TELECOM INFRA PROJECT

Open Core Network (OCN)

This Amended and Restated Project Group Charter establishes the scope, intellectual property and copyright terms used to develop the materials identified in this Project Group. Only Participants whose Authorized Representative executes this Project Group Charter are permitted to participate in this Project Group in accordance with the TIP Bylaws.

TIP Board of Directors Approval Date: February 23, 2022

Term: The Project Group shall commence on the date this Charter is approved by the Board ("***Formation Date***") and shall terminate automatically one year from the Formation Date unless the TIP Board of Directors votes to extend the Term for a subsequent 1-year term. The TIP Board of Directors may extend the Term an unlimited number of times.

1. PROJECT GROUP NAME & TYPE

- NAME: Open Core Network
- TYPE: Product Group

2. OBJECTIVES

The Open Core Network group is to drive development of working to develop an open, cloud-native, and converged core that is a collection of microservices implementing various core network functions ("open, flexible and extensible"):

- running on standardized software and hardware infrastructure ("infrastructure agnostic"),
- supporting 3GPP 5GC and EPC (licensed), Wi-Fi (unlicensed) and shared spectrum (e.g., CBRS) networks ("access agnostic"), and
- enabling seamless migration from 4G EPC to 5GC in both NSA and SA modes (but no 2G or 3G access support).

The goal is to innovate on the packet core technologies across 4G, 5G and WiFi access networks operating on licensed, unlicensed and shared

spectrum; foster ecosystem to develop microservice, orchestration and automation frameworks on OCN platform, and support an ecosystem of developers, OEMs, SIs, MNOs, and ISPs around OCN based solutions. OCN PG also intends to identify the next phase of connectivity problems by exploring new use cases and their requirements on end-to-end communication services, supporting the ecosystem to develop products and solutions through test and validation.

5G enables new use cases creating business opportunities for MNOs, cloud providers, SI, NEV (network equipment vendors), and enterprises.

- 5G FWA presents an attractive alternative to connect unconnected
- Operators are exploring new services beyond mobile broadband to enhance consumers experiences, and private networks to address enterprise market segments
- Cloud service providers use their edge assets to drive IoT/private networking
- Niche service providers and enterprises see opportunity in 5G with the new spectrum policies (e.g., CBRS in the US, dedicated regional/local spectrum allocation in Germany)
- Data center infrastructure providers and Tower Co's keen to extend value of their assets, leading to new business and deployment models for core networks

Unlike mobile broadband services, these new use cases tend to have a fragmented market, each use case in each market segment may have a set of different requirements. For their business case to work, the core network must be simple to deploy, easy to operate and manage, agile to feature introduction, and cost efficient to own. All these call for innovation.

3. PROJECT GROUP SCOPE

Working with Mobile operators, communication and/or cloud service providers, vertical enterprises, OEMs, software developers and system integrators, OCN PG shall:

- Select and prioritize use cases based on input from operators, service providers and vertical enterprises,
- Define and aggregate requirements of the prioritized use cases on core network and from an end-to-end perspective,
- Support technology suppliers to mature their products, which can be based on open source or closed-source development or a hybrid of both, through lab testing and field trials

- Applying TIP T&V process, vendor products meeting OCN requirements to support the selected use cases can be awarded with ribbon and badges, and be listed on TIP exchange,
- Produce blueprints, playbooks can be published to promote experience sharing among TIP community members,
- Participate webinars and industrial conferences and publish white papers to promote OCN

4. PROJECT GROUP DELIVERABLES

TIP may develop up to four types of Deliverables: Documents; Test Materials; Software; and in rare instances, Specifications. Intellectual Property Rights for each type of Deliverable are governed by a different policy or agreement, in each case approved by the TIP Board of Directors. The applicable policies or agreements are specified in the table below along with any procedures for approval and/or release of each Deliverable the Project Group intends to develop. All such policies and agreements may be found with TIP's Organizational Documents at:

https://telecominfraproject.com/organizational-documents/ unless otherwise identified **and attached** to this PG Charter. No Project Group may develop Software without forming a separate Project Group using the TIP Software Project Group Charter Template.

Deliverable	Deliverable Type	IPR Treatment	Approval Procedures
Use Case Definition and High-Level Requirements	Document	Document IPR Policy	Versions by consensus of the Project Group; final approval by the Technical Committee
Architecture Design and Detailed Requirements Document	Document	Document IPR Policy	Versions by consensus of the Project Group; final approval by the Technical Committee
White Paper or Case Study	Document	Document IPR Policy	Initial version may be created in the Project Group, TIP Community Lab, or Field Trials; consensus driven approval in the Project Group, Lab or Trial; final approval by the Technical Committee if the PG chooses to publish

Minimum Viable Product (MVP) Definition Document (Operator or vendor)	Document	Document IPR Policy	Versions by consensus of the Project Group; final approval by the Technical Committee
Test Plan for use in Lab and Trial activities, Test Reports, Lab Exit Reports, Field Trial Exit Reports	Test Materials	Document IPR Policy	Initial version may be created in the Project Group, TIP Community Lab, or Field Trials; consensus driven approval in the Project Group, Lab or Trial; final approval by the Technical Committee if the PG chooses to publish
Playbook	Document	Document IPR Policy	Versions by consensus of the Project Group; final approval by the Technical Committee

Contributions to Deliverables and any license to use the Deliverable upon its finalization are governed by TIP's Organizational Documents which may be accessed here. The IPR policies and agreements referenced below are TIP Organizational Documents unless otherwise specified and attached to this Charter.

