



TELECOM INFRA PROJECT

Together we innovate...  
...Together we build...  
...Together we deploy

Nov 2024

# Together We Innovate, Build & Deploy

## Contents

1. TIP value proposition
2. TIP Project Groups
3. Becoming a TIP member

More info: [membership@telecominfraproject.com](mailto:membership@telecominfraproject.com)

Together We Innovate, Build & Deploy

## Our Mission

TIP is a global community of organizations working together to accelerate the deployment of open, disaggregated, and standards-based network solutions, through promoting, developing, and testing products and solutions.

TIP convenes industry and policy stakeholders, providing a neutral platform for innovation and industrialization, allowing its members to achieve their objectives.



Together We Innovate, Build & Deploy

# TIP is Uniquely Positioned to Enable Market Scaling of Open Network Solutions



**CONVENER**  
OF THE TECH  
COMMUNITY

**ENABLER**  
OF INDUSTRIALIZED  
SOLUTIONS

**FACILITATOR**  
OF INNOVATION



**STANDARDS  
BODIES**



**TELECOM  
OPERATORS  
& SERVICE  
PROVIDERS**



**TELCO & NON-  
TELCO  
NETWORK  
SOLUTION  
PROVIDERS**



**TEST LABS &  
SPECIALISTS**



**INFLUENTIAL  
GOVERNMENTS,  
R&D, ACADEMIA**

**GLOBAL  
OUTCOMES**

**Certified  
Deployable  
Solutions**

**More  
Deployments**

**Supply  
Diversification**

**Global Scaling**

**Further  
Innovation**

# Together We Innovate, Build & Deploy TIP Leadership team



Kristian Toivo

Executive Director



Vishal Mathur

Global Head of Engagement



Eugina Jordan

Chief Marketing Officer



Shannon Yalamas

Head of Operations



Olli Andersson

Chief Technology Officer



## TIP's Board of Directors



**ROB SONI**  
TIP Chairman  
Vice President,  
Radio Access Network  
Technology



**CAROLINE CHAN**  
TIP President  
VP & GM,  
5G Infrastructure Division,  
Network Platform



**LARRY ALDER**  
TIP Secretary/Treasurer  
Director,  
Connectivity Systems



**CAYETANO CARBAÑO MARTÍN**  
Board Member  
Senior Vice President,  
Core, Transport & Service Platforms



**THOMAS LIPS**  
Board Member  
Senior Vice President,  
Group Technology  
Deutsche Telekom



**KEVIN HOLLEY**  
Board Member  
Director,  
Technology Standards  
& Ecosystems



**LAURENT LÉBOUCHER**  
Board Member  
Group CTO &  
Senior Vice President



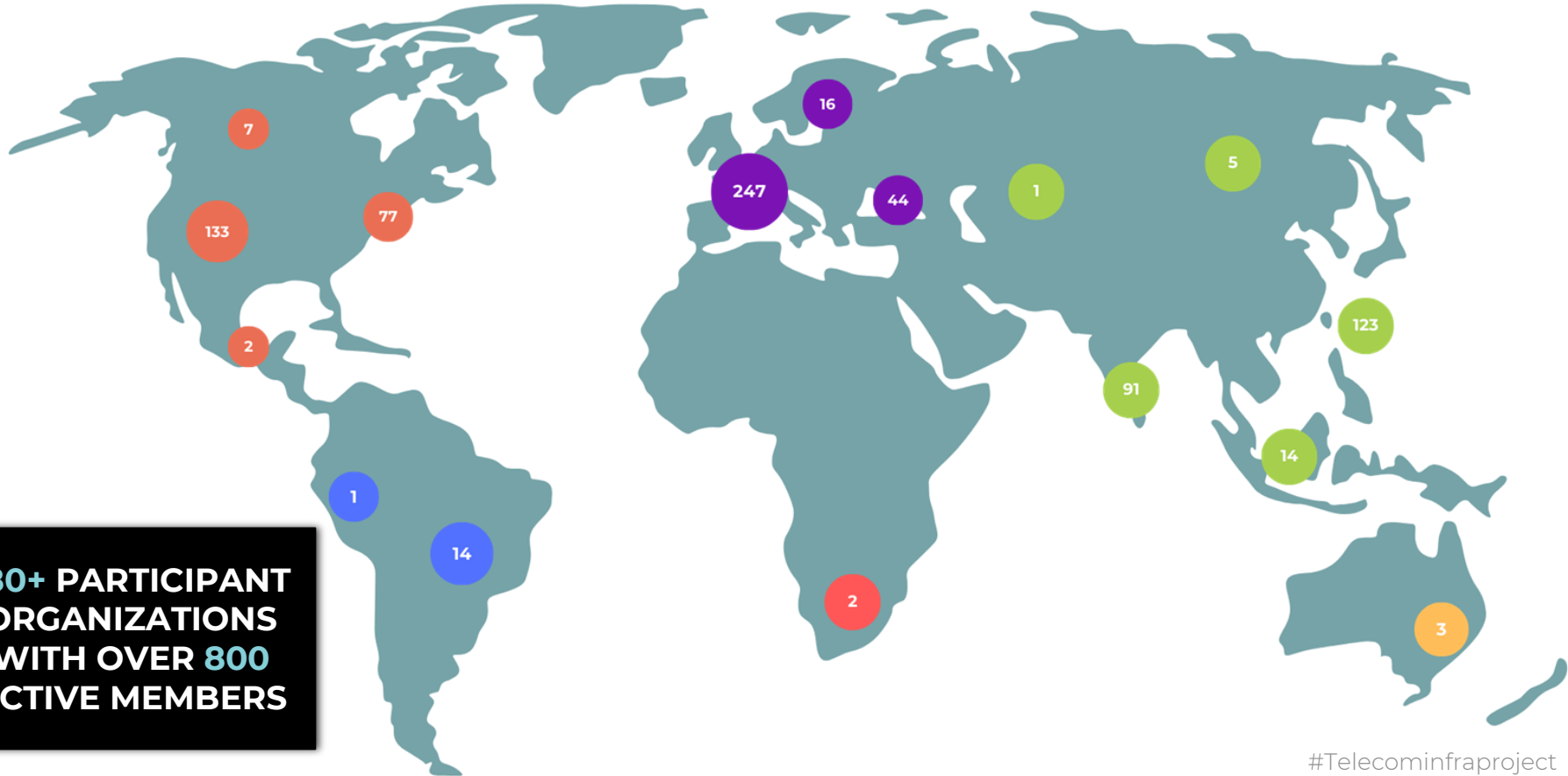
**AMITH MAHARAJ**  
Board Member  
Group CTO,  
Network Design  
& Planning



