A New Approach to Telecom Networks: A Focus on TIP Community Labs

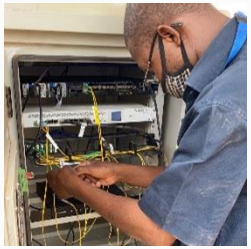
Presentation for CW, Small Cell Group: Open RAN Event
12 October 2021

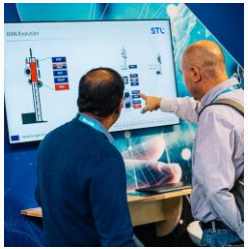
TELECOM INFRA PROJECT

Agenda

1. Telecom Infra Project
2. From Ideation to Testing, Validation, and Deployment
3. TIP Community Labs: Case Studies
4. TIP Community Labs: Lessons Learned
5. Next Steps







What is TIP?

Founded in 2016, TIP is a community of diverse participants that includes hundreds of companies - from service providers and technology partners, to systems integrators and other connectivity stakeholders.

We are working together to develop, test and deploy open, disaggregated, and standards-based solutions that deliver the high quality connectivity that the world needs - now and in the decades to come.

Together We Build, Test & Deploy.

The Telecom Infra Project is a diverse community accelerating commercial adoption of open & disaggregated network solutions

1. Industry standards

3GPP · ONF · IEEE · oneM2M · IETF · TIA · O-RAN ALLIANCE

TELECOM INFRA PROJECT

SERVICE PROVIDERS · TECHNOLOGY PARTNERS · SYSTEM INTEGRATORS · CONNECTIVITY STAKEHOLDERS

Commercial deployments

2. Market demand

ctia · GSMA

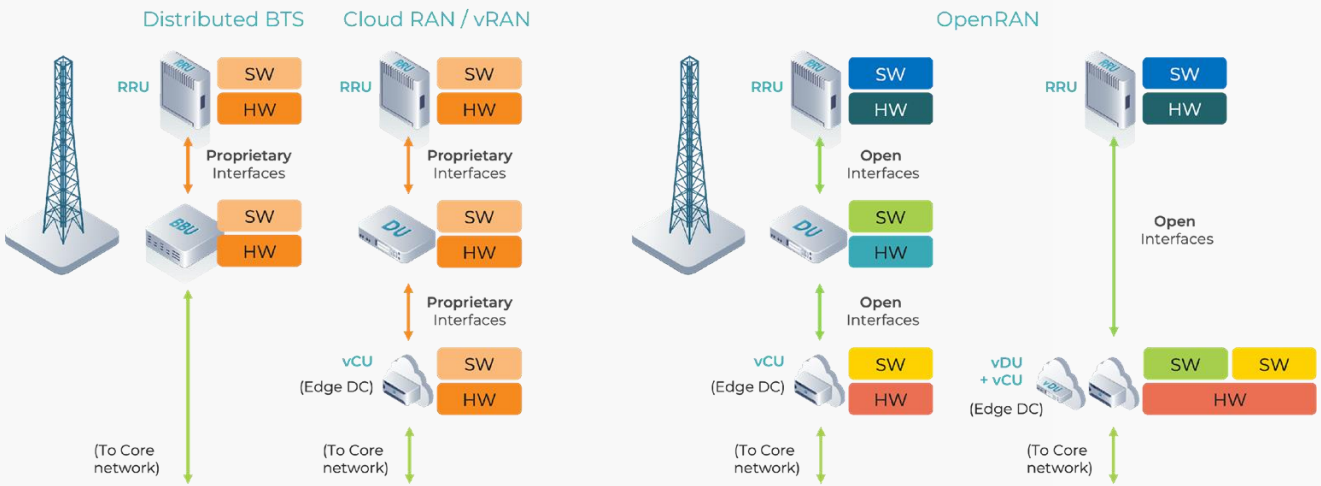
3. Software and lifecycle management tools

OPNFV · ONAP · OCP · openstack. · THE LINUX FOUNDATION

OpenRAN addresses the challenges to achieving greater, higher-quality connectivity

