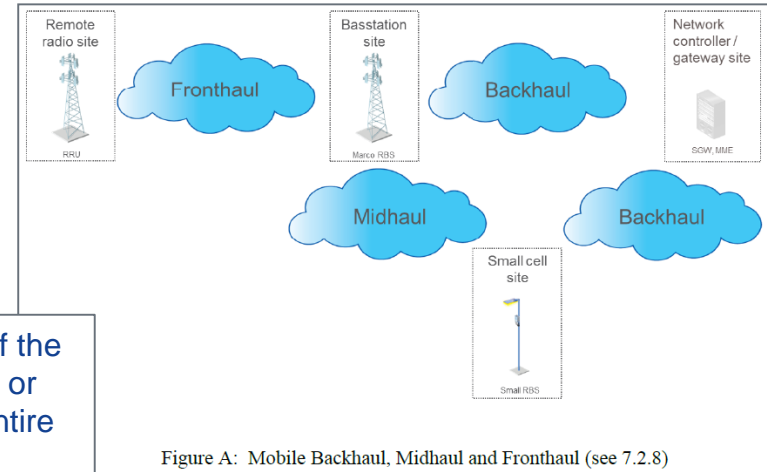
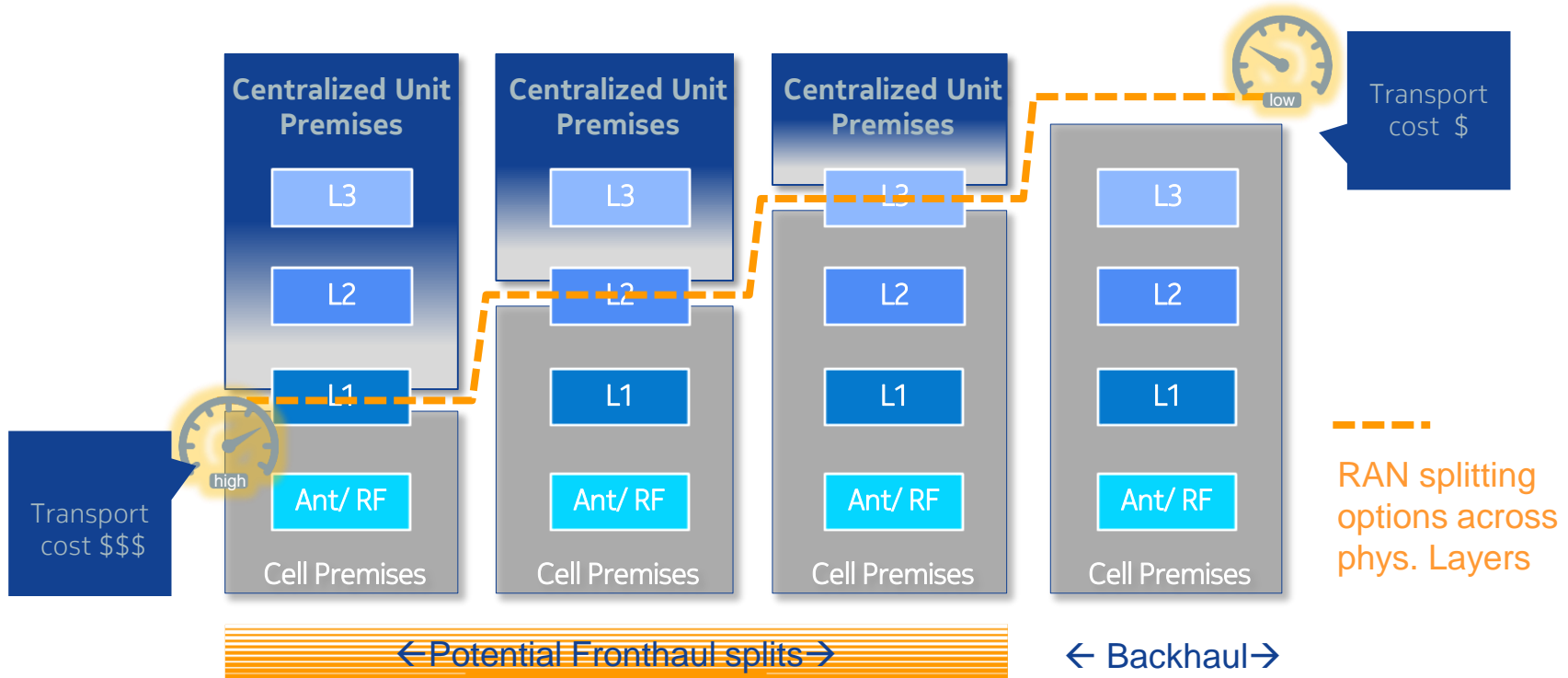