**FRANCISCO MARTÍN PIGNATELLI**  
Interim Board Member  
Head of Open RAN

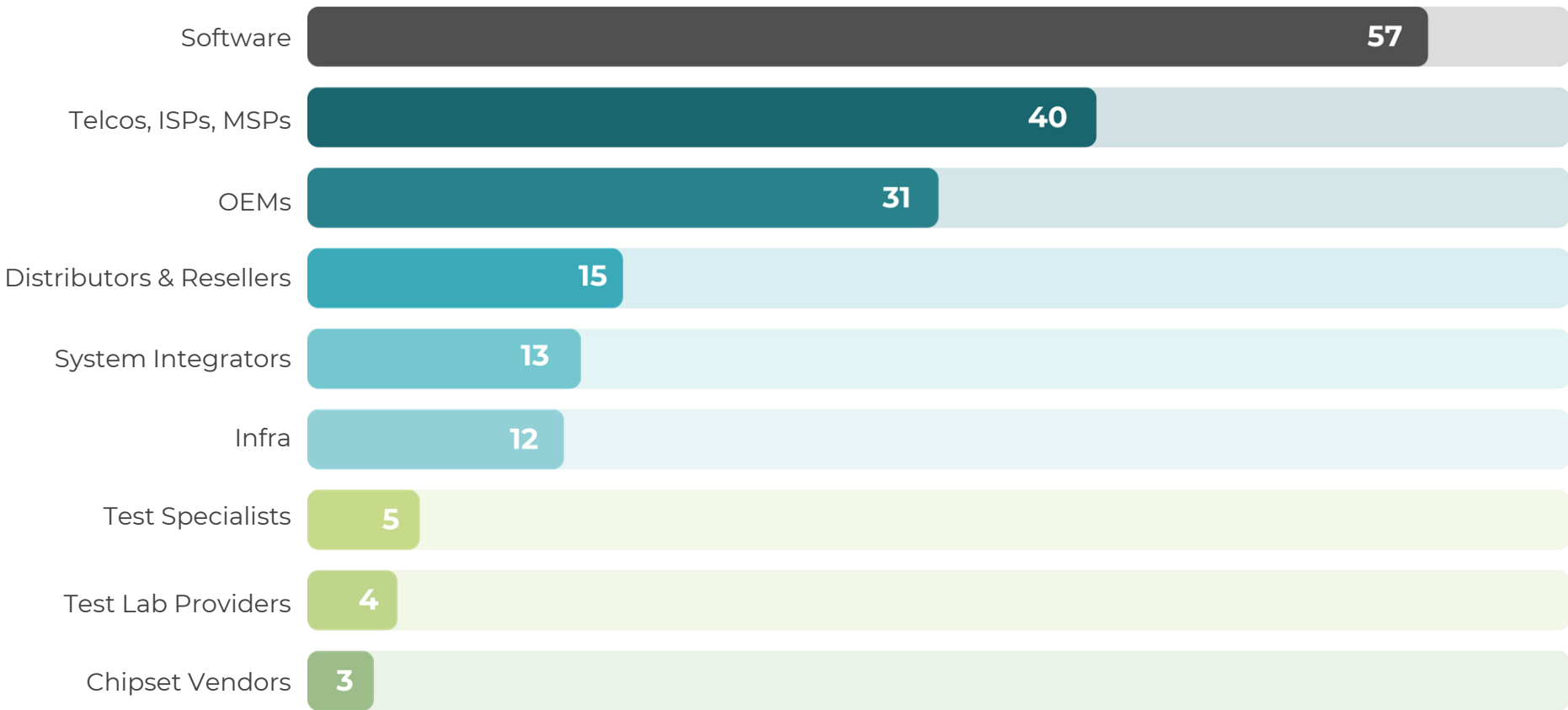
## COMMUNITY BREADTH & DEPTH

# Participating Members by Continent



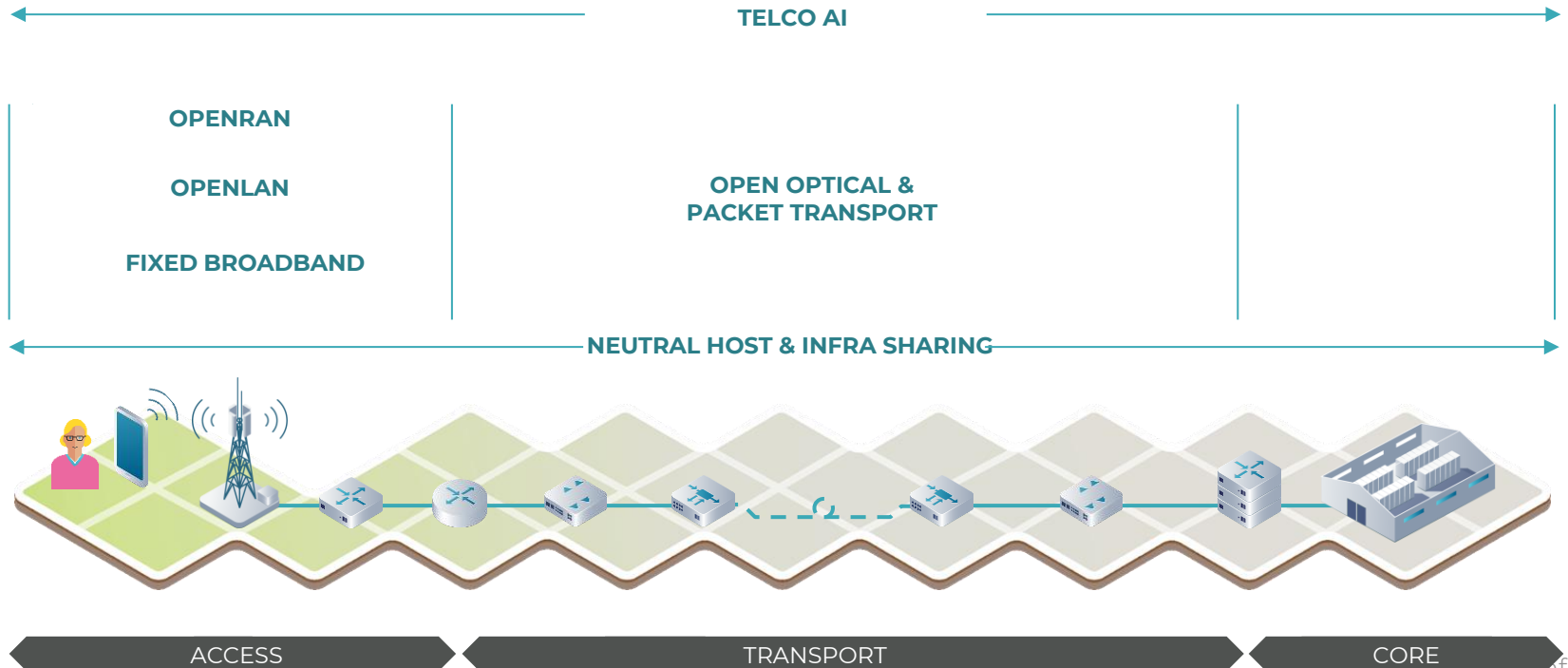
**180+ PARTICIPANT ORGANIZATIONS WITH OVER 800 ACTIVE MEMBERS**

# Participant Organizations by Classification





# Together We Innovate, Build & Deploy TIP Project Groups (PGs)



Together We Innovate, Build & Deploy

# We collectively channel our efforts through the TIP framework



180 participating organisations with 800+ active members

Defined use cases, blueprints & test requirements within PGs



TIP Testing framework certifying deployable solutions



Test & Validation Council



Badge allocation based on test completion against defined criteria



Network of regional TIP Authorised labs

Promotion of certified solutions & suppliers



TIP Exchange for trusted solutions



TIP Certified vendors & integrators



Convene & Promote industry wide

By TELECOM INFRA PROJECT



15 courses + webinars  
5 global partners

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## Resulting in meaningful outcomes

In 2024, we are proud to see:

### Testing & Badging

- First Open RAN System Performance Test Plan
- MANTRA multi-vendor IPoDWDM Proof of Concept
- ~40 TIP Badges awarded over the course of 2024

