IORS: Current Lab Capabilities

This is document is shared publicly on the IORS web page

Instructions

Copy this table to the bottom of the document. Tell us about your Open RAN lab capabilities.

Lab Capabilities	Responses
Organization name	Texas A&M RELLIS Innovation and Tech Campus
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	Home - Texas A&M RELLIS Technology & Innovation Campus
What are your lab's capabilities? What is your lab's focus?	LAB is WIP, seeking guidance regarding lessons learned, avoiding duplication, adding consortium value, risk reduction, and modeling feedback, via the RELLIS system wide proving ground. Large indoor and large outdoor space allowing for multiple vertical use case evaluations.
Number of Core vendors	1 Cisco SA and 1 Cisco NSA
Number of O-RU vendors	1 Nokia NR77, B48, NR260
Number of O-DU vendors	1 Nokia
Number of O-CU vendors	1 Nokia
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	RELLIS is seeking to evolve the existing outdoor private cellular network covering 800 acres in FY2025. Seeking to realize disaggregated ubiquitous architecture with SMO/RIC/API apps/Slicing where emulation in other labs can be brought into the commercial grade proving grounds to obtain inference data to improve

Lab Capabilities	Responses
	models. Currently of interest is OTFS, beam optimization, Delay Doppler, and how to interface ORAN elements with legacy components.
Briefly describe your testing capabilities (2 to 3 sentences)	Have consulted with Spirent, Viavi, R&S, and KeySight, seeking to be budget conscious by not duplicating resources which exist at other labs, but to have the proper lab interfaces to ensure secure data transfer into the RELLIS innovation architecture, applying calibration standards, variable reduction, data collection and conversion into information via on site GPU resources, to further support existing labs (ORCID/ACCoRD/VALOR/NE/VT/INL/etc).

Lab Information

Lab Capabilities	Responses
Organization name	OpenAirInterface Foundation
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	www.openairinterface.org, O-RAN plugfests.
What are your lab's capabilities? What is your lab's focus?	Core Network, RAN stack testing (O-CU, O-DU), E2E testing, indoor/outdoor drive testing
Number of Core vendors	4
Number of O-RU vendors	5
Number of O-DU vendors	2
Number of O-CU vendors	2
Number of RIC vendors	3

In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	We are the home to OAI software - we have all the end to end core, RAN, RIC (FlexRIC) software. We also work with O-RAN Software Community and Nephio on the infrastructure activities.
Briefly describe your testing capabilities (2 to 3 sentences)	We have the capability to host vendor O-CU, O-DU, RIC, O-RU, Core Network, SMO components and interoperate with them across different OAI components. We also have test-vendor gear in the lab. We work with accelerator vendors (in-line and look-aside). We are also capable of helping AI researchers and commercial players to build AI capability in the stack and to test with it.

Lab Capabilities	**Responses**
Organization name	NTIA/ITS Communications Research and Innovation Network (CRAIN) Laboratory
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	
What are your lab's capabilities? What is your lab's focus?	The CRAIN lab deployed a Tier 1 traditional RAN and are integrating Open RAN subsystems into the traditional RAN. The CRAIN lab has load testing capabilities and the ability to handover between traditional RAN and Open RAN. The CRAIN lab's initial focus is on interoperability.
Number of Core vendors	2
Number of O-RU vendors	2
Number of O-DU vendors	2
Number of O-CU vendors	2
Number of RIC vendors	0

In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	N/A
Briefly describe your testing capabilities (2 to 3 sentences)	The CRAIN lab can test interoperability between traditional RAN and Open RAN including handovers. The CRAIN lab has load testing capabilities.