Figure A: Mobile Backhaul, Midhaul and Fronthaul (see 7.2.8)

Optimal Functional Split is a Multi-dimensional Tradeoff

There is no one-size-fits-all solution as split may depend on deployment scenario



Future Fronthaul network landscape

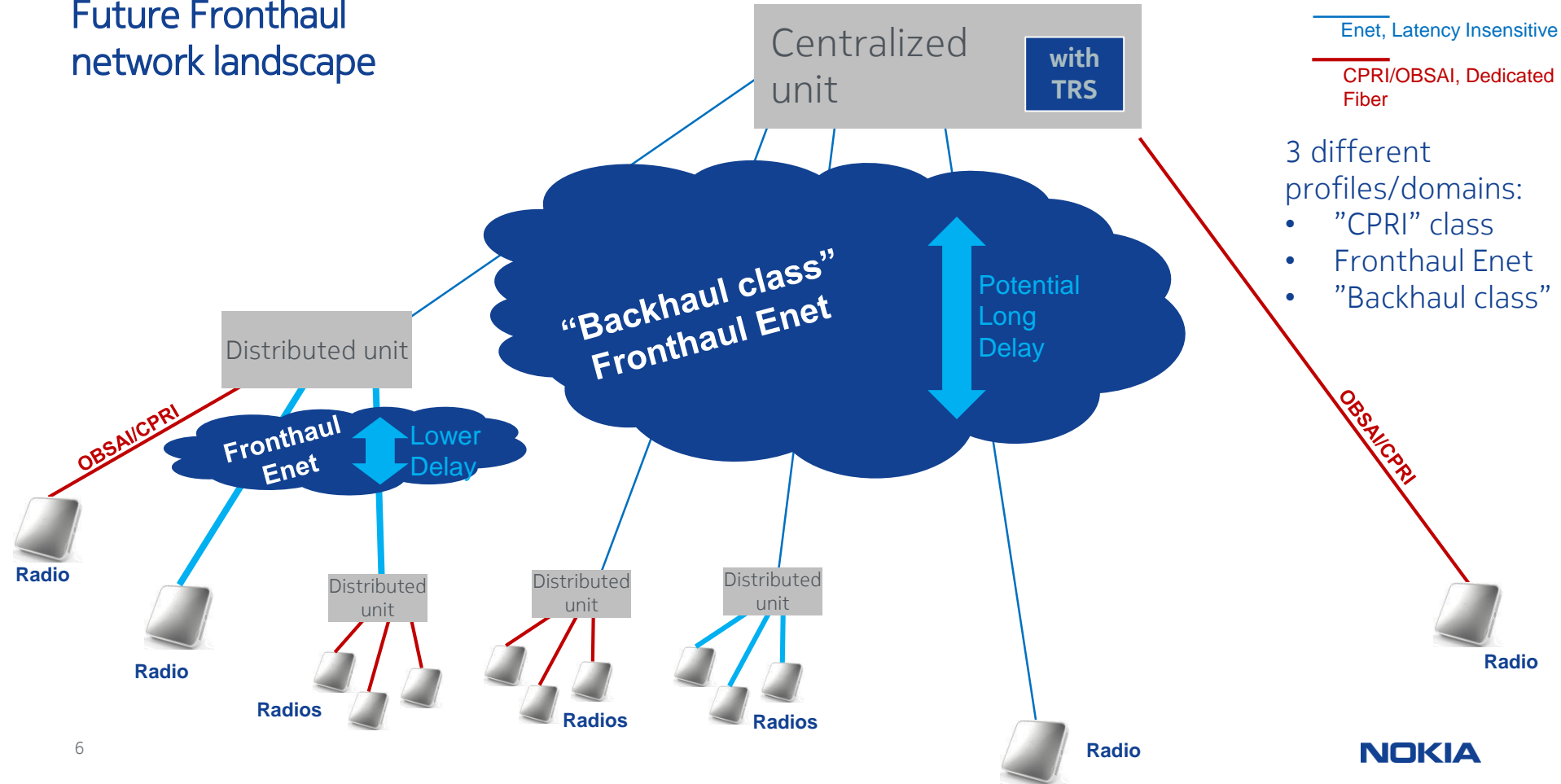
