Telecom Infra Project: Project Group Charter

Date of Approval by TIP Board of Directors: 1 November 2017

This Project Group Charter establishes the scope, intellectual property and copyright terms used to develop the materials identified in this Project Group. Only Participants that execute this Working Group Charter will be bound by its terms and be permitted to participate in this Project Group, and shall be considered "Contributors" in the Project Group as defined in the Telecom Infra Project IPR Policy document.

1.   Project Group Name. ***OpenRAN – Enabling Open Ecosystem of GPP-Based RAN Solutions***

2.   Purpose. **This project will focus on implementation of RAN solutions that can be deployed on General Purpose Processing Platforms thus enabling a sustainable development stream. This project will help enable an open ecosystem of complete solutions and solution components that take advantage of the latest capabilities of General Purpose Processing Platforms, both at a software level and also using programmable offload mechanisms such as FPGAs. The main objective of this project is to have RAN solutions that benefit from the flexibility and pace of innovation that are associated with software-driven developments on fully programmable platforms are deployed as outcomes of the project group.**

3.   Project Group Scope. The project scope will be complementary with other projects already at play in TIP and will focus on disaggregation of virtualized RAN solutions into different components and ensuring each individual component can be efficiently deployed on GPP platforms:

- Start with 4G RAN Solutions but looking forward also 5G at a later phase (e.g. when 3GPP 5GNR specification is complete)

- Define a reference framework/software architecture that decomposes LTE eNB into individual blocks and components, with a primary focus on L1.

- Identify the blocks/components that do not include any vendor-specific IP and generate optimized software implementations

- Identify the components and/or algorithms that can benefit from offloading to programmable accelerators such as FPGA

- Define set of APIs to abstract underlying hardware resources

- Identify minimum requirements for General Purpose Processing Platforms to ensure efficient performance

- Identify specific requirements for Virtualized Environments (e.g. Real-Time)

- Demonstrate the performance achieved on different types of GPP Platforms (e.g. with and without FPGA)

- Demonstrate multivendor RAN Solutions, where each solution is comprised of 1 or more HW (Processor) vendor and 1 or more SW vendor

- Create prototypes that can be rolled into product design for scale deployments

4. <u>Project Group Deliverables.</u>

- Reference framework/architecture for implementation of eNB stack on General Purpose Processing Platforms
- Reference (and optimized) implementation of the basic building blocks and algorithms, both as software libraries and FPGA RTL
- Hardware Abstraction Layer, including APIs, to abstract from application vendors the underlying hardware platform capabilities
- Defined KPIs and traffic model as part of the reference implementation
- Orchestration framework to manage and provide operational capabilities
- Carrier-grade lab proof-of-concept of multi-vendor open solutions
- Field trials to commercial, championed by at least one Comms Service Provider, for at least one of the use cases - high density locations in indoor environments, rural broadband connectivity, and multi-operator/neutral host. TIP Lab trials within 6 months and Field trials within 12 months of accepted use case.
- Benchmark report and TCO analysis with performance metrics for various types of configurations
- Recommendation for minimum set of platform requirements (both HW and OS Layers)

5. <u>Patent Licensing.</u> The patent license for all Contributions, Draft Specifications and Final Specifications within this Project Group shall be: *[Check one box]*

☒ <u>RAND License Option,</u> as set forth in Section 5.2.1 of the Telecom Infra Project IPR Policy.

☐ <u>Royalty-free License Option,</u> as set forth in Section 5.2.2 of the Telecom Infra Project IPR Policy.

6. <u>Final Deliverable Copyright Licensing.</u> Project Group agrees to grant the following copyright license for the Final Specification: *[Check one box]*

☒ <u>Creative Commons Copyright Attribution 4</u>, Each Project Group Contributor agrees that its Contributions are subject to the Creative Commons Attribution 4.0 International license - http://creativecommons.org/licenses/by/4.0/legalcode.

☐ <u>Full Release of Copyright into the public domain,</u> Each Project Group Contributor agrees to release its Contributions to the public domain and waive all copyrights associated with them.

7. Initial Project Champions.

Vodafone and Intel

8. (Proposed) Chair and/or Co-Chair of Project.

- Chair - (Vodafone)
    1) Andrew Dunkin (Andrew.Dunkin@vodafone.com)
    2) TBC
- Co-chair – Intel.
    1) Jianli Sun (jianli.sun@intel.com): Technical
    2) Adnan Boustany (adnan.boustany@intel.com): Marketing

9. Participation Criteria. (this criteria is identical to SI project)

- Fit of the proposed contributions to the project group scope
- Technical fit of the proposed contributions to the architectural framework of the project group
- Commitment to contribute a non-proprietary open solution or open extension / API
- Productive interaction with a system integrator

PARTICIPANT SIGNATURE

_____   _____

Signed name   Title

_____   _____

Print name   Company Name

_____   _____

Email address   Date