5G O-RAN Base Station Technologies

An emerging 5G network deployment and business model that enables open, virtualised, and fully interoperable RAN, bringing more options for mobile operators.

Keywords:
- 5G, O-RAN, business model, open, virtualised, interoperable, standardised, mix-and-match RAN, RAN, software-defined, 3GPP, O-CU, O-DU, O-RU, PHY, MAC, Commercial Off-the-shelf hardware, COTS hardware, Radio Intelligent Controller, RIC, 5G NR

Problems addressed

- Limited choice of network equipment
- High CAPEX and low deployment flexibility of equipment
- Network resources not efficiently utilised, affecting user experience

By standardising and opening each interface (O-RAN), ASTRI has developed a new network deployment and business model that enables open, virtualised and fully interoperable RAN. MNOs can mix and match RAN equipment components from different suppliers, making more competitions, more equipment choices, and lower equipment costs.

Artificial Intelligence (AI) can be introduced via Radio Intelligent Controller (RIC) to optimise the network for different use cases.

Innovations

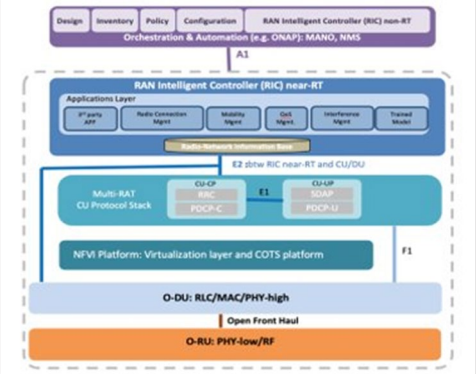
The flexibility of O-RAN connections among O-CU, O-DUs and O-RUs, and AI resource optimisation, are enabled by:

- O-DU fronthaul interface (between O-DU and O-RU) in 5G O-RAN standard
- O-CU and O-DU F1 interface in 5G O-RAN standard. O-RAN F1 interface provides means for interconnecting O-CU and one or more O-DUs
- E2 interface (between RIC and O-DU/O-CU) in 5G O-RAN standard enables AI/Machine Learning (ML) to cover non-real-time RIC
- 5G FAPI interface between L2/L3 software and L1

Key impact

- MNOs can use equipment from multiple vendors and still ensure interoperability
- The open environment is widening the ecosystem, expanding the number of vendors, innovations and options available
- AI can be introduced to optimise the network for different use cases
- New features can be added quickly for end users

Innovation snapshot



Project completed

- Ongoing

Applications

- Private network
- Enterprise network
- Software running on commercial off-the-shelf (COTS) hardware
- Non-real time and real-time RIC

Patent(s)

- US Patent No. 10,448,432 and CN Patent No. ZL201880000768.5
- US Patent No. 10,826,529 and CN Patent No. ZL201980000219.2
- US Patent No. 10,367,594 and CN Patent No. ZL201780000914.X

ASTRI Patent Search

Commercialisation opportunities

- IP licensing
- Technology co-development