An Aspire Technology Success Story

Stimulating Open RAN Adoption: Accelerating cost efficient transition from lab to field

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Introduction

Market forces in telecom networking equipment have become a geopolitical issue with the ban of Huawei in several western markets leaving only two viable vendor options for many operators. With governments declaring a state of market failure and policymakers intervening to stimulate sourcing diversification, pressure is rising on operators to embrace new entrants – especially in the biggest ticket equipment category of the Radio Access Network (RAN) where the Open RAN movement is receiving huge attention. [1]

Aspire Technology has firmly established itself within the emerging Open RAN ecosystem, from creating our Aspire Open RAN Lab to delivery of a diverse range of projects including radio integration, COTS hardware performance benchmarking and consultancy engagements with Tier 1 MNOs focusing on their Open RAN strategies and implementations.

Aspire, as part of a Telecom Infra Project (TIP) pilot project sponsored by Facebook and Vodafone, has demonstrated how a process called System Release Validation (SRV) can be used to solve the issue of pre-deployment integration and testing of a disaggregated multi-vendor end to end Open RAN system.

The Open RAN SRV pilot demonstrated the following value:

- 60% reduction in time to validate an Open RAN Release
- With SRV, Open RAN deployment timelines will accelerate by at least 1 year
- Operator TCO savings of at least $1.8Bn
- Open RAN vendor revenue gains of $3.4Bn over 5 years
- Ensure Open RAN readiness intercepts the MNO 5G investment window

Problem

The traditional Telecom network vendors developed hardware and software solutions for each Network Element (NE) of the Radio Access Network (RAN), integrated their entire end to end solution in-house and tested it to a level where the vendor had the confidence to promote the product to Mobile Network Operators (MNO). The MNOs insisted that the vendors performed this process of system test of their solution before it was deployed in their live networks. This one-stop-shop for a RAN solution has the advantage of a consistent feature roadmap and 'one throat to choke' for the MNOs when there are problems to resolve. Staff training within the MNOs was uncomplicated with a single vendor solution. Institutional knowledge of the solution and operational processes around it were easier to build given that all the Network Elements composing the RAN were from a single vendor.

With the advent of the disaggregated Open RAN architecture this will no longer the case, where the new reality is of application software from multiple vendors that is deployed on a mix of bare metal, virtualized or cloud native platforms with fully open interfaces, running on COTS Hardware and which must be integrated and optimized vertically.

This disaggregation presents a catch 22 for those MNOs who plan to deploy Open RAN. They need to minimize time to a successful live deployment of an Open RAN comprising multiple vendors, but who will now be responsible for the testing the integrated end to end system prior to release to market? Each operator doing this themselves would create a massive duplication of effort in the industry and inevitably slow down Open RAN adoption. How then do the MNOs gain confidence in an Open RAN solution? This is the challenge facing MNOs and Open RAN NE vendors. Solving it is critical to wide-scale adoption of Open RAN solutions.

OTIC (Open Test and Integration Centre) labs are operator-led initiatives focused on interface compliance testing to the standards defined by the O-RAN Alliance, that aim to facilitate the integration and testing of disaggregated RAN components. OTIC labs now provide and will continue to provide very useful environments to integrate disaggregated components but OTIC testing, as currently defined, stops short of addressing the problem highlighted in this paper in four important ways, that we call the 'four missing pieces' of the Open RAN puzzle.

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The 4 missing pieces of the Open RAN puzzle

1. There is an unmet need to test full end to end RAN systems – not just interfaces.
2. A release roadmap of the entire RAN system needs to be defined with – ideally - a 6-monthly cadence of releases, similar to that of the traditional vendor.
3. Permutations of vendors' products that comprise a full RAN system need to be validated and self-certified for compliance with a particular release at full RAN system level.
4. Testing functionality is not sufficient – performance, reliability, scalability, security, and other non-functional requirements also need to be validated.

With the number of possible vendor combinations ever-growing, the duplicated effort of each MNO doing its own validation at "goods-in" to address these four gaps - with little to no visibility whether other MNOs are testing the exact same vendor combinations will increase the duplicated effort exponentially, absorbing scarce resources of both MNOs and NEPs, quickly escalating to unmanageable proportions.

Some point to the System Integrator as a means of solving this problem. Unfortunately, it is extremely rare to find System Integrators with the highly specialized skills and experience to address the "four missing pieces" of the puzzle identified above. Especially difficult when MNOs have such stringent cost expectations for Open RAN. The System Integrator will expect a sizeable margin and if they cannot deliver on the "four missing pieces", then their margin will not be palatable to MON customers.

This important point was highlighted recently by one of the Open RAN NEPs in figure 1 below.