FROM: Single-vendor, fully integrated RAN

TO: Multi-vendor, disaggregated interoperable RAN

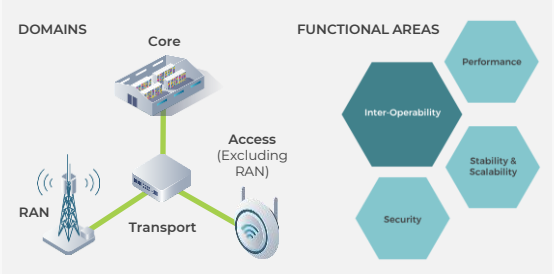


- Build a more **sustainable supply chain**
- Accelerate **innovation** in connectivity
- Improve network **economics**

How TIP Works

IDEATE → DEFINE → BUILD → TEST → RELEASE → DEPLOY

→ **Identify and prioritize use cases** and technical requirements against product availability



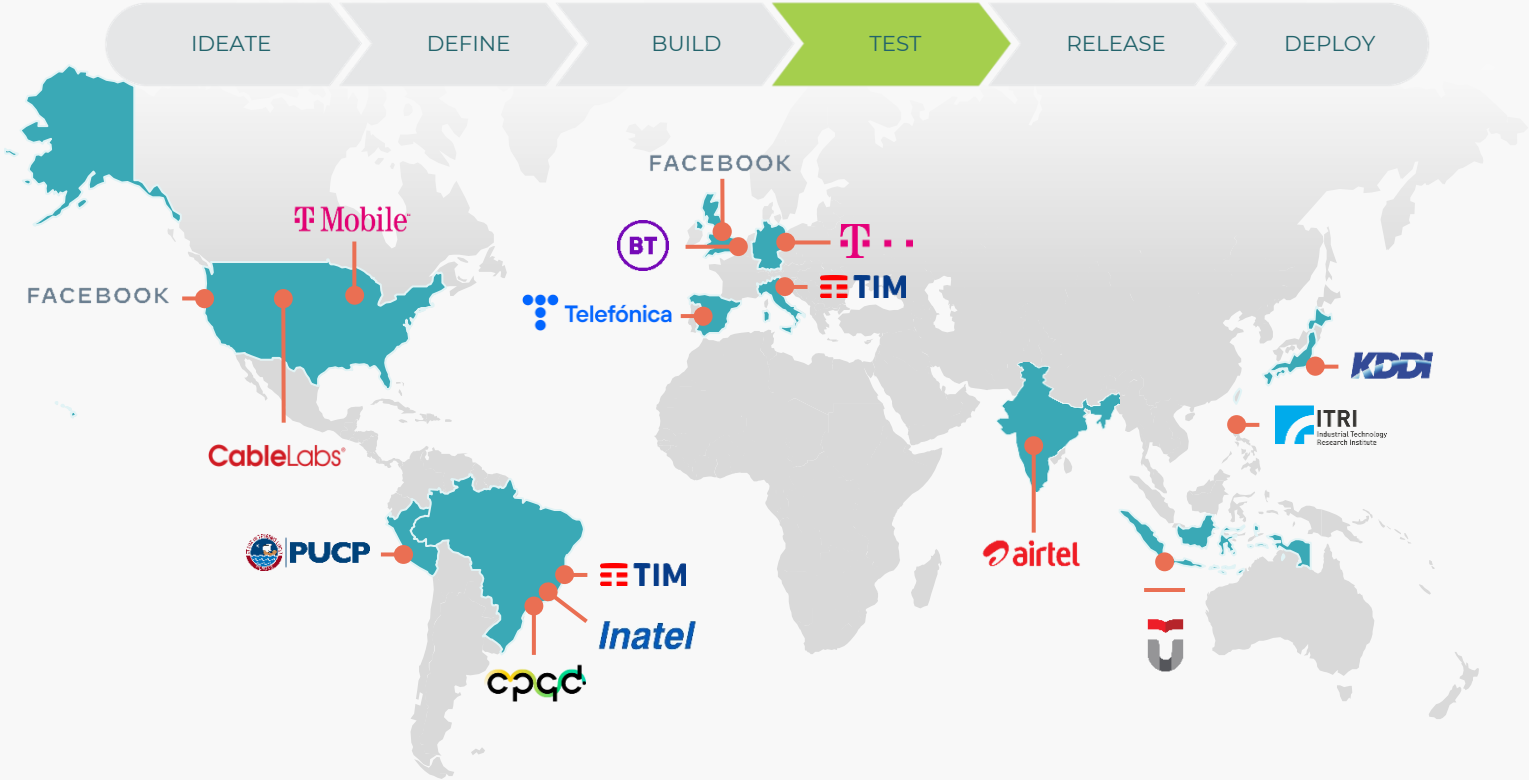
→ **Continuous testing and lab trials** to validate products and solutions