Lab Capabilities	**Responses**
Organization name	VIAVI Automated Lab-as-a-Service for Open RAN (VALOR™)
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.viavisolutions.com/en-us/valor https://www.viavisolutions.com/en-us/literature/automated-lab-service-open-ran-valor-data-sheets-en.pdf
What are your lab's capabilities? What is your lab's focus?	VIAVI Automated Lab-as-a-Service for Open RAN (VALOR™) based on the NITRO® Wireless portfolio provides a fully automated, cooperative, open Lab-as-a-Service (Laas)/Test-as-a-Service offering dedicated to Open RAN interoperability, performance and security. The project is funded by the Public Wireless Supply Chain Innovation Fund.
Number of Core vendors	1
Number of O-RU vendors	2
Number of O-DU vendors	2
Number of O-CU vendors	2
Number of RIC vendors	0

In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Depending on demand, we can host srsRAN, Open Air Interface, Open5GS, O-RAN Software community in our Private Cloud.
Briefly describe your testing capabilities (2 to 3 sentences)	It is a hybrid lab (Cloud and on-prem in Chandler Arizona) with an RF anechoic chamber for FR1/2/3 OTA testing, with capabilities include: functional, conformance, interoperability, performance, and security testing of Open RAN network components (O-RU,O-DU,O-CU) on their own or in combination; also includes reference O-RU, O-DU, and O-CUs from reputable vendors.

Lab Capabilities	**Responses**
Organization name	COSMOS
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.cosmos-lab.org
What are your lab's capabilities? What is your lab's focus?	COSMOS is a state-of-the-art testbed for advanced wireless research, designed to support experimentation with next-generation technologies, including 5G and beyond. Located in the New York City metro area, COSMOS serves as an Open Testing and Integration Center (OTIC) for O-RAN. In addition to O-RAN-related PoC and certification activities, COSMOS focuses on dynamic spectrum management, edge computing, AI-driven wireless optimization, and secure, resilient network architectures. Its dense urban deployment provides a platform for collaborative innovation across academia, industry, and government
Number of Core vendors	4

Number of O-RU vendors	6
Number of O-DU vendors	3
Number of O-CU vendors	3
Number of RIC vendors	2
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	srsRAN, OpenAirInterface, Open5GS, OSC.
Briefly describe your testing capabilities (2 to 3 sentences)	

Lab Capabilities	**Responses**
Organization name	ORCID
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://orcid.us
What are your lab's capabilities? What is your lab's focus?	ORCID provides a complete telecom stack for operational readiness testing. With over 30+ network functions and field sites setup for end to end testing in the actual telecom environment.
Number of Core vendors	3
Number of O-RU vendors	1
Number of O-DU vendors	1
Number of O-CU vendors	1
Number of RIC vendors	0

In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	
Briefly describe your testing capabilities (2 to 3 sentences)	ORCID is enabled with a complete telecom stack to enable actual customer environment for end to end testing. Where we have both lab and field setup to do security, conformance, interoperability, functional, performance and operational readiness testing. ORCID team is leveraging automation to enable faster and accurate testing.

Lab Capabilities	**Responses**
Organization name	UNH-IOL
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.iol.unh.edu/ lylavoie@iol.unh.edu
What are your lab's capabilities? What is your lab's focus?	Hosting multi-vendor testbeds of O-RAN components to support interoperability testing of O-RAN systems. Activities include organizing reference blueprints of open source component deployments (i.e. end-to-end network, built from open source), and providing testing of those resources.
Number of Core vendors	0
Number of O-RU vendors	2 (T&M Simulated)
Number of O-DU vendors	0
Number of O-CU vendors	0
Number of RIC vendors	0

In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Active:Open Air Interface, Open5GS, Free5GC, O-RAN Software community In Development: srsRAN, Aether
Briefly describe your testing capabilities (2 to 3 sentences)	Testing is focused on end-to-end interoperability of O-RAN components. O-RU systems are currently simulated via Keysight and Viavi.

Lab Capabilities	Responses
Organization name	OSC Asia Pacific Lab (NTUST)
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://lf-o-ran-sc.atlassian.net fr.bimo@gmail.com
What are your lab's capabilities? What is your lab's focus?	provide environment for collaboration and support the development of code within the O-RAN open-source community to conduct Integration and testing and for academic research purposes.
Number of Core vendors	3
Number of O-RU vendors	2 + 1 RU-SIM
Number of O-DU vendors	2
Number of O-CU vendors	2
Number of RIC vendors	1
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Currently hosting O-RAN Software community, Open Air Interface, Open5GS, Free5GC,
Briefly describe your testing capabilities (2 to 3 sentences)	Testing is focused on integration for RAN and end-to-end testing of O-RAN RIC components with simulators.