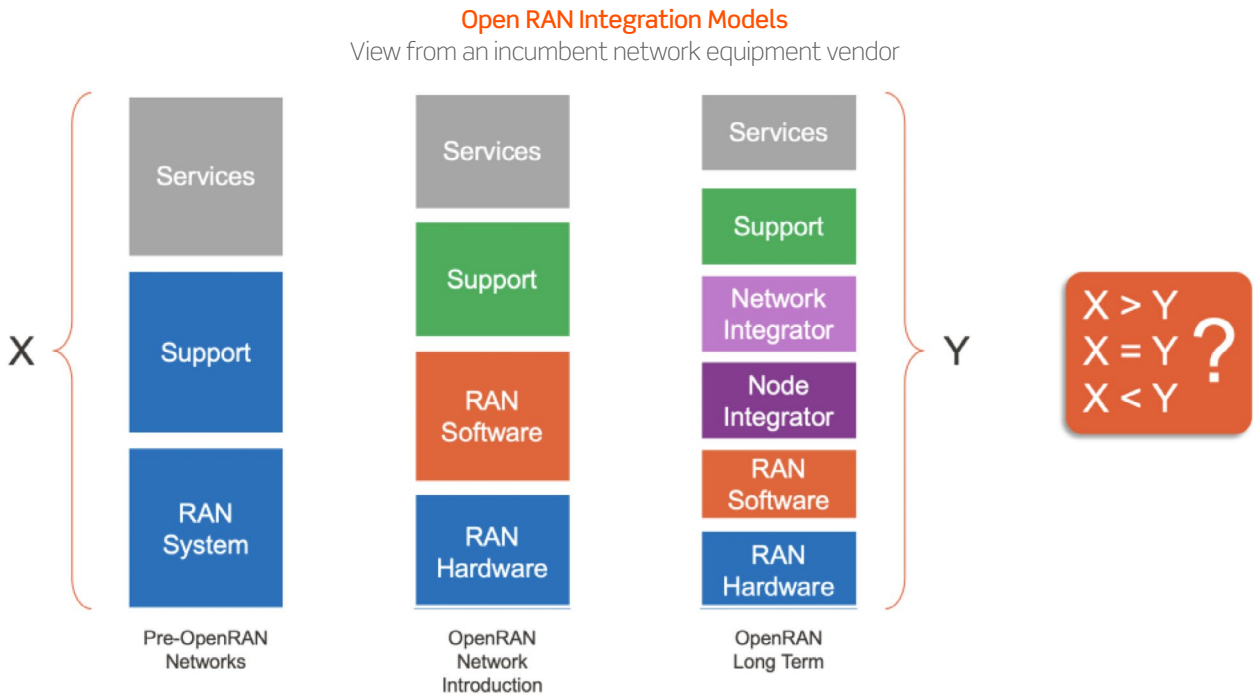


Figure 1: System Integrator 'margin stacking'
Source: Parallel Wireless

Solution

At Aspire we believe the solution to the challenge of pre-deployment integration and testing of an end-to-end RAN in the Open RAN ecosystem is to establish a common, franchised, devolved process called System Release Validation (SRV). SRV addresses all of the four 'missing pieces of the puzzle' required to stimulate Open RAN adoption. Figure 2 illustrates the intrinsic value of SRV versus the legacy way of working versus the "sub-optimal disaggregated" approach of proceeding with Open RAN without SRV.

