O-RAN Alliance Trends and Testing & Integration Process

July 22, 2022

VIAVI Solutions

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VIAVI's Efforts for the O-RAN Alliance

XRAN ➡ **O-RAN** ALLIANCE

Technical Steering Committee (TSC)	
O-RAN Working Groups	**Focus Groups**
WG1 – Use Cases and Overall Architecture	Test and Integration Focus Group (TIFG)
WG2 – The Non-real-time RAN Intelligent Controller and A1 Interface	
WG3 – The Near-real-time RIC and E2 Interface Workgroup	
WG4 – The Open Fronthaul Interfaces	
WG5 – The Open F1/W1/E1/X2/Xn Interface	
WG6 – The Cloudification and Orchestration	Standards Development Focus Group (SDFG)
WG7 – The White-box Hardware	
WG8 – Stack Reference Design	
WG9 – Open X-haul Transport	
WG10- OA&M	
WG11- Security	
Open Source Community (OSC)	

Technology partnership and test solution provider

1. First T&M vendor that participated in 2018 in the xRAN Forum adopted as part of the WG4 requirements of the O-RAN Alliance

2. Leadership: A co-chair of the Test and Integration Focus Group (TIFG) and WG9, and a member of the Technical Oversight Committee and the Technical Steering Committee (TSC) that oversee the entire Open Source Community (OSC)

   - Only T&M vendor having multiple leadership positions in WG/FG

3. O-RAN specification editor: WG1 (Use Case) Network Energy Saving Technical Report, WG4 (Open Front Haul), the WG5 (X2/F1) interoperability test specification, and the TIFG E2E test specification

4. Participated in O-RAN Global PlugFest (2019 to 2022), and virtual demonstrations

5. Providing a complete suite of solutions: O-RAN laboratory testing, field installation, testing, optimization, and assurance

Test and Integration Focus Group (TIFG)

* VIAVI: Co-chair, Spec editor of E2E Test Specification

End-to-End Test (Spec)

Version 4.0 – targeted for Jul'22 approval train
- CRs related to Report Template and Security
- New tests cases to NSA

Certification and Badging (Spec)

Version 5.0 – targeted for Jul'22 approval train
- Adjustments to allow sharing/recognition of test results/reports from 3rd party labs
- Modification of the test report to cover different level of test outputs
- Decoupling of certification/badging processes and procedures from WG/FG test specs.

OTIC Guidelines (Process)

Version 4.0 – planned for Jun'22
- Alignment with new O-RAN template format
- Updates based on legal review
- Clarification and simplification of OTIC application form based on received feedbacks

PlugFest Guidelines (Process)

NEW

Version 1.0 - planned for H1 2022
- Rules of Engagement already exists, guiding previous PlugFest activities
- Formally documenting PlugFest processes for clarity and consistency

Progress of Specifications Regarding Certificates and Badges (June 2022)

WG/FG	Conformance test	Interoperability test	End-to-end test
WG1: Entire architecture & use cases	N.A.	N.A.	TBD
WG2: Non-RT RIC and A1	A1 Conf. v2.0	A1 IOT planned	N.A.
WG3: Near-RT RIC and E2	E2 Conf. v1.0	E2 IOT planned	N.A.
WG4: Open fronthaul	OFH Conf. v5.0 🏅	OFH IOT v7.0 🎖️	N.A.
WG5: Open F1/W1/E1/X2/Xn	N.A.	X2/F1/Xn IOT v4.0 🎖️	N.A.
WG6: Cloud & Orchestration	O-Cloud under discussion	N.A.	N.A.
WG7: White box HW	Hardware Test planned	N.A.	N.A.
WG8: Stack reference design	N.A.	CU/DU Stack IOT v4.0	N.A.
WG9: Open X-haul transport	Xhaul Test v1.01	N.A.	N.A.
WG10 - OAM	O1 Conf under discussion	TBD	TBD
WG11: Security	Security Test v2.0	TBD	Included
Test and Integration Focus Group (TIFG)	N.A.	N.A.	E2E Test v3.0 🎖️

🏅 **Certificate** is available for the test spec.

🎖️ **Badge** is available for the test spec.