→ **Best practice sharing** and collaboration on field trials

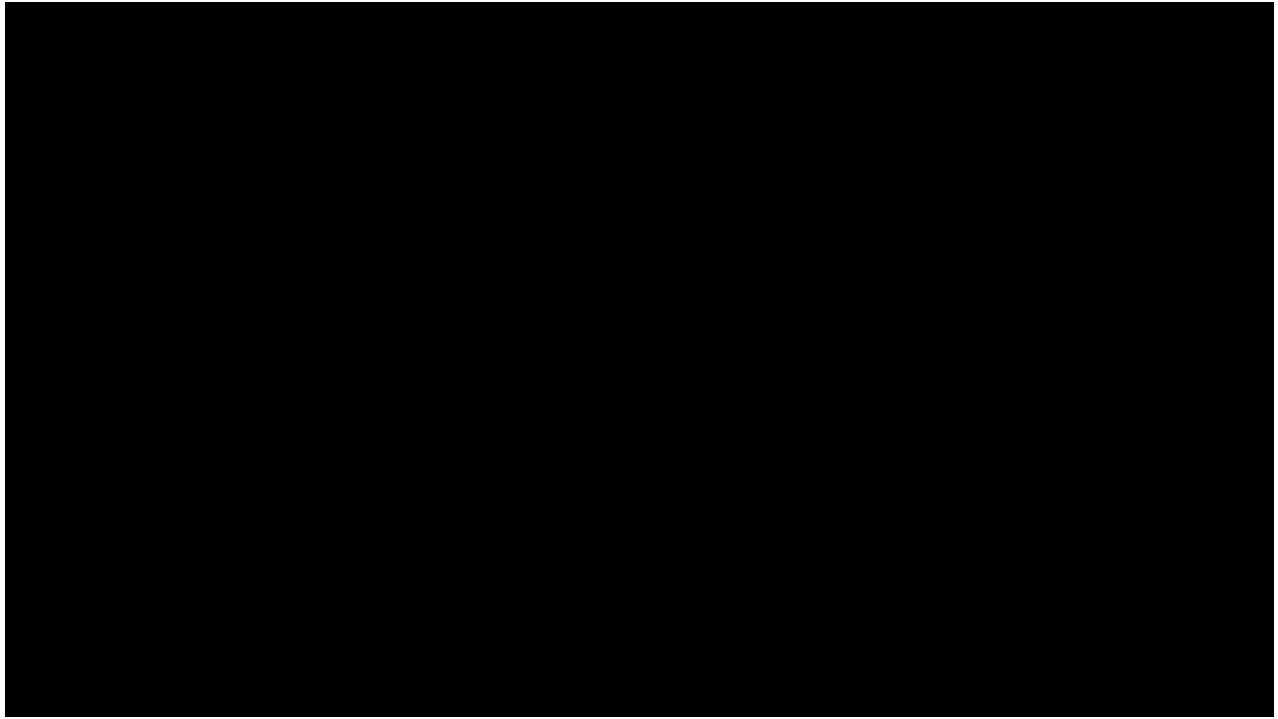
→ **TIP Exchange** is a marketplace of validated products and Blueprints enabling a path to deployment

→ **TIP Badges** (reflecting maturity)