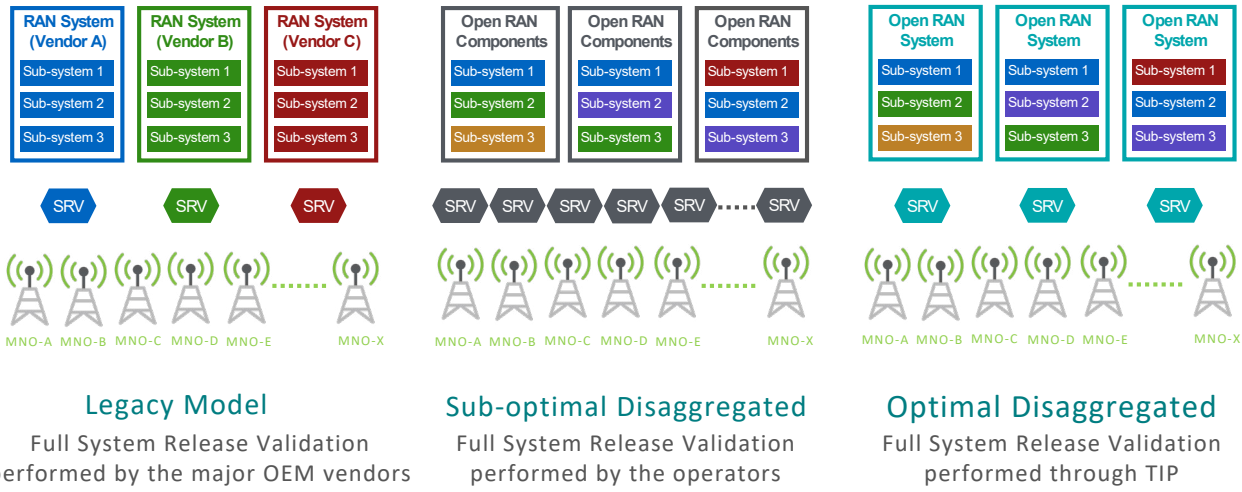


Figure 2: System Release Validation variants
Source: Jonesthefone Consulting

The SRV process is not intended to be executed by vendors or MNOs - but instead, by independent entities – SRV providers. To drive out duplication and increase agility and consistency, SRV providers will adhere to a common, franchised SRV methodology, collated and maintained by one of the Open RAN industry associations. This common methodology is vital to eliminate the 'margin stacking' effect of System Integrators developing their own closed validation service offerings and commanding significant price that erodes the Open RAN business case. SRV providers – acting as 'franchisees' in a federated model following this common methodology – will be responsible for the actual integration and coordination between the different Network Element vendors to validate the whole solution. This approach will yield higher confidence levels within MNOs for Open RAN solutions, avoid the duplicated effort of each MNO having to test their chosen vendor combination in their own OTIC labs and help accelerate the Open RAN adoption through live deployments in MNO networks.

To exhibit the benefits of the SRV process, Aspire Technology executed a 16-week pilot project as a Telecom Infra Project (TIP) funded initiative, sponsored by Facebook and Vodafone and involving several Open RAN Network Element vendors. We worked with the participating vendors and the sponsoring MNO to define a suite of test cases covering operational, functional, stability, performance, and mobility aspects. We then performed the integration of the End-to-End RAN within our Open RAN Lab, executed the agreed test suite to validate and benchmark the interoperability and system performance, liaised with the vendors to resolve faults found and prepared a final report detailing our findings which was shared with all the participants in the pilot project.

"Core network virtualization and disaggregation took 6-7 years to reach maturity and mainstream adoption. With Open RAN we don't have the luxury of that amount of time. By their nature, open multi-vendor ecosystems do not offer an efficient, common release management and validation process at full system-level. In this TIP pilot we proved that a franchise model for Open RAN System Release Validation engaging a network of independent test houses following a common methodology can restore the natural efficiency that was compromised as an undesirable side-effect of disaggregation – at a scope and scale that can address the entire market."

Andy Jones, Jonesthefone Consulting
(former Advisor to the Telecom Infra Project)

System Release Validation (SRV) addresses all of the four ‘missing pieces of the puzzle’ required to stimulate Open RAN adoption

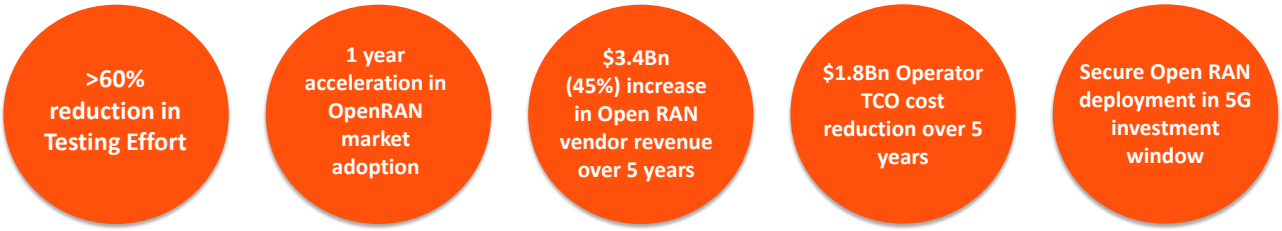
Results

The integration of the individual RAN Network Elements and execution of the agreed test suite of 45 test cases resulted in 56 documented issues across multiple products, processes and specification.

SRV Pilot successfully concluded in Q1'20

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 Open RAN products, combined into a full, deployable RAN system

Market Impact Forecast:



The identified issues were resolved in a timely manner by the responsible vendors, ensuring that the full test scope was completed within the allocated time.

Conclusion

The SRV process creates confidence in the functional, performance and operational capability of a specific combination of Open RAN products, combined into a full, deployable RAN system.

It is 60% faster to test an Open RAN release centrally with SRV vs the process being done individually per operator. Without the SRV concept, the Open RAN deployment timelines of MNOs will slip by at least 1 year, which impacts on the deployment window for 5G and will result in MNO TCO losses of at least $1.8Bn and Open RAN vendor revenue losses of $3.4Bn over 5 years.

Next steps

Even though Open RAN technology within the telecoms industry is still in its infancy, Aspire Technology have already established a strong track record in delivery of key projects which are helping accelerate its adoption.

These projects include:

- Radio integration and end to end performance benchmarking for disaggregated multi-vendor 4G/5G systems within our Aspire lab
- Open RAN live trials and deployment support across the globe
- Consultancy services directly into Operators to help them design and shape their Open RAN strategy

Talk with our Open RAN specialists about how our solutions and services can help your business.

References

[1] UK sets timeline for Huawei ban, embraces Open RAN, Fierce Wireless, Dec 1 2020

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