

TIP's Open RAN System Certification process (SCOPE): Aligning the Industry and Accelerating Open RAN Commercial Deployments



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Executive Summary

There are clear, well-documented benefits to developing a network made up of disaggregated, open solutions that include innovation, increased choice of suppliers and also lower TCO. However, integration and testing have become significant tasks for operators. Many call for more help integrating Open RAN systems and accessing tested market-ready solutions that meet their requirements.

TIP's planned Certification process, called SCOPE, is the solution. It is designed to create significant structural efficiencies within the supply chain to streamline efforts across operators and their vendors and reduce the complexities inherent in the integration and testing of carrier-grade Open RAN. Through formal Certification of Open RAN interoperability at the system level, SCOPE will:

- Reduce Open RAN market fragmentation
- Create supply chain efficiencies
- Drive greater industry coordination
- Build marketplace confidence

The Challenge: Structural Supply Chain Inefficiencies

Open RAN solutions are designed to give operators optionality in their choice of suppliers across the value chain. By disaggregating the different functions of the network, operators can deploy networks made up of solutions from different vendors within the technology stack. This gives them several benefits. Specifically, they can:

- Access solutions that they feel are best-of-breed or best suit their purpose without having to buy all parts of the solution from the same vendor, and
- Update and upgrade software and hardware independently instead of being dependent on the upgrade roadmap of just one integrated vendor.

Vendor choice also means operators are not dependent on the supply chain and pricing of just a few vendors. This avoids a potential strategic weakness that has also been identified by, and is of concern to, many global governments.



While the benefits of developing a network made up of disaggregated, open solutions are clear, challenges remain. In particular, the integration and testing process has become difficult for operators, many of whom are calling for more help in integrating and testing Open RAN systems and accessing market-ready solutions that meet their requirements.

This is not surprising, as Open RAN testing and procurement do not easily fit into the model operators have relied upon for many years. In the traditional fulfillment model, major Original Equipment Manufacturers (OEMs) were responsible for pre-integrating the full RAN system – pulling together a complex set of subsystems built by multiple internal hardware and software teams and testing the full system on a continuous basis for each major release and interim minor releases. This OEM-specific process was generally performed centrally by a major vendor for a global market of hundreds of operators.

Because Open RAN removes these historic efficiencies by disaggregating the RAN system into different sub-systems, operators now need to take on the additional role of serving as the system integrator, verifying all the elements of the system and all the interfaces between them.

Additionally, each operator must go through the integration and testing process for each vendor it engages with, and every vendor must go through the same, often duplicative, process with every operator. This does not scale. It is massively inefficient, time-consuming, and expensive for both operators and vendors.

Operators want Open RAN solutions that have been validated to meet their operational requirements and can be integrated with other elements within their network architecture without having to retest the whole system.



The Solution: TIP's Open RAN System Certification Process (SCOPE)

TIP has done critical foundational work to help build purchaser confidence and address supply chain efficiency issues vis-a-vis its (1) Open RAN Project Group and its sub-groups, (2) its badging of products and solutions, and (3) its marketplace processes, called "TIP Exchange."

TIP's Open RAN Project Group and sub-groups – in cooperation with leading operators, vendors, systems integrators, and other stakeholders throughout the world – seek to harmonize requirements for Open RAN solutions that comprise radio units ("RUs"), distributed units ("DUs"), and centralized units ("CUs"), as well as the RAN Intelligent Controller ("RIC") platforms and applications, and many other components of Open RAN solutions. Like other TIP project groups, the Open RAN Project Group emphasizes creating joint roadmaps that are built on market demand, then building and testing products at scale.¹

TIP's process encompasses technical roadmaps, solution blueprints that correspond to deployment scenarios as well as testing activities, and a range of resulting deliverables that document the results of the process.

This flow consists of three major stages: (1) **creation of technical roadmaps**, where operator requirements, commercial priorities, and use cases are identified and translated to definitions with a feedback loop with participating vendors, ensuring that all inputs from the industry are accounted for; (2) **testing and validation** based on blueprints and test plans that ensure that components integrated as a solution can operate as a complete Open RAN system and be deployed in a live network; and (3) **publishing the blueprints, the test plans as well as the badged products and**

¹ TIP released OpenRAN roadmap release 2.1 based on operator requirements and vendor readiness. All subgroups have received great responses from vendors with compliance for OpenRAN Release 2.1 features. <https://telecominfraproject.com/openran/>

solutions on the TIP marketplace, TIP Exchange. TIP Exchange enables participating operators to identify suitable solutions and vendors to promote their products and services based on documented results from participating in the process.²

With SCOPE, TIP is now scaling and strengthening this foundational process and adding the “missing ingredient,” which it views as a critical step needed to market confidence for disaggregated RAN systems - System Certification.

