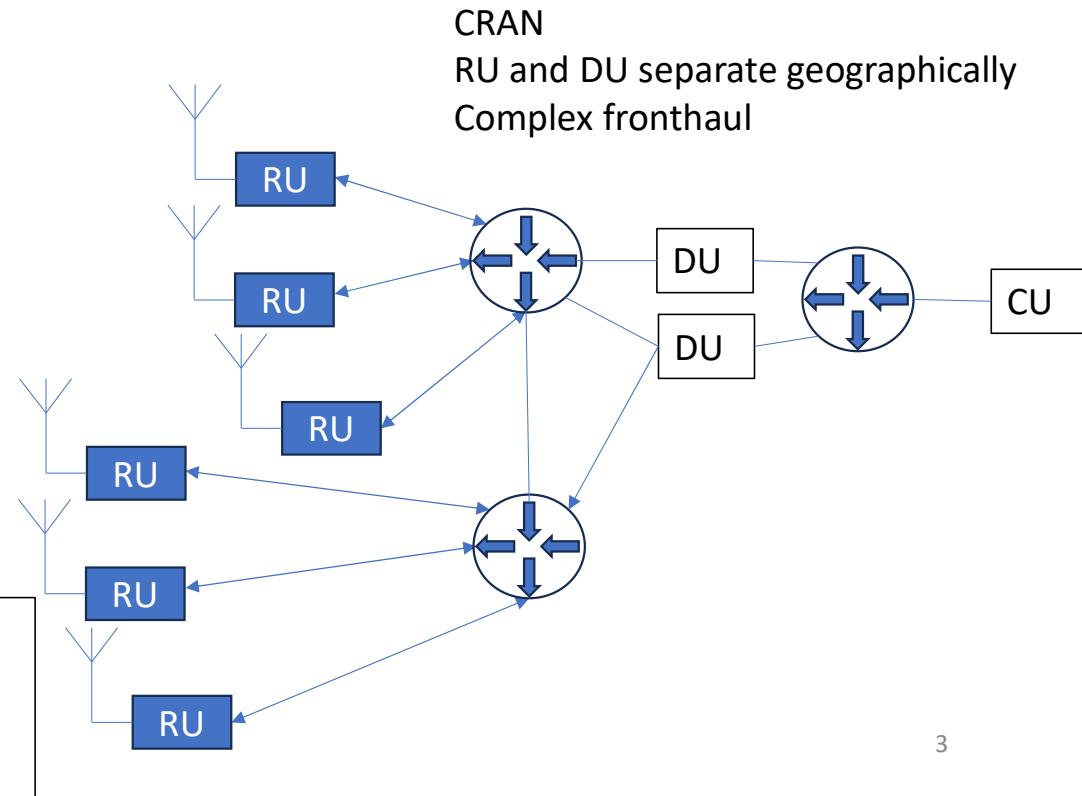
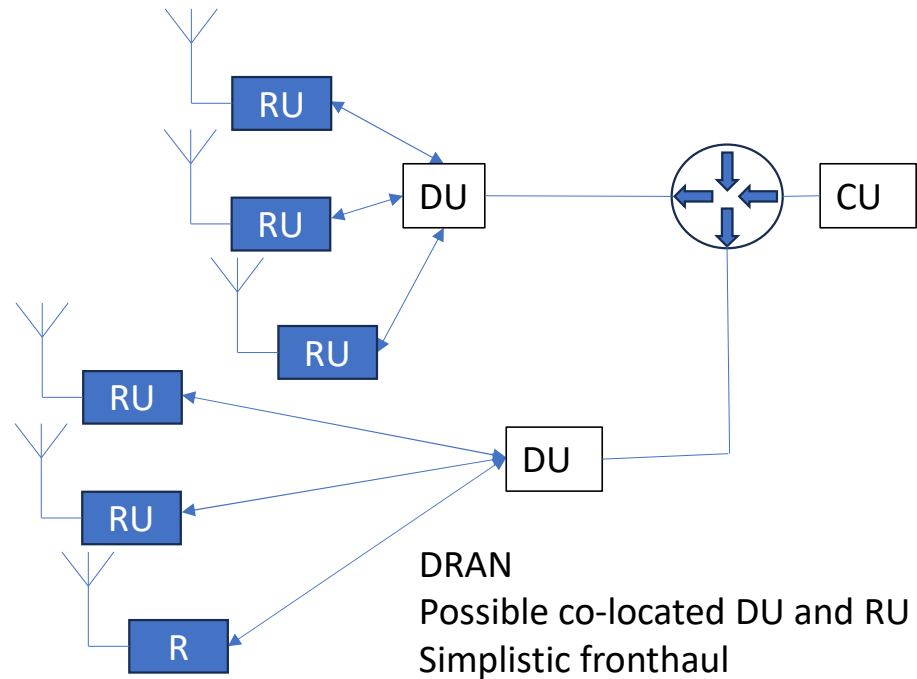