Open Test and Integration Centers (OTIC)

Open Testing and Integration Centre (OTIC) provides a working laboratory environment that is:
- Vendor Independent
- Open and collaborative
- Secure

Open Testing & Integration Center (OTIC)			
Testing	**Certificate**	**Badging**	**Others**
• Lab / Field • Conformance • Subsystem • Interoperability • E2E System	• Conformance	• Interoperability testing • E2E System testing	• Plugfest • Showcases, PoCs, Demos

Benefits of OTIC

- Support wide adoption of O-RAN specifications and promote the openness of O-RAN ecosystem via demos, community events (e.g. speaker sessions, workshops, tutorials), lab and field trials, etc.

- Demonstrate implementations and solutions based on O-RAN specifications via plugfests and proofs of concept (PoC).

- Test and verify the conformity of RAN equipment to O-RAN interface specifications, based on O-RAN conformance test specifications.

- Test and verify the interoperability of RAN equipment from different vendors (or the same vendor) using O-RAN interface specifications, based on O-RAN interoperability test specifications.

- Foster and develop the technical capabilities of integrators via workshops, tutorials, etc.

- Conduct functional and performance (load, capacity) tests of end-to-end systems or sub-systems.

- Provide feedback to O-RAN community about the experiences with O-RAN specifications acquired during the testing, enabling implementation-driven specification.

OTIC Application Status (as of June 2022)

★ Seven OTICs were formally approved.

- European OTIC in Berlin
- European OTIC in Torino
- European OTIC in Paris
- European OTIC in Madrid
- Auray OTIC and Security lab
    - Formally received O-RAN certification (Hon Hai Precision Industry (Foxconn), June 2022)
- Asia & Pacific OTIC in PRC
    - Formally received O-RAN certification (MICAS, June 2022)
- Kyrio OTIC in CO/USA (Host: CableLabs)

★ Application of two OTICs is expected.

- North America East (COSMOS)
- Japan (YRP)

The latest available certificates and badges can be checked from here:

https://www.o-ran.org/testing-integration#cb_catalogue

Why VIAVI for Open RAN

Addresses Time To Market

- Products are available today and are being used e.g. integration with all the major NEMs
- Addresses development in the lab by NEMs to field deployment and maintenance for operators
- 1st Open RAN fronthaul demo is Open RAN Alliance exhibition