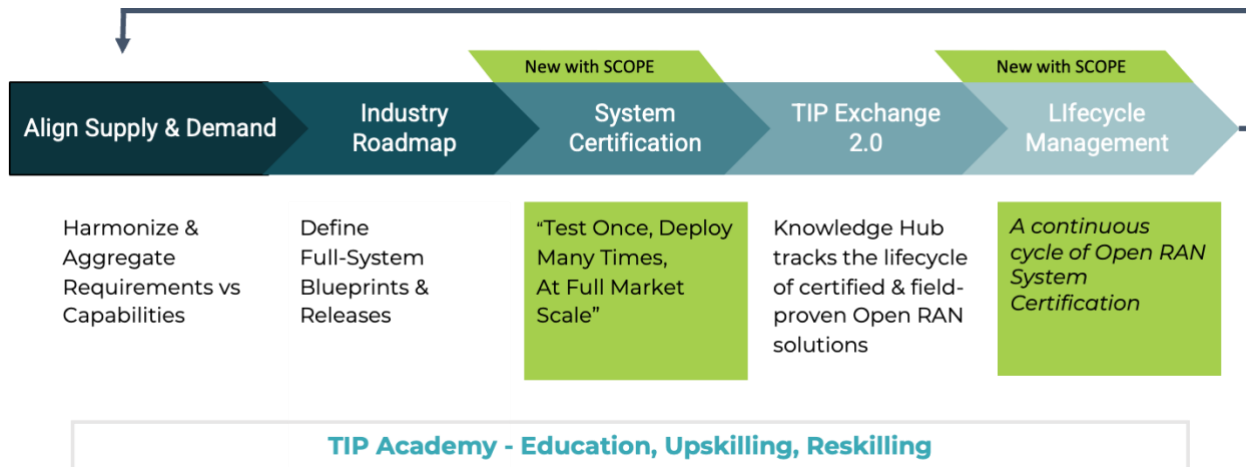


Figure 1: TIP's System Certification Framework

System Certification will require testing that will build on O-RAN ALLIANCE OTIC testing but go far beyond product conformance and interface operability testing, assuring buyers and raising confidence in the full, truly multi-vendor Open RAN solutions. Uniquely and crucially, the focus will include:

- Certification of vital, operator-prioritized sub-systems and full Open RAN solutions with specific product combinations and configurations;
- Certification through the upper-TRL* phases of system integration towards “First Office Application” and beyond into lifecycle management;

² TIP has added 141 new OpenRAN product listings on TIP Exchange from 53 technology suppliers. This includes products from Dell, Fujitsu, NEC, STL, Supermicro, and many more technology providers. <https://telecominfraproject.com/tip-openran-pg-accelerates-open-ran-commercialization/>

- Non-functional requirements including performance, security, operability, stability, etc.;
- “Negative” testing to ensure the solutions perform consistently in unexpected circumstances.

*TRL = Technology Readiness Levels

SCOPE Process

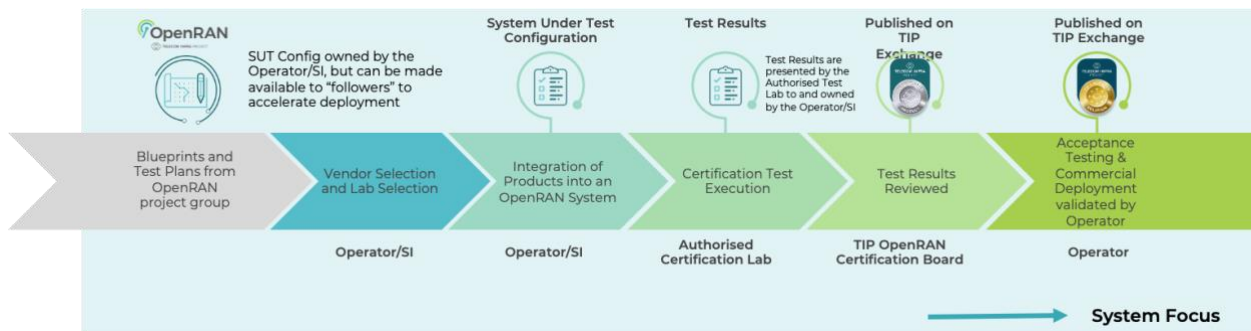


Figure 2: TIP's Open RAN System Certification Process

The SCOPE process gets its initial technical documentation from the TIP OpenRAN Project Group, which makes system Blueprints and Test Plans needed for the process. The participating operators have approved these deliverables to represent the targeted deployment scenarios.