Lab Capabilities	Responses
Organization name	POWDER OTIC, University of Utah
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.powderwireless.net johnsond@cs.utah.edu kwebb@cs.utah.edu kobus@cs.utah.edu
What are your lab's capabilities? What is your lab's focus?	Powder (the **P**latform for **O**pen **W**ireless **D**ata-driven **E**xperimental **R**esearch) is flexible infrastructure enabling a wide range of software-defined experiments on the future of wireless networks. Powder supports software-programmable experimentation on 5G and beyond, massive MIMO, ORAN, spectrum sharing and CBRS, RF monitoring, and anything else that can be supported on software-defined radios and O-RAN O-RUs.
Number of Core vendors	0
Number of O-RU vendors	2
Number of O-DU vendors	1
Number of O-CU vendors	1
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Open Air Interface, srsRAN, Open5GS, Free5GC, OSC near- and non-realtime RIC, OSC SMO, ONAP, ONF/LF SD-RAN
Briefly describe your testing capabilities (2 to 3 sentences)	We focus on automated, end-to-end testing of O-RAN components in conducted, indoor, and outdoor campus environments. We provide automated, ready-to-deploy "building blocks" that give users private instances of 5G and O-RAN open-source stacks in our RF environments,

	enabling a variety of interoperability testing and proof-of-concept demonstrations. We provide automated test workflows that run test software over end-to-end SUTs deployed from our building blocks or from bring-your-own-device commercial solutions.

Lab Capabilities	Responses
Organization name	CableLabs
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.cablelabs.com/
What are your lab's capabilities? What is your lab's focus?	Our lab is equipped with commercial, open-source and test gear for core and open RAN. In addition, we have COTS UEs and UE emulators. We have the ability to perform both conducted and over-the-air testing (with FCC experimental licenses). We have logging tools with virtualization and containerized solutions and an under-development automation framework. Our lab focuses on advancing and validating Open RAN technologies, particularly in conformance testing, interoperability testing, security testing, end-to-end network performance testing and RIC testing. Our focus also includes AI driven automation and network analytics.
Number of Core vendors	2
Number of O-RU vendors	1
Number of O-DU vendors	1

Number of O-CU vendors	1
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	1
Briefly describe your testing capabilities (2 to 3 sentences)	Our ORAN testing capabilities focus on validating interoperability, security, performance, and compliance with O-RAN Alliance specifications. We conduct end-to-end testing across disaggregated RAN components, including DU, CU, and RU, using multi-vendor setups and emulators.

Lab Capabilities	Responses
Organization name	University of the Philippines Diliman and the Open RAN Laboratory @ UPD
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	Email: open.ran@eee.upd.edu.ph (Website is on the works) Related links: https://www.usaid.gov/philippines/press-releases/jun-05-2024-united-states-philippines-step-closer-launching-first-open-ran-laboratory-manila https://www.asiaopenranacademy.org/aora-programs/network-of-labs-for-rd/
What are your lab's capabilities? What is your lab's focus?	The Open RAN Laboratory is established through a phased approach. The first phase will focus on the foundational equipment and essential functionalities of the laboratory that will support the workforce development initiatives of the Asia Open RAN Academy (AORA). This phase will lay the groundwork for subsequent phases, ensuring a robust foundation for further development. Phase 2 will build upon the foundations in Phase 1 by implementing advanced technologies and functionalities. Both Phases 1 and 2 will focus on workforce development, ensuring that engineers are equipped with the necessary skills and knowledge to navigate the complexities of Open RAN technologies. Lastly, Phase 3 focuses on real-world applications through field trials and the exploration of various use cases. Phase 1 is implemented by our vendor-partner Viavi and follows the VIAVI Automated Lab-as-a-Service for Open RAN (VALOR) setup. Phase 1 shall provide an end-to-end implementation from User Equipment (UEs) to Core with Open RAN in between: UEs connecting to Radio Units (RUs) that supports open fronthaul interfacing (eCPRI) to Distributed Units (DUs);