5. FOR DELIVERABLES WHICH ARE SPECIFICATIONS*

___Check if the PG is developing Specifications as defined in the TIP IPR Policy. All such Specifications must be listed in the table set forth in Section 4 and the IPR Treatment must reference this Section 5.
[***If not checked, the remainder of Section 5 should be left blank***]

PATENT LICENSING

The patent license for all Contributions, Draft Specifications, and Final Specifications within this Project Group shall be:

___RAND License Option, as set forth in Section 5.2.1 of the Telecom Infra Project IPR Policy.

___Royalty-free License Option, as set forth in Section 5.2.2 of the Telecom Infra Project IPR Policy.

FINAL SPECIFICATION COPYRIGHT LICENSING

Each PG Contributor as defined in the TIP IPR Policy agrees that to the extent that its Contributions are incorporated into the Final Specification it hereby grants TIP a copyright license in its included Contributions to release those included Contributions as incorporated into the Final Specification under the terms indicated below. [Check one box]

__**Option 1** as set forth in the TIP Supplemental Copyright Policy.
__**Option 2** as set forth in the TIP Supplemental Copyright Policy.
__**Creative Commons Copyright Attribution 4**. See http://creativecommons.org/licenses/by/4.0/legalcode.
__**Full Release of Copyright** into the public domain.

**THIS SECTION 5 IS NOT APPLICABLE FOR ANY OTHER TYPE OF DELIVERABLE*

6. PROJECT GROUP LEADERSHIP

CHAIR AND CO-CHAIRS

Orange ● Vodafone

INITIAL PROJECT CHAMPIONS

Orange ● Vodafone ● British Telecom ● Meta (Facebook) ● Amdocs ● Athonet ● Matrixx ● Wavelabs

7. PARTICIPATION CRITERIA

Eligible to Sponsors and General Participants who have elected to be Full Participants and are in good standing.

A TIP Participant who wishes to participate in this PG must have its TIP Authorized Representative submit an application at https://member.telecominfraproject.com/get-started. The TIP Authorized Representative is the individual identified in the applicable Participant's General Participation Agreement.

No Participant shall be a participant of this PG until and unless TIP notifies the applicable Authorized Representative in writing that the application submitted by such Authorized Representative has been approved by TIP.

8. CHARTER UPDATE

This Project Group Charter will be updated to reflect any changes as set forth in the Project Group Charter Revision Policy which may be accessed at https://cdn.brandfolder.io/D8DI15S7/as/q7rnyo-fv487k-2j33tl/Project_Group_Charter_Revision_Policy_-_Telecom_Infra_Project.pdf.

9. COLLABORATION AND COOPERATION

The group will be structured and managed as a single Project Group, with the option to create additional sub work streams as appropriate to meet community needs.

THE PROJECT GROUP WILL CONSIST OF TWO WORK STREAMS:

1. **(Workstream #1) Applications and Services:** identify and define use cases, their end-to-end requirements as well as core network technology to support design, development, and delivery of a set of production-grade microservices implementing 3GPP 4G/LTE, 5G, shared spectrum (e.g. CBRS) and Wi-Fi core network functions and APIs between such functions as well as between these functions and RAN elements or Network Management Systems.

2. **(Workstream #2) Orchestration and Automation:** To promote use of web-scale technologies to design, develop and deliver an orchestration and automation framework for integrating, deploying and managing OCN microservices, including FCAPS, metrics, analytics and monitoring for OCN microservices. It also includes support of continuous testing and continuous deployment (CT/CD) of open core networks.

WORKSTREAM LEADS

Applications and Services: Orange ● Meta

Orchestration and Automation: Vodafone ● Amdocs

10. PG Procedures

The applicable PG Procedures for this OCN PG are included as Exhibit 1 to this Charter.

[3] Modifications to a Charter or Revised Charter that merely change the names of the PG Leadership, correct typographical errors, and make other similar non-material changes may be made by TIP at any time and are not subject to the PG Charter Revision Policy 4. If there are any, TIP legal counsel must be consulted before the Charter is submitted to the Board for approval.

ACCEPTANCE

Contact Name

Contact Title

Email

Telephone

Company Name

Company Address/City/State/Country/Postal Code

Company Website URL

Primary services or product company provides

Signature

Date

Signed by (print name)