TIP Community Labs: Testing, Integration, and Validation



TIP Community Labs: A Global Network



https://vimeo.com/440538745

TIP Community Lab

Telkom University, Centre of Excellence

Bandung, Indonesia

TIP Indonesia Program Pillars

In 2020, TIP launched a 5-year, 5-pillar comprehensive connectivity plan in alignment with Indonesian Government objectives

2020 ONWARDS (5 years Program)

Testing and validation of TIP promoted technologies

Operator commercial trials/deployments in Rural & Urban Indonesia

Dissemination of Learnings and Promotional Activities

Building local skills and capacity, in 4G & 5G assembly & system integration

TIP TEAC - Startup acceleration

CORE COMMUNITY

TELECOM INFRA PROJECT · GSMA · KOMINFO · BAKTI · Telkom Indonesia · TELKOMSEL · indosat ooredoo · smartfren. · XL axiata · Net1 INDONESIA · BERCA · 3

GROWING

Parallel WIRELESS · ALTIOSTAR · Baicells · MAVENIR · Comba · amdocs · DESAI · Red Hat · Techbros · KCCTech · IBM · Telkominfra

TIP Community Lab: Indonesia

Lab and field trials are the 1st pillar of TIP Indonesia program

Current Status:

- Completed 3 OpenRAN lab trials in cycle 1 with Telkomsel, Indosat Ooredoo and Net-1

Next Steps:

- Launch the next-cycle of activity, including exploring new trial use cases with MNOs, including:
  - Urban NaaS (MOCN) Indoor Small Cells
  - Rural NaaS (MORAN)
  - OpenRAN 5G
  - Private Network LTE
  - Private Network 5G
  - OpenCore
  - Open Optical Packet Transport
  - OpenWiFi

TIP Community Lab

Inatel – National Institute of Telecommunications

Santa Rita do Sapucaí-MG, Brazil

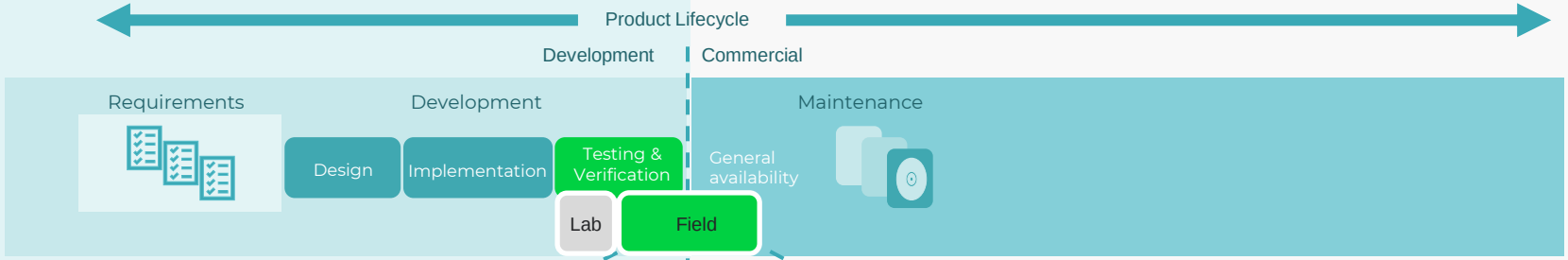
Open Field Program

Field Environment

For Pre-GA and GA Products

Workstreams

WS1 – Product Piloting
WS2 – Test & Validation
WS3 – Ecosystem Assessment
WS4 - Training
WS5 – xApp/rApp Development



Remote R&D

Workstream 1
Workstream 5

Workstream 2
Workstream 3
Workstream 4

OEM #1
OEM #2
OEM #3
OEM #4
OEM #5
OEM #6
OEM #N

Multiple OEMs running field testing & verification simultaneously

Neutral Host Campus

Friendly users

Field (friendly) environment

Local Experts

Benefits

- More robust products with improved SW quality
- Less maintenance and corrections for GA product
- Better user experience and Network KPIs
- Faster adoption of the technologies

Open Field Program

Collaboration Model

Win Win Business Model

Mobile Network Operator

Spectrum, SIM Cards, Technical Consultancy, Test protocols, data link etc.