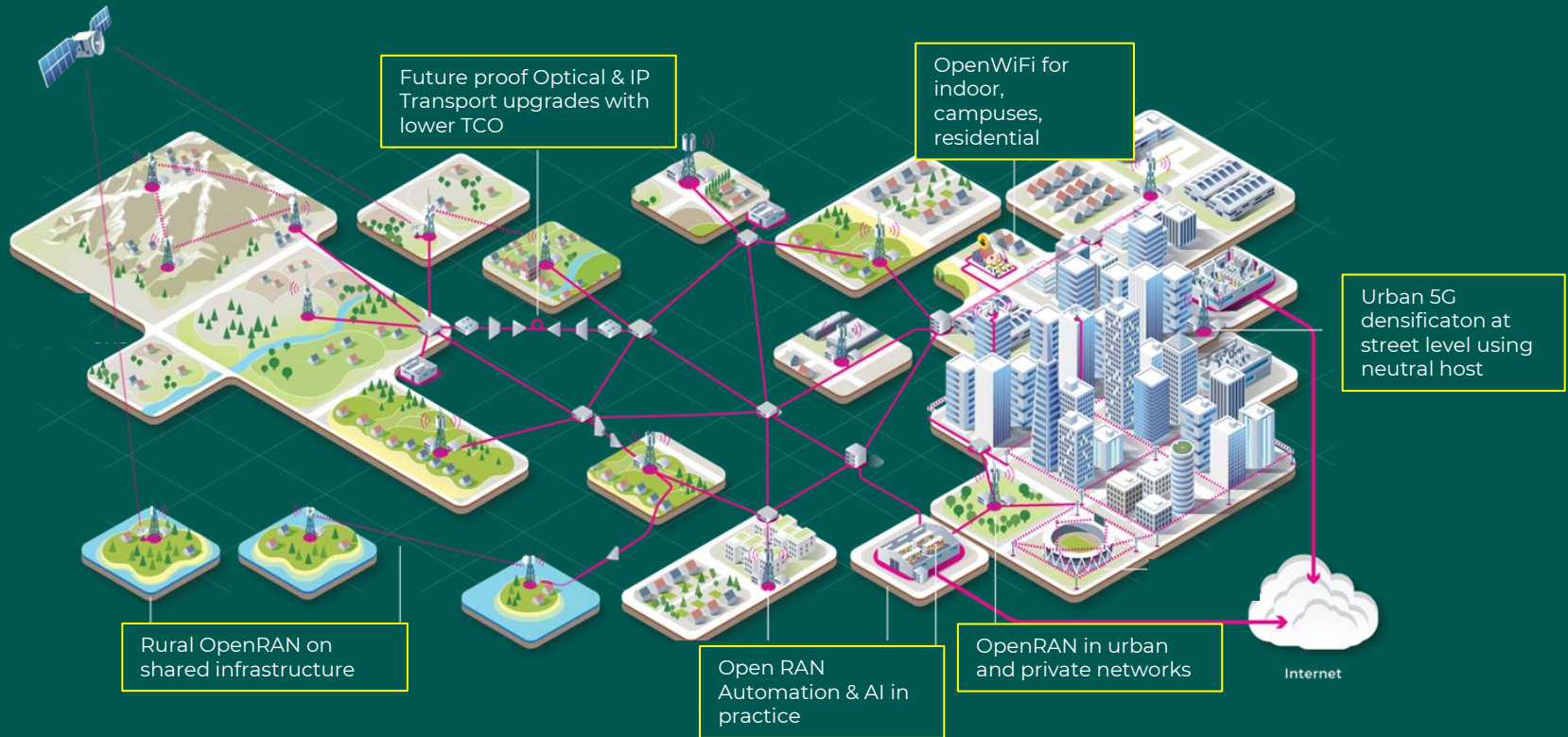
### Trials & Deployments

- 9 out of 17 priority xAPPs/rAPPs tested for live
- Phoenix Open Transponder solution tested in live network
- 100K+ TIP OpenWiFi Access Points deployed globally

