NGFI reference architecture discussion

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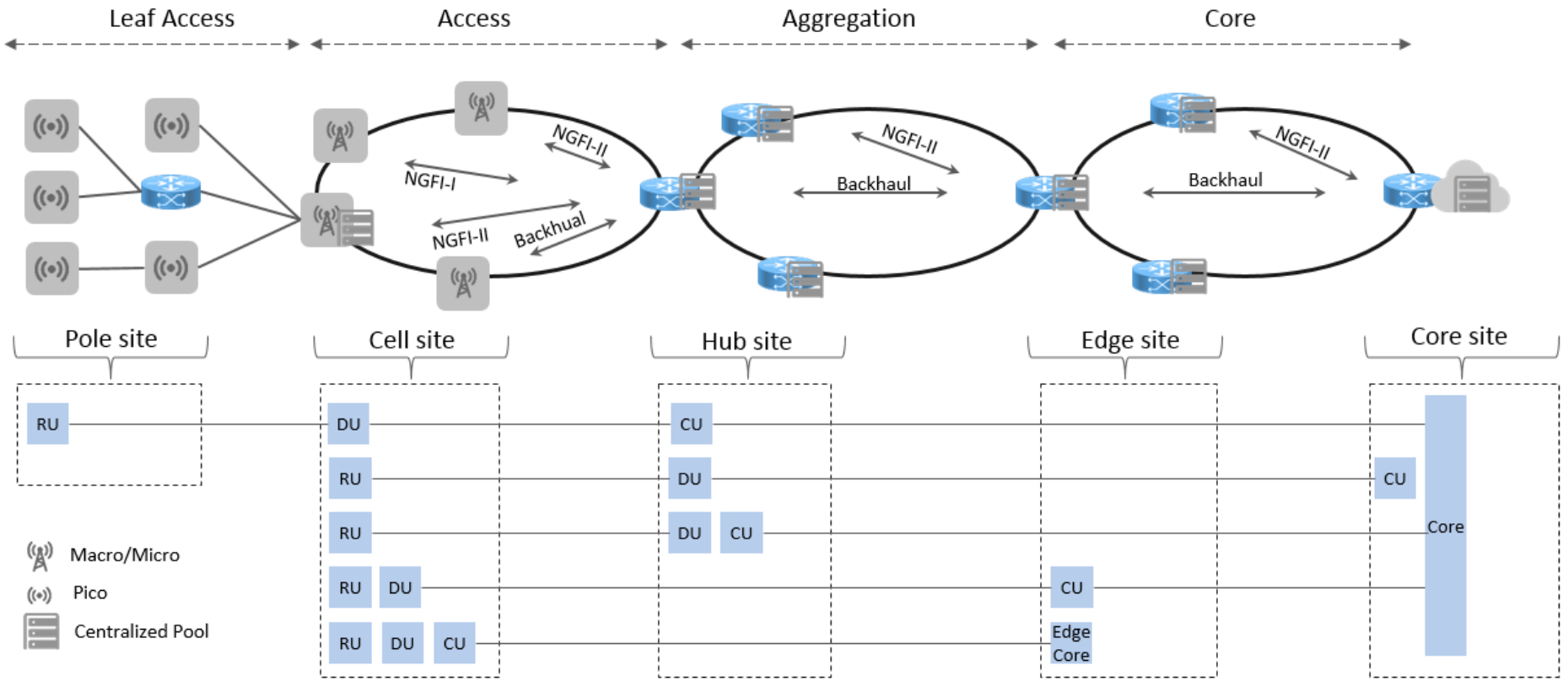
Background

- Figure 2 and 3 in D3.0 Draft is still seen redundant and carry similar information but not with full alignment
- First paragraph does not fully match the description needed for the figure and ought to be modified.
- Proposals
  - consolidate the two figures into one for simplicity and concise purpose
  - Update the description text

Information to be carried from the figure

- Hierarchical transport architecture
  - Core
  - Aggregation
  - Access
  - Leaf access
- Network function hosting nodes:
  - Data Center
  - Edge site
  - Hub site
  - Cell site (Micro/Macro/Pico)
  - Pole site
- Topology
  - Core/Aggregation/Access: ring to indicate more resilience
  - Leaf access: direct link to indicate less resilience
- Transport overlay
  - Define NGFI-I/II in section 6.1
  - Core/Aggregation: coexistence of NGFI-II/backhaul
  - Access/leaf access: coexistence of NGFI-I/NGFI-II/backhaul
- Flexible site hosting options
  - Data Center: Core, CU
  - Edge site: Edge core, CU
  - Hub site: DU, CU, (DU+CU)
  - Cell site: RU, DU, (DU+CU)
  - Pico site: RU

Proposed merge of Figure 2 and 3



Non-exhaust host options on each site

Proposed Text for section 6.2

Before Figure 2

The NGFI network is hierarchical and copes with both 4G and 5G technologies. Figure 2, shows a high-level view of the architecture, where three main network spans can be logically identified: Access, Aggregation, and Core. The Access network, which is close to the radio transmission points, aggregates transport traffic from cell sites (such as Macro, Micro, or Pico) into a Hub site for centralized processing. The Aggregation network further aggregates traffic from Hub sites into Edge sites. Similarly, core network collects traffic from more Aggregation networks. Further at edge, also possible connected is a leaf access network that links the pole sites for C-RAN based pico deployment. Ring network topologies are common for Access, Aggregation, and Core networks due to resilience purposes; however, other topologies are also possible. The leaf networks are often point to point topologies with less resilience.

Along the transport infrastructure, 4G/5G RAN entities, such as RU, DU, CU and BBU, are located differently cross cell sites up to core site, according to possible split options and the actual scale of the network. Moreover, CU itself may be further disaggregated to split control plane processing and user plane processing into separate location sites (e.g., for aggregated user plane processing, latency reduction, etc.). Location of DU, may also be deployed at multiple separate locations as well. This allows to identify different scopes of transport network with respect to the mobile service carried, generally referred as NGFI-I and NGFI-II, and backhaul.

Proposed Text for section 6.2

After Figure 2

The addressed functional split option results in different integration profiles implementable between RAN entities: 1) independent RU+DU and CU, 2) DU integrated with CU and connected to RU, and 3) DU integrated with RU then connected to CU, 4) RU, DU, and CU at same sit, with all scenarios illustrated in the Figure 2 for various hosting options across the sites.

Consistently, mobile controllers entities, such as evolved packet core (EPC)/5G core network (5GC), can also be placed or distributed at both edge site and core site. Figure 3 gives a more detailed view on the chance to flexibly locate baseband blocks across end-to-end network sites.

The NGFI reference architecture assumes that all radio deployment use cases can leverage the same transport network infrastructure. This implies that both new and legacy radio technologies may coexist in the same cell site and the transport infrastructure has to carry legacy backhaul, legacy fronthaul, and 5G multiple functional split options to meet different requirements.