Neutral Host

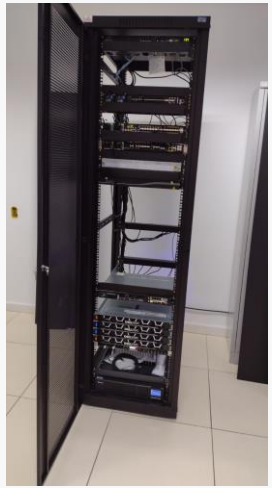
Campus, site infrastructure, friendly users, on-site support for installations, testing, optimization, etc.

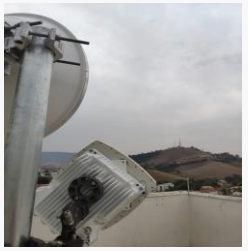
SW OEMs

SW (VNFs/CNFs, etc.), Remote support, own the KPIs

TIP

Overall project coordination, partner engagement, funding for HW, tools, marketing, playbooks and lessons learned.





TIP Community Lab

BT- Adastral Park

Ipswich, UK

TIP Community Lab: Ipswich, UK (BT Adastral Park)

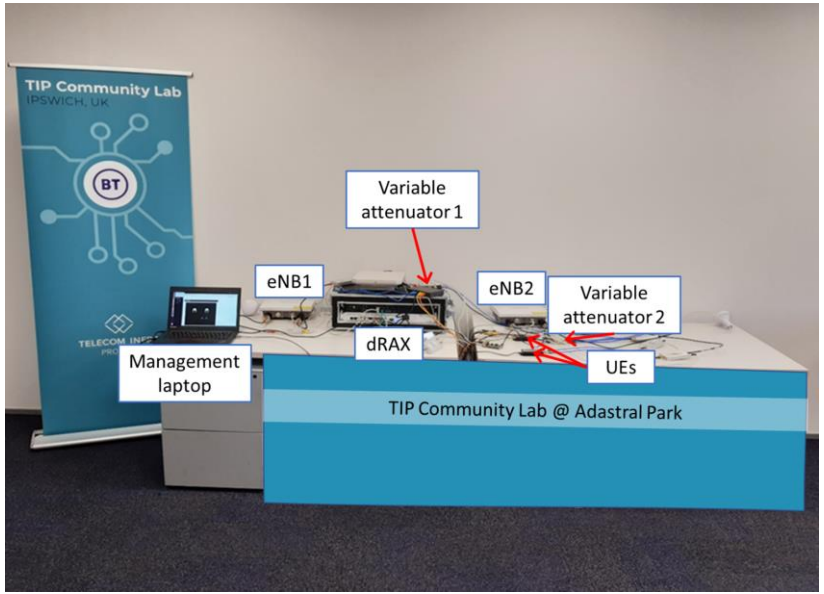
RAN Intelligent Automation Test & Integration

Current Status:

- Phase 1 Complete: Accelleran dRAX RIC platform CU/DU and indoor cells were setup and used to study interference management. Results will be shared in a White Paper for the global TIP community in late October.
- Ready to launch Phase 2, which will develop a predictive handover algorithm, taking into account expected user trajectory inferred from the Geolocation information.

Key Results from Phase 1:

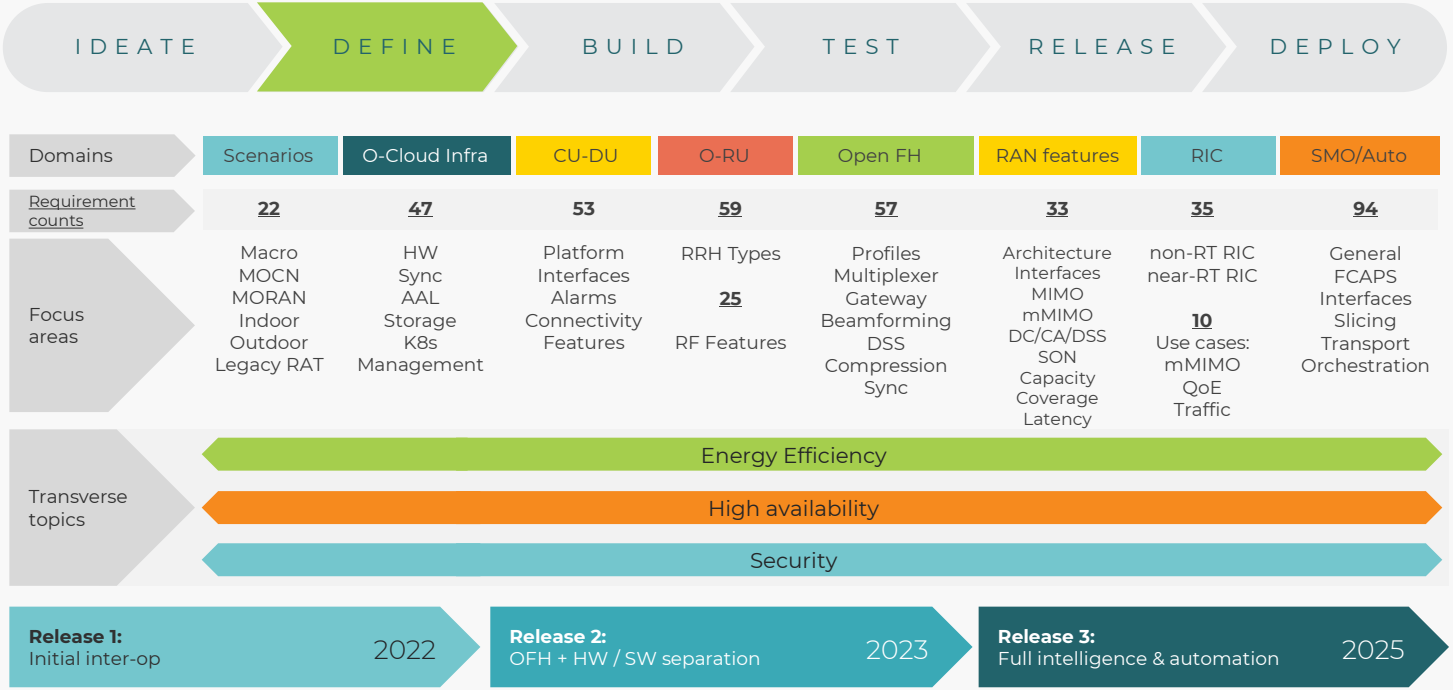
- Open APIs from Accelleran dRAX RIC platform allowed BT to develop their Smart Interference Management xApp
- Demonstrated the capability to dynamically adapt the sub-band allocations of interfering cells to improve the performance for edge-of-cell users.



TIP Community Labs: Lessons Learned

- Test and Validation driving productisation
  - Product level maturity is increasing
  - Interoperability and integration still major focus of testing
  - Need to move towards continuous and automated testing
  - AI/ML will play an important role in OpenRAN
- Labs Can Adopt a Range of Formats Depending on Unique Needs & Local Context
  - Incorporation of training program
  - Open sandbox for trials with access to spectrum and OTA capabilities
- Policymakers Play an Important Role in Fostering Innovation
  - Can exercise power to convene
  - Offer incentives for open technology deployment
  - Support regulatory sandboxes for innovation and trials
- Disseminating Lessons Benefits the Global Ecosystem
  - Sharing learnings, infrastructure blueprints, and best practices and coordinating among testing initiatives can help **create greater efficiencies** for the ecosystem by **eliminating redundancy**, **maximising the output of test learnings**, and leveraging local learnings for the benefit of the global community