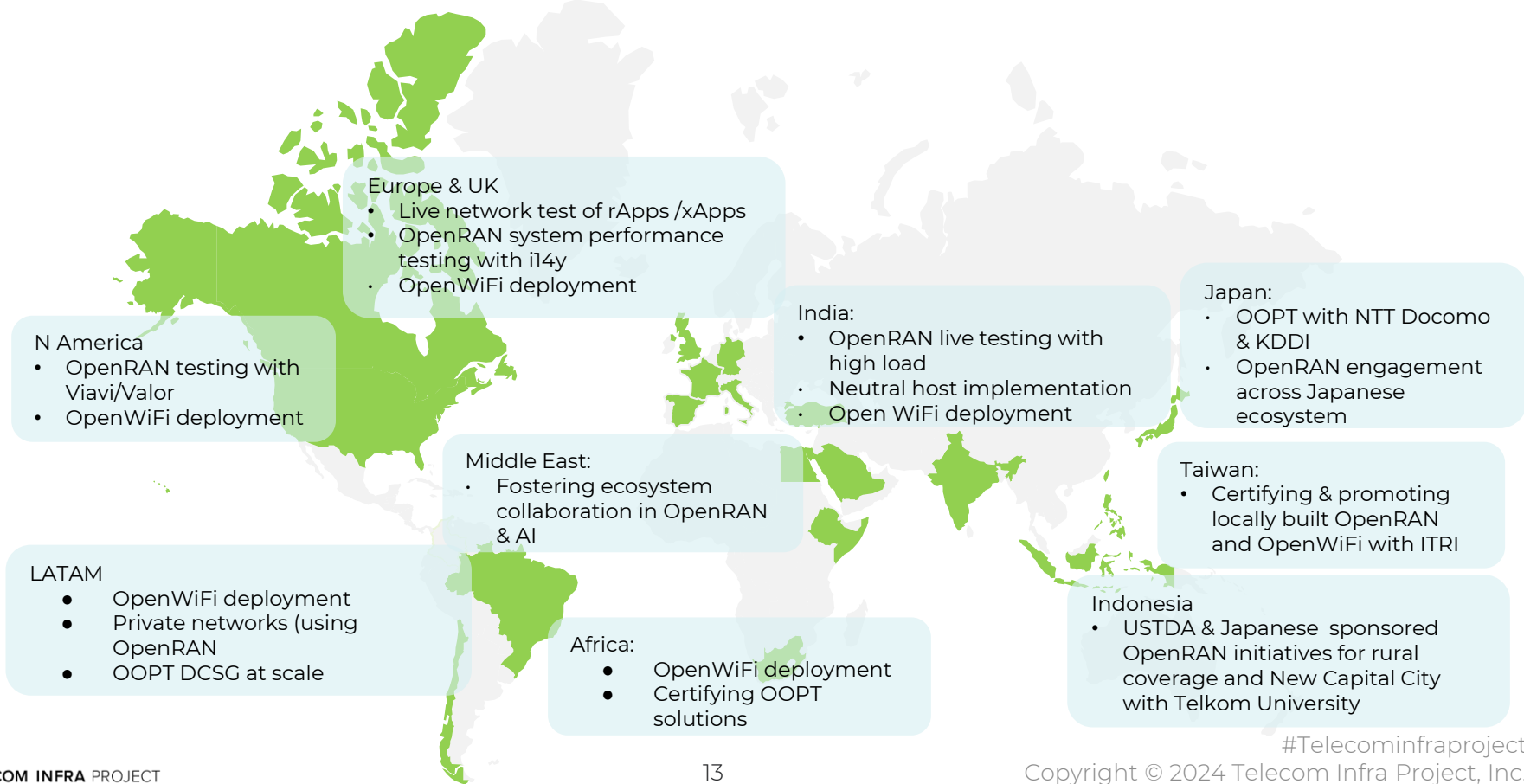
### Breaking new ground

- 2 Playbooks to support neutral host deployment
- Charting new areas of innovation in Telco AI
- 800+ TIP Academy certificates issued to 1500+ learners

# TIP holds blueprinted examples of replicable solutions



# TIP provides opportunity for more impact on a global scale



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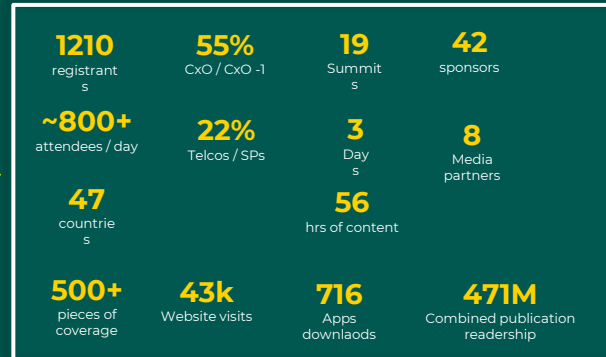
**Fyuz is the annual TIP event where these case studies are promoted and future innovation is discussed**

*TIP Event strategy: Quality not quantity in terms of Attendance, Speakers, Experience, Networking*

## Fyuz 2022



## Fyuz 2023



## Fyuz 2024

- Dublin
- Nov 11<sup>th</sup> – 13<sup>th</sup> 2024
- 220+ speakers; 1000+ registered; 35+ sponsors
- [www.fyuz.events](http://www.fyuz.events)

“

*Right agenda, relevant content, great networking*

”

“

*Excellent quality of attendees and companies represented.*

”

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TIP's member value proposition

# TIP ACADEMY – addressing the skills gap as the industry transforms



in collaboration with **accenture**

TIP estimates that for the **\$14Bn global equipment market** draws a **directly related services market of \$21B** (~ 60% of the total addressable market).

This associated services market requires **more than 170,000 new trained resources** by 2028, with mix of skills incl.



SW and systems integration