	and DUs connecting to open Centralized Units (O-CUs); all from different vendors to demonstrate interoperability. Hence, Phase 1 is expected to provide a fully automated, cooperative, open and impartial laboratory and testing setup which can be used to demonstrate Open RAN interoperability, performance and security.
Number of Core vendors	1
Number of O-RU vendors	2
Number of O-DU vendors	1 (vDU)
Number of O-CU vendors	1 (vCU)
Number of RIC vendors	1
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	We are using srsRAN and open 5GS in our Phase 1 setup.
Briefly describe your testing capabilities (2 to 3 sentences)	Currently establishing testing capabilities.

Lab Capabilities	**Responses**
Organization name	**KCCTech, LLC**
Where to go for more information	https://www.kcctech.com info@kcctech.com
What are your lab's capabilities? What is your lab's focus?	**KCCTech Open RAN Lab Testing & Field Deployment Capabilities in 3 Categories:** 1) Open RAN Private Networks Commercial Lab (LAAS): • P5G Deployment (Commercialization) Focused Testing (w/ CBRS Spectrum): • Interoperability Testing • UE Device Connectivity Testing • Application & Use Case Testing • Pre-Integration & validation testing for deployment • Post-Integration Troubleshooting Testing

	2) Open RAN - Community Lab & Training Development & Support: • TIP Community Lab in Telkom University (Bandung, Indonesia) Collaboration & Support in Indonesia • AORA Development & Support including Training in Philippines • USTDA/KOMINFO Open RAN Feasibility Study • Lab & Field with Parallel Wireless & Mavenir with 4 MNOs locally for rural areas focused in Indonesia. • Open RAN lab Development support in Philippines • Open RAN OEM Collaboration via ITRI in Taiwan 3) Open RAN - Public & Private Network Deployments: • OREX SAI (DOCOMO/NEC) - OREX Delivery Partner (Global) • P5G Open RAN - Enterprise & Private deployments in US and Global with MSPs • Other Open RAN deployments Globally in various Industries.
Number of Core vendors	Multiple
Number of O-RU vendors	Multiple
Number of O-DU vendors	0
Number of O-CU vendors	0
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	
Briefly describe your testing capabilities (2 to 3 sentences)	Interoperability Testing (Regression Testing), UE Device Connectivity Testing, Application & Use Case Testing, Pre-Integration & validation testing for deployment, Post-Integration Troubleshooting Testing.

Lab Capabilities	**Responses**

Organization name	ARA-OTIC, Iowa State University
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://wici.iastate.edu/otic/ https://arawireless.org/ otic@arawireless.org hongwei@iastate.edu
What are your lab's capabilities? What is your lab's focus?	ARA-OTIC is an O-RAN Open Testing and Integration Centre (OTIC) hosted by the Center for Wireless, Communities, and Innovation (WiCI) at Iowa State University (ISU). Leveraging ARA, the NSF Platforms for Advanced Wireless Research (PAWR) project on rural broadband, ARA-OTIC focuses on advancing the frontier of O-RAN through research and open-source initiatives, and it facilitates O-RAN adoption via real-world evaluation, demonstration, and pilot of O-RAN systems with applications in the loop. Besides typical OTIC facilities, ARA-OTIC provides an at-scale, field-deployed experimental infrastructure for research and innovation in far-edge wireless systems and their applications in precision agriculture, community services, and so on. In particular, ARA-OTIC features the first-of-its-kind, real-world deployment of long-range, high-capacity wireless x-haul and access platforms in agriculture and rural settings, ranging from the state-of-the-art crop and livestock farms to rural cities and including user equipment such as agriculture vehicles, robots, drones, sensors, as well as public safety vehicles and facilities. With wireless x-haul platforms operating at the 11 GHz, 71-86 GHz, and 194 THz bands and offering communication capacities up to 160 Gbps at distances up to 15 Km, the ARA x-haul exemplifies low-cost, high-capacity middle-mile solutions connecting remote rural communities and agriculture farms to the nearest wired Internet backbone. With