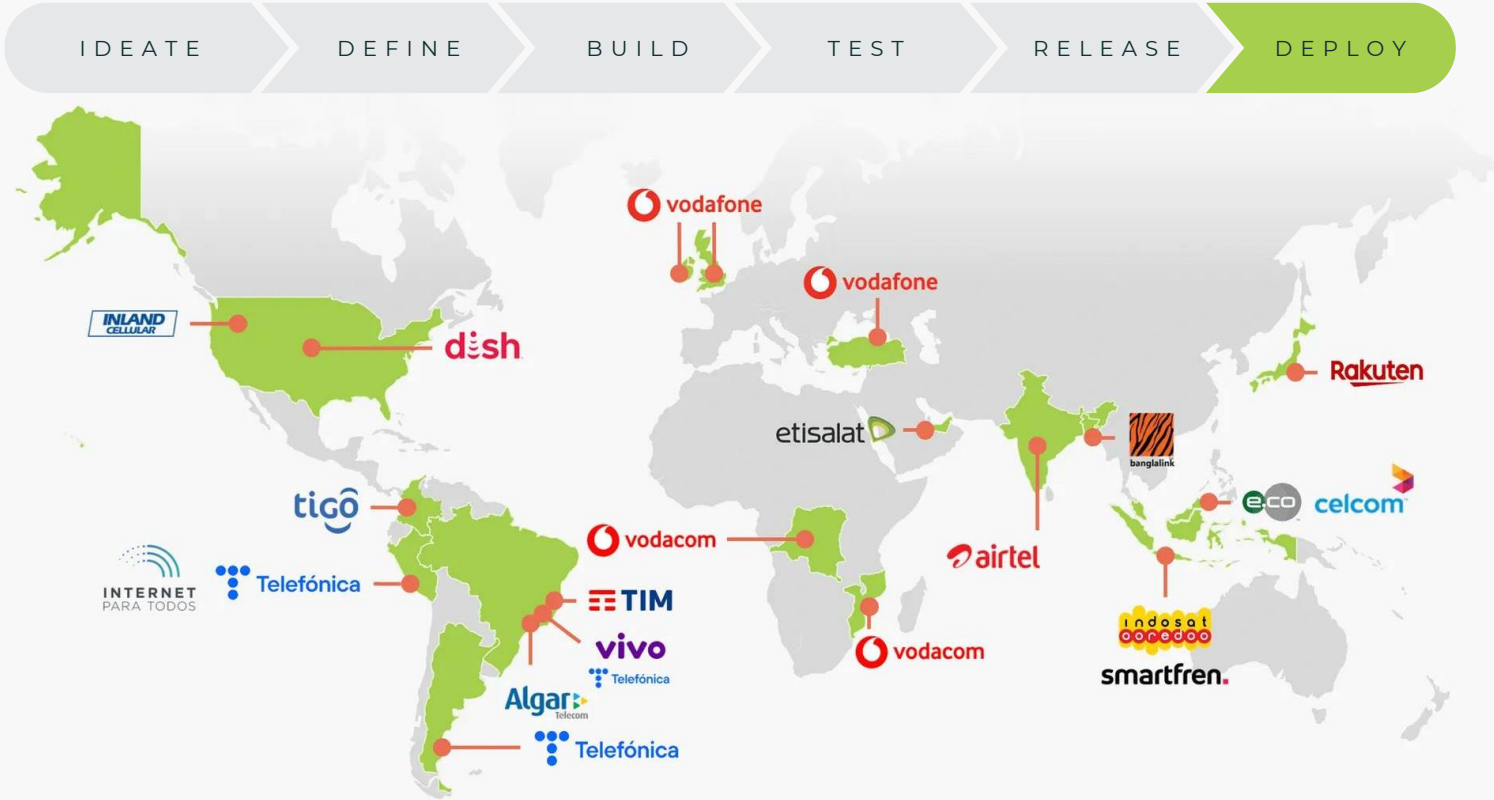
TIP: A Coordinated OpenRAN Roadmap Drives Testing*



*TIP is currently working with published requirements from the European Operator MOU Group.

Open RAN Technical Priority Document, by the Open RAN MoU signatories

Global OpenRAN deployments and trials *



*As published on 24 Jun'21: TIP's OpenRAN Project Group Accelerates the Development, Validation, and Deployment of OpenRAN Solutions

Thank you