INPUT TO VTC PANEL ON SOFTWARE DEFINED NETWORKS AND SERVICES

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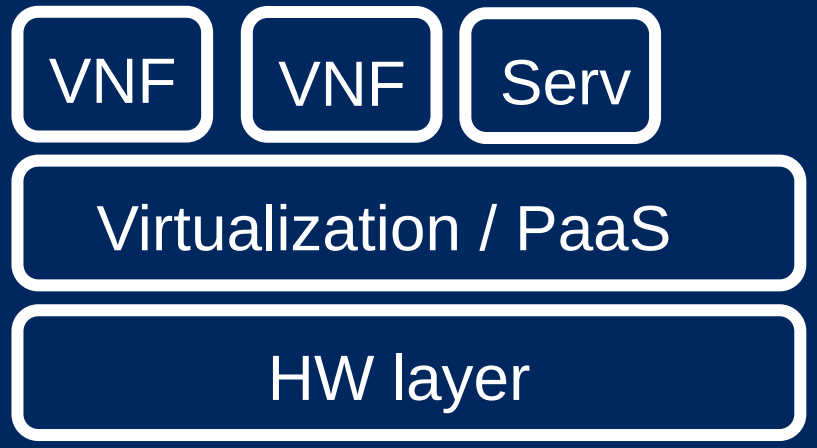
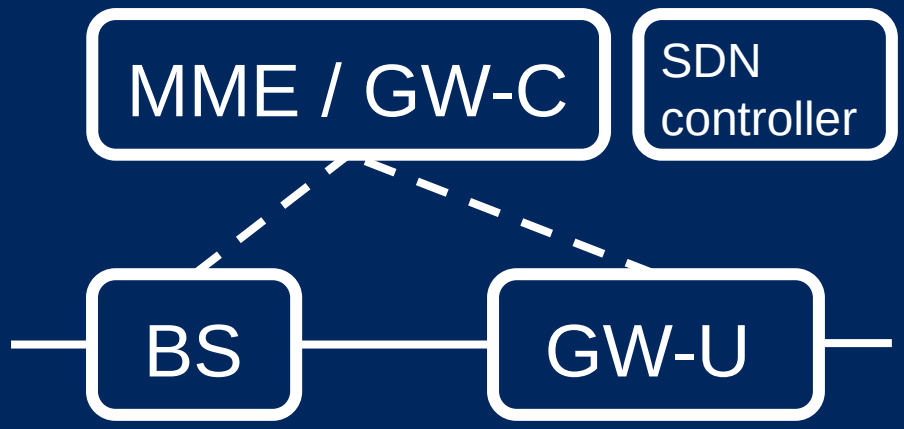
PACKET CORE TRENDS

Network Function Virtualization



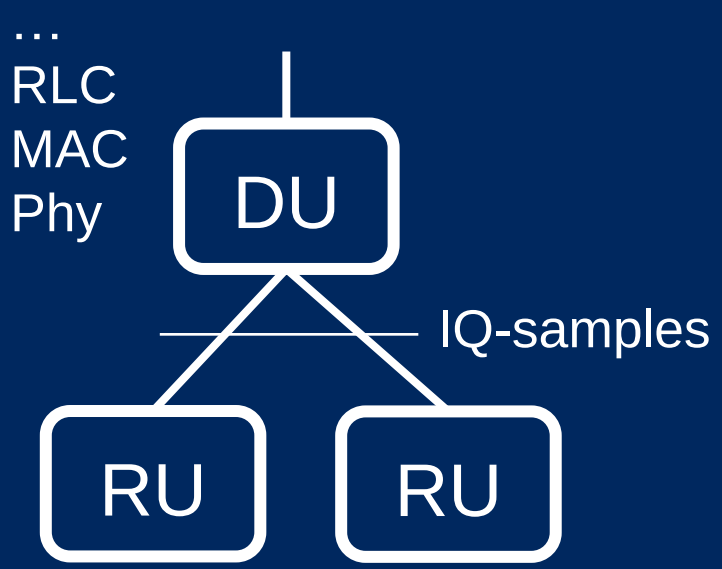
UP/CP split, SDN



- Flexible deployment of Core/Service layer functions
- New ways to scale, handle redundancy, orchestrate
- Fine grained flow separation in HW or SW (policy controlled)
- Logical network slicing, separation, optimization