One-Stop-Shop

- Broad portfolio of products available **NOW**
- Reliance on one vendor improves efficiency e.g. one contact for expertise, support, maintenance
- Addresses RantoCore NW testing, Field to Assurance, for deployments, monitoring and maintenance.
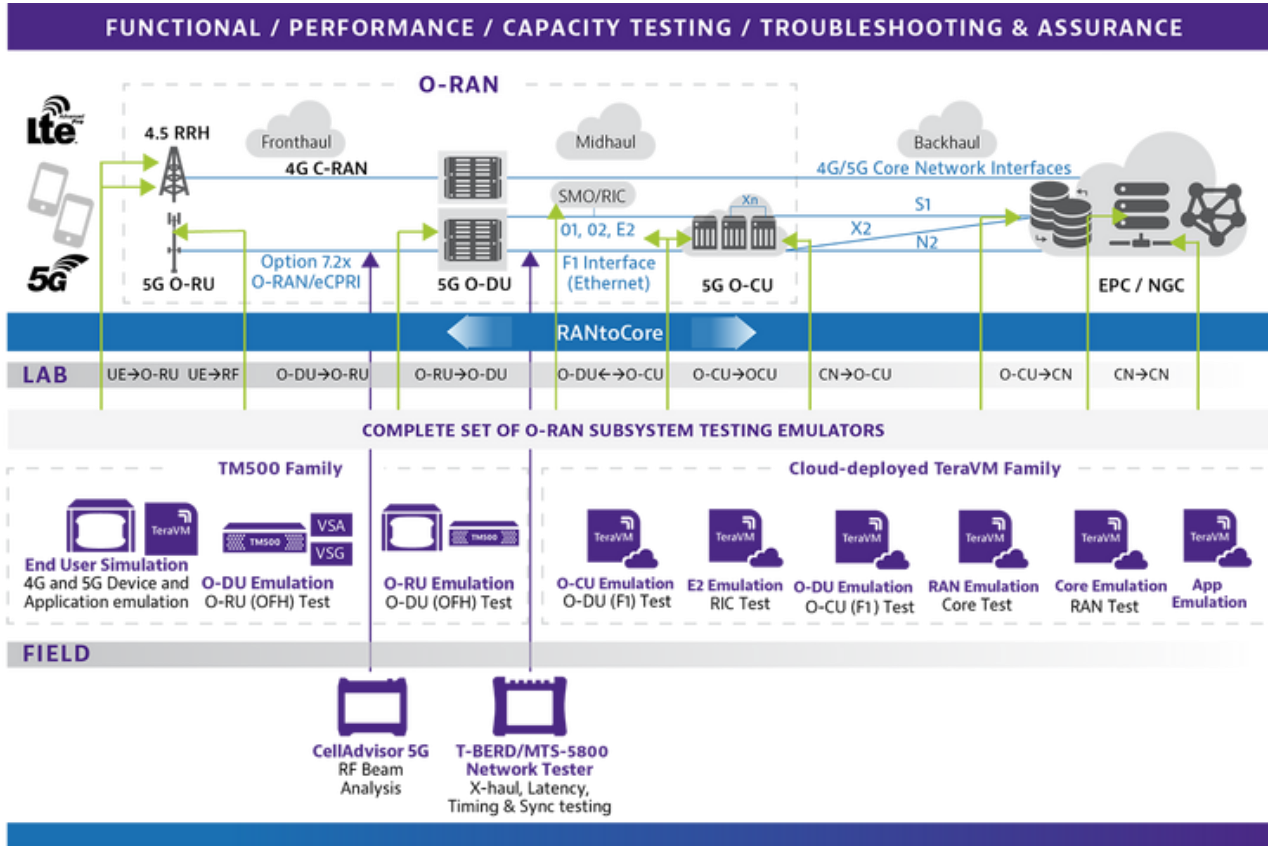
Managing costs and assets

- Products for traditional RAN testing can be re-used e.g. TeraVM family of products can be re-used for testing the O-DU and O-CU.
- Customers with a TM500 5G and features can re-use these assets e.g. purchased 3GPP features can be re-used without additional costs.

Superior global support

- Unparalleled global VIAVI support e.g. multi-level support from engineering to senior management, long term onsite presence on customer premises especially in Key accounts.
- Experienced and highly trained support teams e.g. vast experience working with NEMs and operators for 20+ years

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VIAVI 5G and O-RAN Test Portfolio

VIAVI Life Cycle Portfolio - Lab2Field2Assurance

VIAVI 5G Sites Installation Automation — 2

VIAVI 5G Sites Deployment Automation

3Z RFVision | MTS 5800 | NITRO 3D Coverage | StrataSync | OneAdvisor 800 | NITRO Fiber | NITRO Cable

VIAVI 5G Integration & Testing (Unit & System Lab Test)

NITRO Lab | TM500 | CA5G | MTS 5800 | TVM

1 — **VIAVI 5G Lab & Benchmark Automation**

NITRO — All Life Cycle Data Captured for Enrichment, Analytics, and Reporting

VIAVI 5G Field & Operations Support

3

VIAVI 5G Field & Operations Support

OneAdvisor 800 | MTS 2000 | Fiber Inspection | MTS 5800 | NITRO Transport | 3Z RFVision

VIAVI 5G Optimization & Monetization Solutions

NITRO Mobile

4 — **VIAVI 5G Optimization & Monetization**

1 — **INTEGRATION & TESTING** → 2 — **DEPLOYMENT** → 3 — **OPERATIONS** → 4 — **OPTIMIZATION**

Contact for Inquiries

Viavi Solutions Inc.

Shinjuku Square Tower 7F, 6-22-1, Shinjuku-ku, Tokyo 163-1107, Japan

Tel: 03-5339-6886

Email: G.JPN.EMAIL.INQUIRY@viavisolutions.com

★ Special site ★

5G: https://www.viavisolutions.com/ja-jp/5g

O-RAN: https://www.viavisolutions.com/ja-jp/solutions/o-ran