Actual Open RAN configurations chosen by operators will be integrated and tested as a system in a TIP-accredited System Certification Laboratory.

The different roles of the main actors involved in the TIP System Certification process are described in the following figure:

	Pre-Certification	Pre-Launch	Post-Launch
OTIC	Product Conformance and Interoperability Testing		
System Integrator*	Full RAN System assembled and pre-tested by Prime Integrator/Contractor prior to submission for System Certification	<ul style="list-style-type: none"> Responsible for achieving System Certification 	<ul style="list-style-type: none"> Full RAN System Lifecycle Management Responsible for keeping system certified
TIP-accredited Certification Lab		<ul style="list-style-type: none"> Used for Full-RAN System Certification Testing 	<ul style="list-style-type: none"> Used for Re-Certification at major releases and post-launch upgrades
TIP	TIP facilitates pre-Certification engagement as part of TIP's Open RAN end-to-end process	<ul style="list-style-type: none"> Oversees Lab Accreditation Audits Test Results & Grants Certification 	<ul style="list-style-type: none"> Maintain Lab Accreditation Audits Test Results & Grants Certification Track Deployment Progress Publishes & markets certified systems at TIP Exchange

Figure 3: Roles involved in TIP system certification

*System Integrator: Can be Traditional SI, a Vendor acting as SI, or the Operator acting as SI

The TIP Certification Board, representing participating operators, will govern the certification process, confirm lab accreditations, as well as define the criteria for, and govern the TIP Badging.

After the certification, the operator deploys and accepts the system, and post-deployment life cycle management of the systems begins.



SCOPE Creates Value for the Whole Ecosystem

The SCOPE process brings clear, measurable value for all industry stakeholders.

For **Operators**, this means:

- Confidence to purchase systems from an increasingly competitive field of system integrators & OEMs;
- Time and cost savings from not having to play a primary role in integrating components;
- Greatly reduced need for RFIs and PoCs;
- Competitive RAN Infrastructure pricing;
- Unified process ensuring requirements are shared with a competitive field of vendors; and
- Better access to innovative products.

System Integrators and Certification Labs will benefit from:

- Certified process for offering Open RAN services to operators;
- Access to Global Operator Open RAN Requirements;
- Access to innovative products needing a system stack; and
- For labs, a steady flow of Open RAN configurations requiring Certification.

Incumbent and rising OEMs will benefit from a faster path to market of their solutions with

- Certified process for selling & delivering Open RAN equipment to operators,
- Certified process for ensuring system functionality for multi-vendor deployments, and
- Process easing the operator acceptance process.

Product Vendors & Start-ups will have:

- Clearer product development by opening up access to globally aggregated and

- harmonized operator Open RAN requirements;
- Greater access to fully integrated system stacks that operators are ready to deploy;
 - Greater visibility by operators of innovative vendor and start-up products through TIP Exchange; and
 - Access to a fully functional lab environment.

The global coordination by TIP ensures cost-effectiveness and total market impact. TIP prioritizes Open RAN configurations corresponding to deployment scenarios aligned between a large cross-section of global operators, thus saving duplication cost and time for the vendors, system integrators, and operators involved

SCOPE Will Accelerate The Market

In 2020, TIP carried out a successful pilot of a System Release Certification process for Open RAN, proving that new releases of Open RAN would be tested 60% faster with a centrally coordinated Certification process. The learnings from this successful pilot have led to the development of the SCOPE T&E framework.

System Validation Pilot successfully concluded in Europe

Scope	Duration	Result	Conclusion
3 RAN vendors	16 weeks	56 issues found & fixed in timely manner	60% faster to test a release centrally with SRV, vs per operator
45 test cases	4 weeks actual test execution	Details are under NDA between Pilot participants	Creates confidence in functional, performance and operational capability of a specific combination of OpenRAN products, combined into a full, deployable RAN system

Market Impact Forecast:



Figure 4: System validation pilot in Europe



Operator Confidence Is the Key to Success

Of course, such a process will stand or fall on the operator's willingness to accept and trust the SCOPE process. The process aims to produce solutions that are, as near as can be, deployment ready. There is little point in operators taking these solutions and then submitting them to a duplicative test and Certification process. They must be able to trust the systems TIP has in place and only concern themselves with tailoring to local environments and fine-tuning performance optimization. TIP has the tools, expertise, experience, and global membership base to deliver on this mission to achieve the vitally important level of market efficiency needed to stimulate the widespread adoption of Open RAN.