Time-Sensitive Networking for Fronthaul, 802.1CM

Mobile Networks of 2024 and beyond

- Mobile Networks i.e., 4G and 5G is mission critical for modern society
- Emergency and Public safety communication may utilize 4G and 5G networks

Mobile Networks, DRAN & CRAN

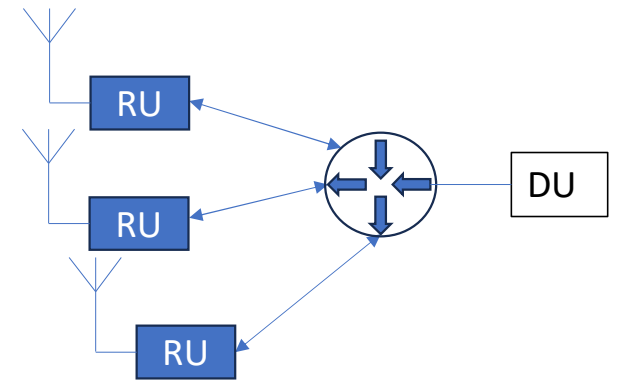


RAN - Radio Access Network
DRAN - Distributed RAN
CRAN - Centralized RAN
DU - Distributed Unit (eREC / REC)

CU - Central Unit
RU - Radio Unit (RE)

Fronthaul traffic types

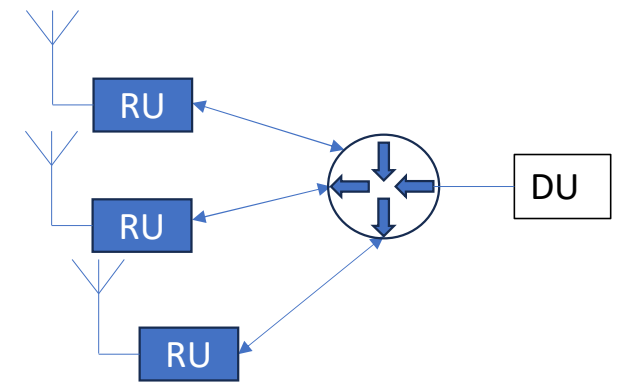
- User plane
 - I/Q Data in up- and down-link
- Control plane
 - Fast control of the radio transmission and reception in RU
- Sync plane
 - Allow synchronization of units within the RAN, radio transmission are subject to regulatory requirements
- Management Plane
 - O&M



Downlink – Data from RE towards User Equipment
Uplink – Data from User equipment towards RE

Fronthaul traffic

- User plane
 - I/Q data is integrity and confidentiality protected by air cipher; Unprotected information in transport and application headers
- Control plane
 - Unprotected information in transport, application headers and data
- Sync plane
 - Unprotected information in transport, application headers and data
- Management Plane
 - Optionally protected by IPsec/TLS/SSH



802.1CM

- Time-Sensitive Networking for Fronthaul,
 - 802.1CM was published in 2018
 - 802.1CMde Amendment was published in 2020
- 802.1 TSN Technologies contained in current profile:
 - Latency Components
 - Bridge delay calculation
 - Frame preemption
 - Network synchronization

802.1CM for Mobile Networks of 2024 and beyond

- To support the mission critical aspects of mobile networks, security and resiliency technologies is needed.
- Propose to secure C/U/S and M-plane with MACsec, add MACsec to 802.1CM
- Propose to add resiliency to fronthaul networks, add LAG to 802.1CM

Thank You