Enet, Latency Sensitive

Enet, Latency Insensitive

CPRI/OBSAI, Dedicated Fiber

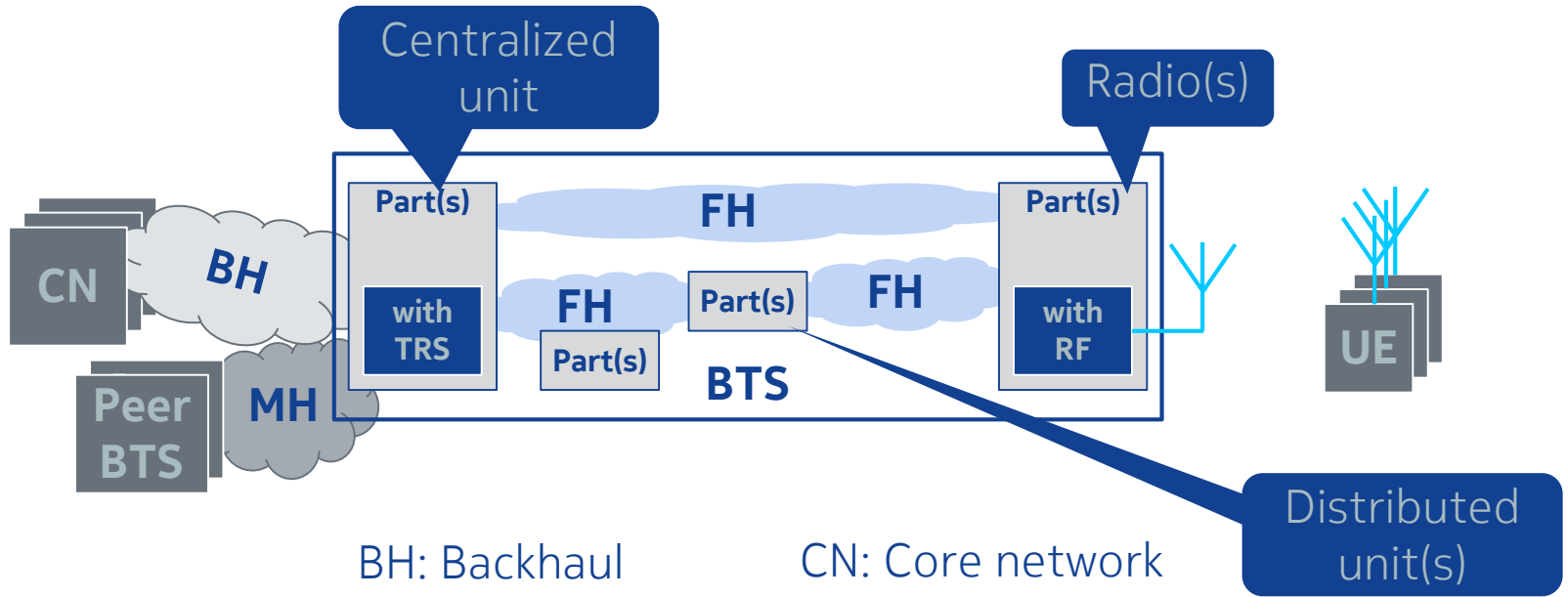
3 different profiles/domains:

- "CPRI" class
- Fronthaul Enet
- "Backhaul class"



Fronthaul definition that could be used here

From the perspective of a single base station...