Complementary Roles of TIP and O-RAN Alliance

There are often questions about the respective roles of TIP and the O-RAN Alliance, so it warrants some clarification. The O-RAN Alliance defines technical specifications and, through testing in its OTIC labs, ensures that products conform to these, based on which it issues badges to participating products. Meanwhile, TIP's focus is to develop and certify solutions that meet the requirements for specific commercial use cases that operators need. For example, it might define blueprints corresponding to rural, semi-rural, or urban deployments, considering the typical power profiles, number of antennas, bandwidth and frequency requirements, and types of Open RAN Radio Units.

TIP and O-RAN Alliance

Complementary Roles to drive Open RAN readiness and adoption

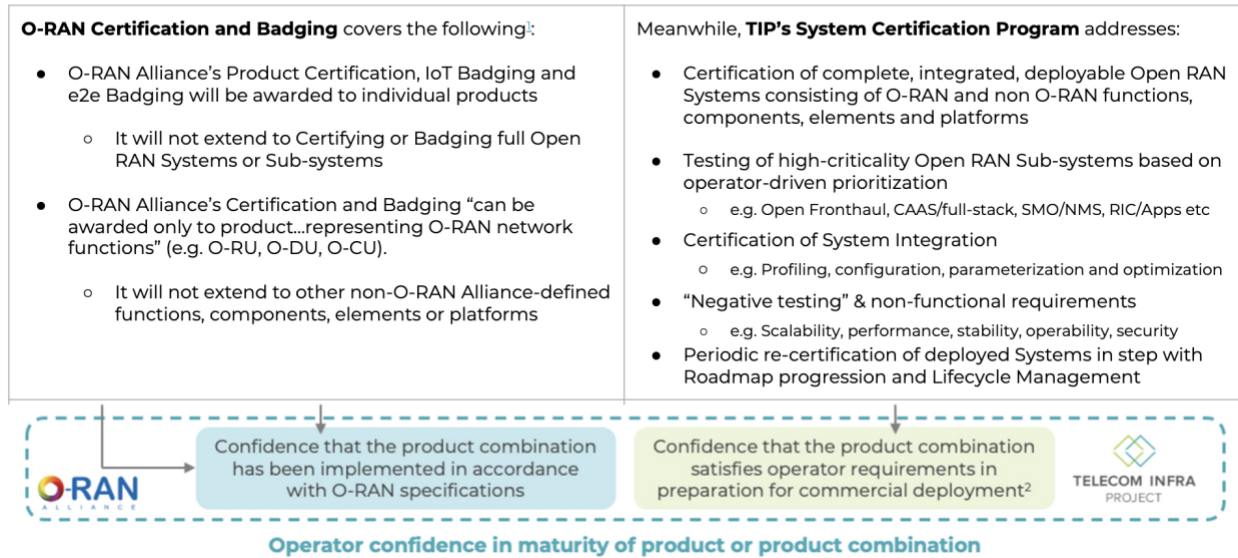


Figure 5: Roles of TIP and O-RAN Alliance

As described in the above figure, TIP's solution and corresponding products are also badged and certified by TIP, depending on the level of market maturity. Members of both TIP and O-RAN ALLIANCE should commit to both processes. TIP badging and certification will provide operators with confidence that a system complies with O-RAN specifications and has the maturity to meet TIP's operator-defined use case requirements.

This will act in concert with a process of continuous alignment and development of the capability and performance of Open RAN. Based on evolving specifications through O-RAN ALLIANCE, the operator-driven use cases and deployment scenarios crafted by TIP working groups into TIP Blueprints will promote Certification and deployment of commercial solutions. Feedback from the Certification and deployment of these solutions enhance and prioritize the continued specification work and conformance testing carried out by O-RAN ALLIANCE.



Conclusion

The global coordination by TIP ensures cost-effectiveness and total market impact. TIP prioritizes Open RAN configurations corresponding to deployment scenarios aligned between a large cross-section of global operators, thus saving duplication cost and time for the vendors, system integrators, and operators involved.

SCOPE will increase operators' confidence in deploying Open RAN technology into live networks today. Operators want carrier-grade solutions and lower integration and testing overhead. For vendors and operators – SCOPE, alongside the TIP community-driven Project Groups and TIP Exchange, presents a way to meet both these challenges and increase the availability of Open RAN solutions.

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