Notes on the Technical Priorities (Release 4)

UNDER THE OPEN RAN MOU

by Deutsche Telekom, Orange, Telefónica, TIM and Vodafone

This document has been released together with the fourth release of technical priorities by the signatories of the Open RAN MoU. Its purpose is to summarize supplementary notes on the priorities and the content of the technical priority updates for the reader's better understanding.

1. Treatment of MoU technical releases

Note this fourth release of technical priorities covers all the Open RAN MoU technical releases, i.e., MoU Releases R1, R2 and R3. For more details on the structure of the four Open RAN MoU technical releases, please refer to the "Notes on the Technical Priorities (Release 2)".

2. Perception of technical priorities

The technical priorities by the MoU signatories are meant to giveguidance on operators' needs to new market entries. The technical priorities (i) serve as guidance to the RAN supplier industry on where they can focus to accelerate market deployments in Europe, focusing on commercial product availability in the short term, and solution development in the medium term, and (ii) are intended to act as an input into TIP's OpenRAN Release Framework, which can then be developed with the industry at large to create requirements that can potentially be used as the basis for certification, promoting an efficient supply chain. Additional information is available on TIP's website here: https://telecominfraproject.com/openran-mou-group/.

The technical priorities are intended as guidance on priority and do not represent any alignment on procurement. The signatories welcome and expect competition between suppliers to drive innovation and the development of solutions with greater performance then those described in the technical priorities. Individual signatories are free to, and may well, demand more stringent requirements in their own product selection processes than those set out in the requirements.

3. Release notes

The fourth release of the technical priorities has primarily focused on developing further requirements on SMO, Security and Cloud infrastructure, while other areas have been significantly enhanced such as RAN software, O-RU and O-CU/DU

Moreover, this new release focuses in more detail on RAN hardware acceleration topics and various challenges related to the two look-aside and in-line acceleration card models. In particular, the RAN HW acceleration requirements are now contained within a dedicated section of the MoU Technical Priorities document.

This fourth release embraces 4 documents:

- The present "umbrella" document, describing the mapping of the technical requirements to the 4 MoU releases and giving a brief summary of the content.
- The Security MoU Zero trust approach commitment
- The Security MoU requirements for security certification
- The full Technical Priority Document in Excel format

The security MoU Zero Trust approach commitment document shouldbe seen as a positioning paper providing guidance on architecture which is recommended in future implementations.

In addition, the Security MoU requirements for certification document aim to highlight the need of having a security certification process with a proposal to ease its start.

The full Technical Priority Document provides an update of the third release document (released in April 2023), covering both updated and additional requirements. As a reminder, note that a naming convention was introduced in the third release to facilitate the unique identification of requirements between different releases and among the various streams (details provided in the Technical Priority Document).

While all areas have been revisited, the most significant updates have been performed in the following areas:

- SMO: Since the third technical requirements release, the Non-RT RIC requirements are part of the SMO technical requirements. This year, the focus is made three main topics:
  - AI/ML Framework: The group advanced the AI/ML framework for model training interaction and integration of the SMO, as well as the specific monitoring of a model's behavior.
  - Interworking with traditional RAN: The transition phase and virtualizations steps are ongoing but cycles for legacy hardware replacement are long. Since the SMO, Non-rt-RIC and rApps (which already exist for non-Open RAN) are more advanced in terms of full OSS incorporation, the MoU group recommends among others that the traditional RAN should also be represented in the TE&IV, and use the same functions interfaces as for Open RAN.
  - Slicing: requirements were added related to interaction of rApps and the R-NSSMF and the mastership and synchronization of respective RAN parameter, which also relates to the Conflict Management.

  For the next Release MoU group intends to update the SMO architecture (available in the Release 3) related to the decoupled SMO Architecture introduced in O-RAN ALLIANCE, and to provide requirements on the Digital Twin, License Management and Software (LCM, energy efficiency….) for Hardware acceleration.

- RAN HW acceleration: There exist different options to support RAN HW acceleration such as full L1 layer offloading (inline) or partial L1 offloading (look-aside). Nevertheless, support for both options is not widely endorsed in the industry by RAN SW and infrastructure vendors, who are choosing between these two to develop and implement their own stack. Standardization bodies are working on defining a framework (O-RAN ALLIANCE WG6-AAL) that will facilitate integration of both alternatives and even possibly support seamless transition from one option to the other one: however, this is still in early stages. MoU operators defined a list of technical requirements related to RAN acceleration to align industry with a set of common needs aiming at contributing to the evolution of the ecosystem towards fulfillment of these requirements. These requirements can be summarized as follows:
  - **HW/SW decoupling and abstraction at different levels** (HW and SW and among different SW levels, e.g.: CaaS) (i.e., following the O-RAN AAL approach and the AAL interfaces specifications).

- **Multi-RAT support** (i.e., 5G and 4G, with flexible distribution of compute capacity between RATs).
- **Multi-vendor support** facilitating SW portability and integration across different HW using open interfaces (e.g.: DU-L1 and DU-L2).
- **Power consumption optimization** (e.g., based on traffic load).
- **Network connectivity capabilities** (i.e., I/O ports and speed; Time sync capabilities, and PCI form factor variants)
- **Independent lifecycles between hardware and software**

Operators require technology and vendor agnostic solutions. Their choice for a specific solution for RAN HW acceleration relies only on best-of-breed technology regarding performance, energy efficiency, hardware footprint, and technology evolution. Thus, MoU operators' short-term assessment is ecosystem should evolve fulfilling these requirements to facilitate and embrace the principles of Open RAN, such as openness and multi-vendor approach. In parallel, but medium to longer term, MoU operators will suggest for introduction of more capabilities such as AI/ML functions, advanced automation and silicons integration to enhance and optimize physical layer.

- Cloud Infrastructure, with new requirements on O2 Interface and Acceleration Abstraction Layer (AAL) added according to latest O-RAN ALLIANCEWG6 specifications. Enhanced requirements on O-Cloud platform and energy efficiency were also included in this new release.

- RAN Software, with several new requirements on feature enhancements from 3GPP Release 17 and 18.

- O-RU, with the addition of new radio products (new bands of interest, new power requirements, etc.) and changes in priorities in multiple radio models compared with previous release. There have been changes in the energy efficiency levels expected from operators.

- O-DU/O-CU: New requirements have been outlined for Network Interface Cards (NICs), addressing inline L1 Acceleration option and standard PCIe—based NICs with description of required capacity and FH ports. Additionally, specific requirements have been introduced to enhance performance in centralized scenarios where multiple O-RUs are connected to different O-DUs. Key aspects include load balancing, traffic splitting, SMO interface integration, and cluster scheduler awareness.

- For the Near RT RIC three additional requirements have been considered taking into account updated O-RAN specification and Y1 interface introduction.