Cloud and virtualization technologies



5G & 6G communications

- Industry neutral **B2B & B2C**
- Available now: **Open RAN curriculum, Telco Cloud**
- 15 courses + webinars
  - **250+ learners**
  - **1500+ enrollments**
  - **800+ certificates issued**

[www.tip.academy](http://www.tip.academy)

Global partners to deliver TIP Academy value to communities of telecom professional and students



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# TIP points of focus for OpenRAN (highlighted in bold)

1

**Aggregated telco requirements** for: cloud-native, automated, AI-driven pre-integrated solutions, which manage and optimize performance in (Open) RAN workloads



*116 individuals within the community*

4

Legacy integration & cloud orchestration



Open RAN solutions:

- e2e blueprints and test plans
- rAPPs/xAPPs 3<sup>rd</sup> party dev ecosystem
- Multi-vendor integration

- OSS/BSS integration
- Multi-cloud orchestration
- **CI/CD & lifecycle management**



3

Automation & AI for managing RAN workloads

- SON -> rAPPs migration
- Digital Twin
- Edge based near real time tuning



2

Containerized software, cloud stacks with interoperable hardware

- **Test & Certification of Pre-integrated solutions with cloud infra**



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## TIP OpenRAN blueprints for telcos to adopt



### 4G/5G Greenfield

- Rakuten (Japan), 1&1 (Germany) – Rakuten Symphony
- Dish/Echostar - Mavenir-Dell-Fujitsu-Samsung