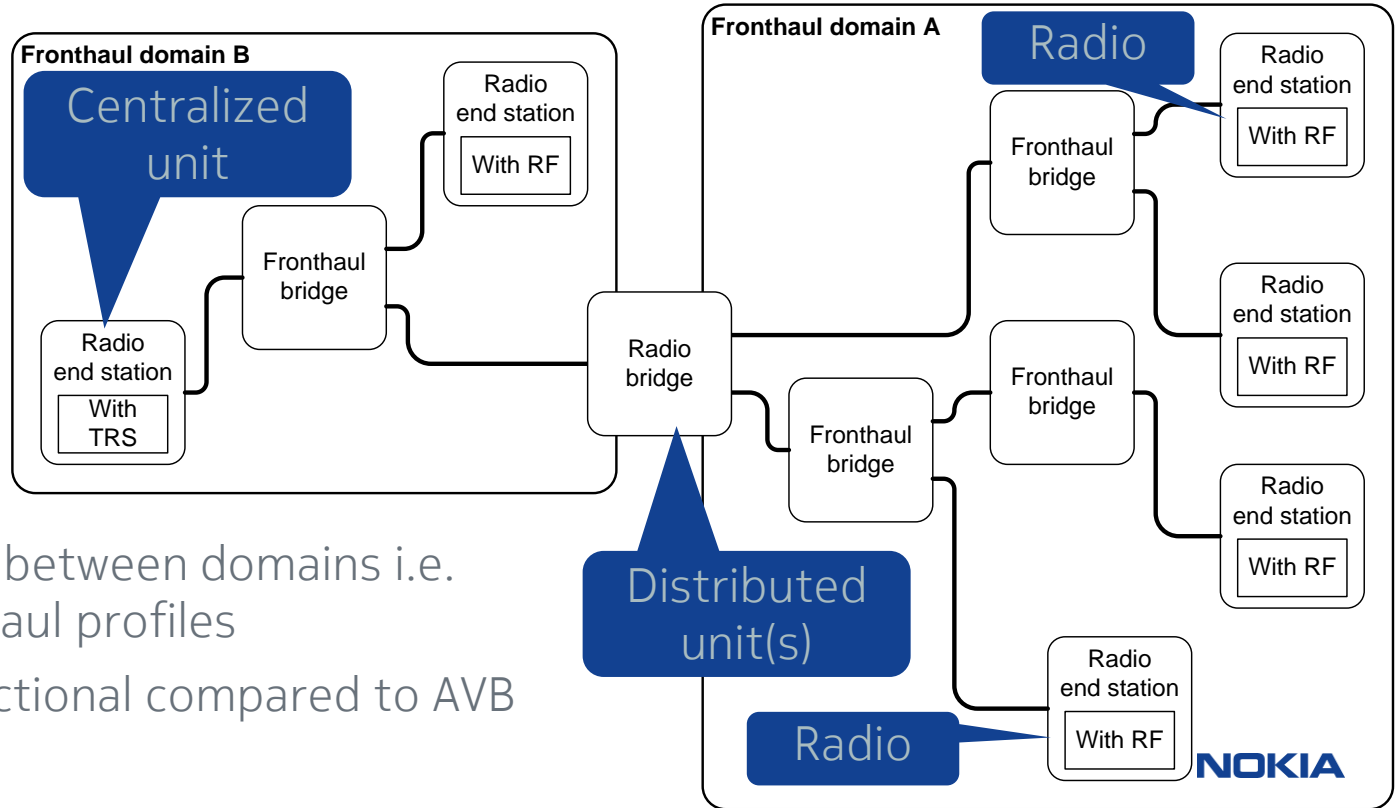


BH: Backhaul
FH: Fronthaul
MH: Midhaul

CN: Core network
BTS: Basestation
UE: User Equipment
TRS: Transport

Comparison against 802.1BA

- Compared to AVB standard landscape looks a bit different
- Additional to end stations there is need to have "radio bridges" to interoperate between domains i.e. different fronthaul profiles
- Traffic is 2-directional compared to AVB



Nomenclature summary

- RE (Radio Equipment) and REC (Radio Equipment Controller) may not be generic enough terms in Ethernet concept
 - As shown there might be need to have equipment (“radio bridges”) that are not RE nor REC
- In each domain there are only 2 end-points:
 - Other may be either radio i.e. RE or BBU i.e. REC, but other may not be.
 - Radio end-stations?