	5G-and-beyond Multiple-Input Multiple-Output (MIMO) systems operating at the 460-776 MHz, 3.4-3.6 GHz, and 27.5-28.35 GHz bands and with 14, 192, and 384 antenna elements per sector, respectively, the ARA radio access network (RAN) exemplifies massive MIMO wireless access platforms that offer high capacity and large cell radius through beamforming, thus reducing the required spatial density of RAN base stations and cost of rural wireless. Besides the aforementioned large-scale outdoor wireless infrastructure and the associated edge and cloud computing resources, ARA-OTIC also operates an indoor sandbox for testing and integration purposes.
Number of Core vendors	0
Number of O-RU vendors	0
Number of O-DU vendors	0
Number of O-CU vendors	0
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Open Air Interface, Open5GS, Free5GC, O-RAN Software community, srsRAN, Aether
Briefly describe your testing capabilities (2 to 3 sentences)	Testing is focused on end-to-end interoperability of O-RAN components. O-RU systems are currently simulated via Keysight and Viavi.

Lab Capabilities	**Responses**
Organization name	DOC, National Institute of Technology (NIST), Communication Technology Lab(CTL), Shared Spectrum Metrology Group (SSM)

Lab Capabilities	Responses
Contact information	azizollah.kord@nist.gov
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://www.nist.gov/ctl/spectrum-technology-and-research-division/shared-spectrum-metrology-group https://www.nist.gov/programs-projects/open-ran-research-nist
What are your lab's capabilities? What is your lab's focus?	SSM research focuses on developing measurement methods to quantify the ability of different vendors to interoperate with each other – a key tenant of the Open RAN architecture. SSM aims to develop rigorous, reliable, scientific strategies to define and quantify interoperability in concert with the Open RAN community. Beyond interoperability, SSM aims to develop tools to enable network operators to optimize a multi-vendor Open RAN system and maximize performance. Our advanced facility contains various RF measurement tools, anechoic and reverberation chambers, COTS Open RAN, UE emulators, SDRs, and automation code.
Number of Core vendors	Radisys
Number of O-RU vendors	Foxconn, Bentel, and WNC
Number of O-DU vendors	Radisys
Number of O-CU vendors	Radisys
Number of RIC vendors	0
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	None

Lab Capabilities	Responses
Briefly describe your testing capabilities (2 to 3 sentences)	

Lab Capabilities	Responses
Organization name	TIP Community Lab Telkom University
Where to go for more information (web links to lab information, lessons learned from lab set-up and testing, lessons learned about collaboration, etc.)	https://tip.telkomuniversity.ac.id/; https://www.tiptelu.com/ email : galihp@telkomuniversity.ac.id; deni.rosiska@tiptelu.com; ariefianto@telkomuniversity.ac.id;
What are your lab's capabilities? What is your lab's focus?	● Open RAN ● Open Wi-Fi ● Open Transport. Lab focus: Facilitating partners (vendors, MNO, infraco, and government) to do collaboration on developing open network adoption through trial, test & validation.
Number of Core vendors	
Number of O-RU vendors	Comba, Zlink
Number of O-DU vendors	Parallel Wireles
Number of O-CU vendors	
Number of RIC vendors	null
In addition to the above, how much open-source Core, RAN, and RIC software does your lab have?	Open source Core (i.e. Magma, free5GC), OpenAirInterface
Briefly describe your testing capabilities (2 to 3 sentences)	1. End-to-end integration (RAN, Transport, Core). 2. Typical scenario : RAN at TIP Lab Bandung Indonesia, Core Network at MNO's Core Testbed, Transport backhaul connected via FO or Microwave. 3. Adopting test cases from TIP and accommodating MNO's query.