### Rural brownfield

- MORAN or Shared Infra*
- IPT (Peru) – Parallel Wireless
  - Indonesia – Parallel Wireless / Mitratel / Edotco / Kacific
  - Vodafone & Orange Romania - Samsung



### Urban

- Vodafone UK, Telefonica Germany, Telus - Samsung-Dell-Windriver –
- Airtel India, Virgin O2, Saudi Telecom - Mavenir
- NTT Docomo – OREX SAI



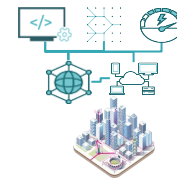
### Indoor

- Indonesia – OREX SAI
- China Unicom



### Private network

- Multiple example end to end solutions involving Verizon Wireless / Nokia / Intel / Dell / Accelleran / Mavenir / Cyient / Accenture / CapGemini
















### Automation & AI (RICs + rAPPs/xAPPs)

- 9 out of 17 prioritized rAPPs / xAPPs tested against multiple RICs under telco network simulated conditions

Challenges to tackle: performance & feature parity, lifecycle management, long term TCO

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## Progress on telco priority xAPPs/rAPPs

 <p>UC1 (X1): Multi-User MIMO Pairing</p>	 <p>UC2 (X2): Uplink Channel Estimation</p>	 <p>UC3 (X3): Inter-frequency &amp; Inter-RAT handover</p>	 <p>UC4 (X4): Inter-Cell Interference Co-ordination <b>VIAMI</b></p>
 <p>UC5 (X5): Accurate Real Time User Location Data based Handovers</p>	 <p>UC6 (R1): SSB Beamset Optimization <b>amdocs</b></p>	<p>UC7 (R2): Traffic Steering &amp; Predictive Load Balancing <b>HCLTech</b> <b>REPLY NET</b></p>	 <p>UC8 (R3): Coverage &amp; Capacity Optimisation <b>amdocs</b></p>
<p>UC9 (R4): Power Saving by Load-Adaptive Mode <b>amdocs</b> <b>Acelleran</b></p>	 <p>UC10 (R5): Atmospheric Ducting Interference Mitigation</p>	 <p>UC11 (R6): PCI Configuration &amp; Optimisation <b>airProAI</b></p>	 <p>UC12 (R8): Systemwide multi-carrier capacity optimisation</p>
 <p>UC14 (R9): QoE Optimisation</p>	 <p>UC15 (R10): NSSI Resource Allocation Optimisation</p>	<p>UC16: QoS Based Resource Optimisation <b>REPLY NET</b></p>	 <p>UC17: RAN Slice SLA Assurance</p>
<p>Performance benchmarking of E2 interface across RICs <b>HCLTech</b></p>		<p>Quantum safe security across OpenRAN interfaces <b>ARCIT</b></p>	

Together We Build, Test & Deploy

## TIP's OpenRAN System Performance Test Plan:

*The Test Plan encompasses 115 test cases, primarily focused on non-functional testing areas such as performance, scalability, resiliency, operational aspects, energy efficiency, and technical feature validation*

### INDUSTRY NEED

Operators recognize the need for a unified certification framework to ensure Open RAN scalability and parity with traditional RAN, benefiting operators of all sizes.

### CHALLENGE

The industry faces a challenge in enhancing the maturity and deployability of Open RAN. The absence of a widely accepted System Certification Framework for multi-vendor Open RAN solutions has led to a heightened testing burden for Operators, System Integrators and vendors.

### COLLABORATION

AT&T, Vodafone, and Deutsche Telekom (DT) collaborated under TIP to establish an industry-led initiative for a System Certification Framework for Open RAN, aimed at accelerating deployment and adoption.

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# TIP points of focus for OOPT (highlighted in bold)

1

**Aggregated telco requirements** for: use case centric software defined Open Optical & IP Packet transport solutions with AI automation



*101 individuals within the community*

4

Metaverse & AI ready architectures for Transport networks

- AI & Data architectures for Transport
- **IP over DWDM & Metaverse ready use cases for Optical & IP Transport**

3

Target Management Control architecture

- **Specification and test of Northbound & Southbound API & OpenConfig integrations**
- **Promo of GA solutions**

2

Containerised Interoperable software defined Optical & IP disaggregated solutions

- **Feature evolution of hardware & software**
- **Test & Certification of SDN Controlled Open Optical & IP devices**
- **Promo of GA solutions**



