

CASE STUDY

A1 validates Cloud RAN options in its commercial 5G network in Bulgaria

- Validating centralized and distributed options with fronthaul and mid-haul distances exceeding 17 km
- Advanced automation capabilities for ease of management
- Efficient resource scalability and more flexibility for RAN deployments with Nokia anyRAN approach

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At A1, we want to deliver best-in-class 5G services to our subscribers. This Cloud RAN trial with Nokia is an important milestone in our cloud evolution strategy.

As a key part of our 5G Edge Playground program, Cloud RAN introduces flexibility to our network.

Together with Nokia, we validated both centralized and distributed Cloud RAN deployment options. Having served a 5G radio unit from a distributed unit more than 17 km away helps pave the path for leveraging the edge cloud whereas the collocation of the radio unit, distributed unit and centralized unit makes Cloud RAN fit into an extended deployment scheme.

We welcome the Nokia anyRAN approach, as it supports seamless integration and coexistence of both purpose-built and Cloud RAN deployments, with more freedom of choice in terms of cloud infrastructure while ensuring high performance and guaranteed security.”

Todor Tashev

Senior Director, A1 Bulgaria



A1 Group is one of the leading telecommunications providers in Central and Eastern Europe with more than 27 million customers across seven countries. In 2022, A1 Group saw 3 percent growth in the number of mobile subscribers.

A1 Bulgaria is part of the A1 Group. It's a fully convergent provider, offering a comprehensive portfolio of ITS, ICT, cloud and hosting solutions. A1 Bulgaria operates two own data centers in the country.

With a long history of partnership, Nokia is a key 5G Radio Access Network (RAN) as well as Core network supplier for A1 Group in multiple European countries.

This case study describes how A1 Bulgaria trialed Cloud RAN with Nokia both in a centralized and distributed deployment in its live commercial 5G network in the capital city of Sofia.

OBJECTIVE

Validating the capabilities of Cloud RAN in a live 5G network

A1 Bulgaria is an innovative operator looking for the latest technology solutions for enhancing customer experience.

A1 wanted to verify Cloud RAN capabilities in a hybrid environment with an existing implementation of purpose-built RAN. In the longer term, A1 Bulgaria considers to deploy Cloud RAN widely across its network.

The operator wanted to explore Cloud RAN in both centralized and distributed deployment. Having both options at hand will allow A1 to efficiently fit Cloud RAN into the existing transport network and data center infrastructure.

For the distributed deployment, validating the separation of the radio unit (RU) from the distributed unit (DU) by a distance close to the

theoretical limit of about 20 km was of key interest. A1 also wanted to validate the disaggregation of the DU and the centralized unit (CU), as this is new compared to typical purpose-built networks.

Another objective of the trial was to assess the level of operational efficiency of Cloud RAN reachable through automation. For large-scale Cloud RAN deployments, the operability has to be on a comparable level to purpose-built RAN. Automation is essential for managing a multifaceted cloud environment.

The trial sites were situated in a business district and an urban area of the capital city, Sofia.





TRIAL SETUP

Automated, centralized and distributed Cloud RAN in the commercial network

Nokia worked closely with A1 Bulgaria to integrate the Cloud RAN configurations with the existing infrastructure of A1's commercial 5G network on the 3.5 GHz (n78) frequency spectrum.

The locations of the Cloud RAN trial were chosen from the sites existing in the commercial network in a way that centralized and distributed deployments could be validated. In the transport network, the attention was on the fiber length: the longest fiber length between the chosen sites was above 17 km, quite close to the theoretical maximum distance of 20 km between an RU and a DU.

The chosen setup also allowed the testing of the geographical separation of a DU and a CU by a similar distance.

The trial focused on 5G Standalone, the foundation for 5G innovation and for the evolution path to 5G-Advanced.

For the CU and DU implementation, a Nokia reference design on AirFrame servers was selected.

To evaluate the operational efficiency of Cloud RAN, the central and distributed units in the trial were managed with Nokia's open data center management and automation solution (NADCM) and the cloud infrastructure operations were managed and automated with Nokia Edge Automation Tool (NEAT).

RESULT

Cloud RAN integration, maturity, orchestration and deployment flexibility proven

The successful execution of the trial marked an important milestone for building and delivering future generations of cloud-based networks.

The end-to-end 5G data transmission (layer 3 calls) across the different distributed and centralized configurations showed the viability of these deployment options, including fronthaul and midhaul distances of more than 17 km.

The smooth integration of the Cloud RAN trial with the existing transport and 5G core network benefitted from Nokia's

unified anyRAN approach across purpose-built and Cloud RAN.

Furthermore, the trial proved that Cloud RAN data center hardware and CaaS software can be orchestrated efficiently with Nokia's open data center management and automation solution (NADCM) and with Nokia Edge Automation Tool (NEAT).

The demonstrated level of operational efficiency facilitated site infrastructure deployment and configuration, including 3rd party hardware and CaaS software.

From an organizational development angle, the trial provided A1 with insights about the kind of organizational expertise and competencies that will be needed for implementing and managing future cloud-based networks.

This trial demonstrated the progress that has been made toward the commercial viability of large-scale Cloud RAN deployments. A1 Bulgaria together with Nokia moved theory to practice in this evaluation of the end-to-end Cloud RAN deployment.



PERSPECTIVE

Cloud RAN stepping alongside purpose-built RAN

The insights in this case study are based on one of the early Cloud RAN pilots in Europe, reflecting A1's pragmatic approach to validating key aspects of the commercial feasibility of Cloud RAN. Those include deployment flexibility, smooth integration with the existing 5G network and automated orchestration.

The results show that Nokia is evolving Cloud RAN towards a solution, which will step alongside the purpose-built RAN. The Nokia anyRAN approach addresses

operator needs such as feature performance consistency and the choice of purpose-built RAN and Cloud RAN with options for data center and cloud infrastructure.

Based on close cooperation and co-innovation with an ecosystem of trusted cloud partners, Nokia anyRAN delivers a collaborative advantage to both operators and enterprises. It also extends the Cloud RAN server and cloud infrastructure options to best fit an operator's data center and edge cloud strategy.



Visit anyRAN webpage
to learn more

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At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.

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