What is Open Radio Access Network (Open RAN)?

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<u>In news</u>— With the accelerated deployment of 5G infrastructure, Open RAN is becoming increasingly critical for telecom service providers.

What is Open RAN?

- It is a key part of a mobile network system that uses cellular radio connections to link individual devices to other parts of a network.
- It comprises antennae, which transmits and receives signals to and from our smartphones or other compatible devices.
- The signal is then digitised in the RAN-base station and connected to the network.
- In the traditional set-up, Radio Access Network is provided as an integrated platform of both hardware and software.
- Therefore, it is difficult to mix vendors for the radio and baseband unit, and in most cases, they come from the same supplier.
- The idea of Open RAN is to change this, and enable operators to mix and match components.
- The Open RAN architecture allows for the separation or disaggregation, between hardware and software with open interfaces.
- With Open RAN, telecom players would have the flexibility to use in-house solutions or solutions from multiple vendors for RAN services.
- Network flexibility is another advantage of the Open RAN architecture. Being software-centric, it is scalable, agile and best of networks with improved network

performance using artificial intelligence and machine learning.

 Open RAN would reduce a telecom operator's network deployment cost as it is interoperable with other networks such as 4G.

Challenges-

- Open RAN is a new architecture, and not something that has been extensively tested.
- Therefore, there are several challenges in the path to implement Open RAN such as latency issues, operations and maintenance.
- Since interoperability is at the core of Open RAN, the issue of latency might not show up in controlled environment testing but at a later stage when the architecture is pushed to its limits.
- Servicing and maintaining a multi-vendor architecture can also pose a big challenge for service providers.

Radio access network (RAN)-

- It is a part of a mobile telecommunication system. It implements a radio access technology.
- Conceptually, it resides between a device such as a mobile phone, a computer, or any remotely controlled machine and provides connection with its core network (CN).
- Depending on the standard, mobile phones and other wireless connected devices are varyingly known as user equipment (UE), terminal equipment, mobile station (MS), etc.
- RAN functionality is typically provided by a silicon chip residing in both the core network as well as the user equipment.
- Examples of radio access network types are:
 - GRAN: GSM radio access network.
 - GERAN: essentially the same as GRAN but specifying

the inclusion of EDGE packet radio services.

- UTRAN: UMTS radio access network.
- E-UTRAN: The Long Term Evolution (LTE) high speed and low latency radio access network.
- It is also possible for a single handset/phone to be simultaneously connected to multiple radio access networks.
- Handsets capable of this are sometimes called dual-mode handsets. For instance it is common for handsets to support both GSM and UMTS (a.k.a. "3G") radio access technologies.
- Such devices seamlessly transfer an ongoing call between different radio access networks without the user noticing any disruption in service.