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# TIP points of focus for OpenLAN (highlighted in bold)

1

**Aggregated ISP/MSP feature and go to market requirements** for: cloud controlled OpenWiFi and OpenLAN PoE switching



*195 individuals within the community*

4

Commercial Use cases & Solutions using OpenLAN stack

- **Supportive go to market for OpenLAN stack solutions**

3

Interoperable OpenLAN Cloud Controller SDK

- **Feature roadmap, test & certification of interoperable Cloud Controller SDKs for OpenWiFi APs and OpenLAN PoE**

2

OpenWiFi & OpenLAN PoE whitebox with Open Source Firmware

- **Maintained open-source code base**
- **Feature roadmap, test & certification of interoperable hardware SKUs**



PEGATRON



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# TIP points of focus for Telco AI PG (highlighted in bold)

1

**Common Telco AI use cases and expression of business & technical requirements**



*116 individuals within the community*

4

PoC trials for blueprint & scaling

- **Test definition, certification and promotion of operator driven trials**

3

Telco Network Data Access & Management for AI/ML use cases

- **Data access and management policies (aligned with other industry bodies)**

2

AI end to end architectures to match with use case requirements

- **Supplier ecosystem development**
- **Published end-to-end AI reference architecture for priority use cases**



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# TIP points of focus for Neutral Host Infra Sharing (highlighted in bold)

1

**Telco, Towerco, Infra Provider: expression of common definitions, qualification criteria for NHIS implementations and showcase of end-to-end business models**



4

Definition of neutral host infra sharing models

- **Qualification criteria (useful for badging)**
- **Benchmarking tool**

3

Outdoor / Edge opportunity development

- **Leverage collaboration with City Telecom Association to identify urban opportunities**
- **Solicit community projects**

2

In-building neutral host models & opportunity development

- **US In-building market analysis**
- **Solicit community projects**

*61 individuals within the community*



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# TIP points of focus for Fixed Broadband (highlighted in bold)

1

**Aggregated telco requirements** for: use case centric open and disaggregated Fixed Broadband solutions



*35 individuals within the community*

3

Broadband Network Gateway Architectures

- **Feature evolution of hardware & software**
- **Focus on convergence with different Fixed Access technologies**



ufiSpace



Adtran

2

Fixed Access “Last Mile” Whitebox Devices

- **Focus on 1G/10G capable technologies and associated transition architectures for specification and test**
- **Promo of GA solutions**

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# PARTICIPANT CLASSIFICATIONS

## Fees and general benefits

Access to all Project Groups

Band	A	B	C	D	E	F
Annual Gross Revenue (USD)	> \$500M	\$50M to \$499.9M	\$25M to \$49.9M	\$10M to \$24.9M	\$1M to \$9.9M	< \$1M
Base Annual Dues (USD)	\$50,000	\$40,000	\$25,000	\$15,000	\$10,000	\$5,000

Access to all Project Groups

Access to OpenLAN Only

Research & Testing		Open Source Focus	
Labs & Testing Specialists	Academia & Government Agencies	Implementers	Contributors
\$30,000	\$2,000	\$5,000	\$10,000

[Click here to learn more.](#)

### Principles

1. Revenue tiered structure to be fair and equitable for large & small companies. Exception tiering for Test Houses, Academia and Open Source Community
2. Pay annual fee in January 2025 (pay once or on payment plan)

### General Benefits

1. Full Access to ALL Project Groups and Test Events happening globally
2. Opportunity to get TIP Certified and Promoted into Global Industry
3. Opportunity for leadership position in Project Groups (open to all members not just telcos)
4. Platform for global suppliers and customers to connect
5. Brand amplification based on membership and activity
6. Discounts for TIP Academy training



# ORGANIZATIONAL DOCUMENTS

## TIP Documentation for your review



[Bylaws](#)

[Antitrust Guidelines](#)

[Intellectual Property Rights Policy \(IPR\)](#)

[General Participation Agreement \(GPA\)](#)

[Sponsor Participation Agreement \(SPA\)](#)

CLICK HERE FOR THE  
FULL LIST OF TIP'S  
ORGANIZATIONAL  
DOCUMENTS

# HOW TO JOIN

## Process for joining



**START YOUR APPLICATION**

More info: [membership@telecominfraproject.com](mailto:membership@telecominfraproject.com)



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