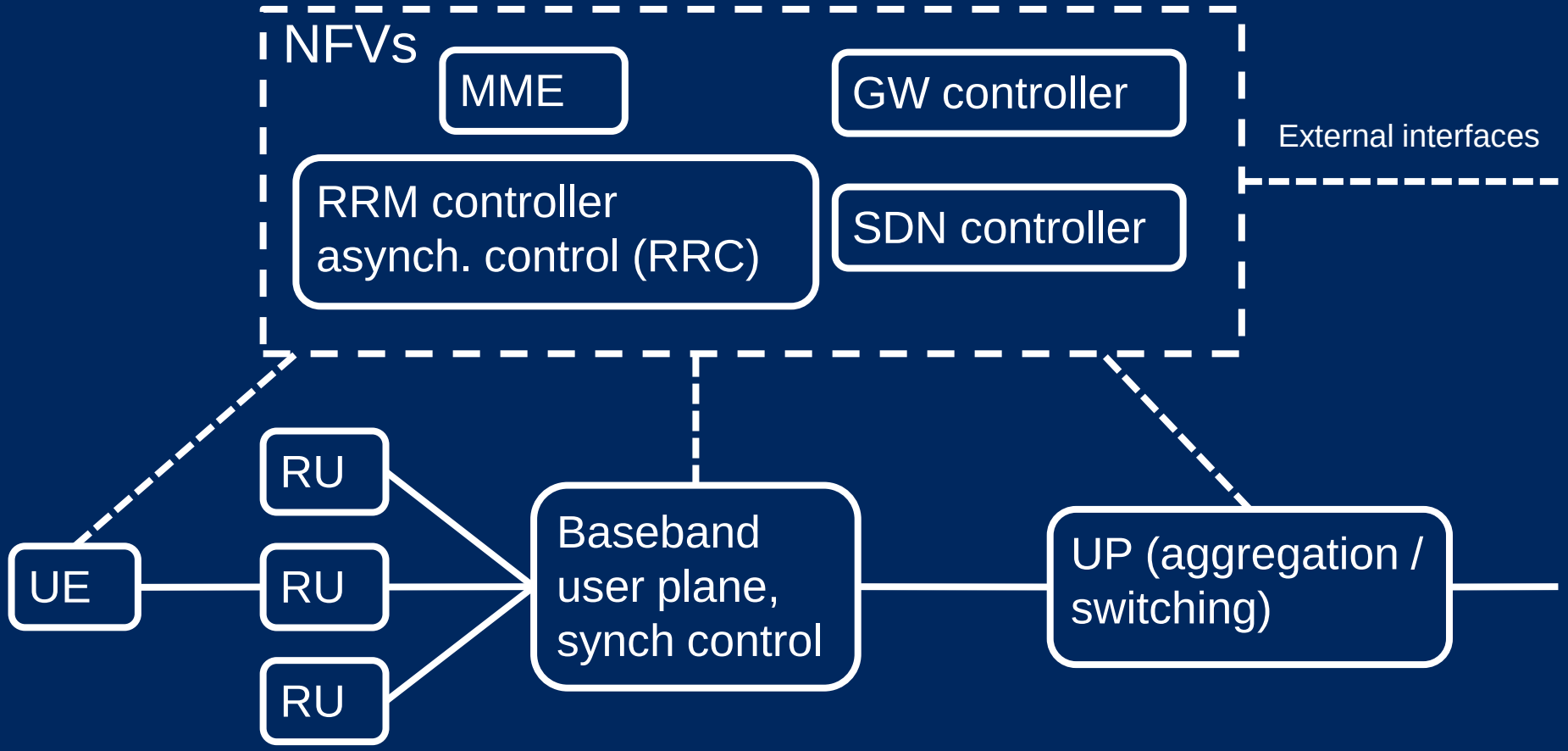
RADIO NETWORK ASPECTS (BACKGROUND)

Typical BS architecture



- Digital Unit (DU) handles all radio i/f processing (baseband), external i/f
- DU are software defined, e.g. supports multi-standards, new features deployed in SW
- Current limitations for centralization and virtualization
  - HW acceleration is used for HW and energy efficiency (e.g. L1 processing)
  - Time critical processing allows only for limited centralization (C-RAN)

POSSIBILITY FOR "WIRELESS SDN"



Separation of time critical, high volume BB processing from not so time critical asynchronous control and RRM

Simplify management / deployment, CRRM, multi-connectivity and aggregation

CHALLENGES "WIRELESS SDN"

- Coordination
  - Mainly targeting non time critical coordination features (e.g. inter-access load balancing) , common resource management
  - Time critical coordination (e.g. CoMP) will require baseband features
- Programmability
  - Most of the interesting radio network features (since LTE Rel-8) such as CA, MIMO enh, CoMP, …) hits all layers (UE, network, controller, baseband).
  - Difficult to add new features without standardization, especially for UE
- Standardization
  - Still needed for UE-Network interface , controller interface, external interfaces etc.
  - Driver for flat architecture was to simplify and reduce the number of network interfaces

CONCLUSIONS

- Ongoing evolution in core network functionality will enable more flexibility making it possible to optimize the performance for different 5G use cases
- Wireless SDN is an interesting topic, but it needs to move beyond high level visions to more concrete problems and solutions
- To fully utilize a programmable RAN we need more programmable UEs and more flexible standards