ZTE
Tomorrow never waits

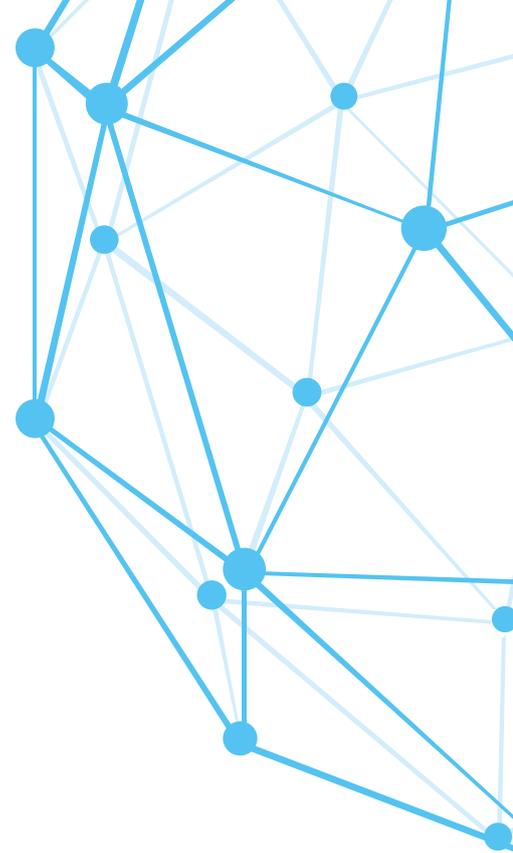# ZTE Cloud RAN

New Generation Radio Access Network Solution

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Drive – 5G-Oriented Radio Network Evolution

In the meantime when the 4G's global commercialization is still in the ascendant, the research and development of 5G has already been in full swing. The ITU predicts that the 5G will be commercialized in 2020. Compared with 4G, the 5G network becomes a "ubiquitous connectivity" network, which integrates into diverse radio access technologies and spectrum resources. It fully expresses the M-ICT concept, providing a smart and friendly network connecting peoples, people and things, thing and things. Generally speaking, the 5G network has the following characteristics.

- The further enhancement of mobile broadband experience: The moving users can enjoy Gbps level data rate anywhere anytime. The UHDV, VR and AR bring unprecedented immersive experience for users.

- The places with massive connections of IoT are the main application scenario of 5G. Compared with 4G, 5G's connections increase hundred times. It not only provides the connections for large-scale low power consumption with wide coverage IoT network, but also supports ultra-reliable and low delay connections for V2X, industrial control, real-time intelligent medication, etc.

- Various service types: In 5G, any person, company, or machine might be consumer or provider of information service. They constitute the wholly new relational digital ecosystem. In such ecosystem, various innovative business modules and data flows sprung up.

The 5G presents new challenges on RAN, such as processing performance, coordination capability, and service deployment. The RAN network is then required to keep evolving its architecture for future diverse demands when developing from 4G to 5G; meanwhile, the development of Cloud technology and big data technology, as well as the virtualization technology's mature application in core network lay the solid foundation for RAN architecture evolvement.
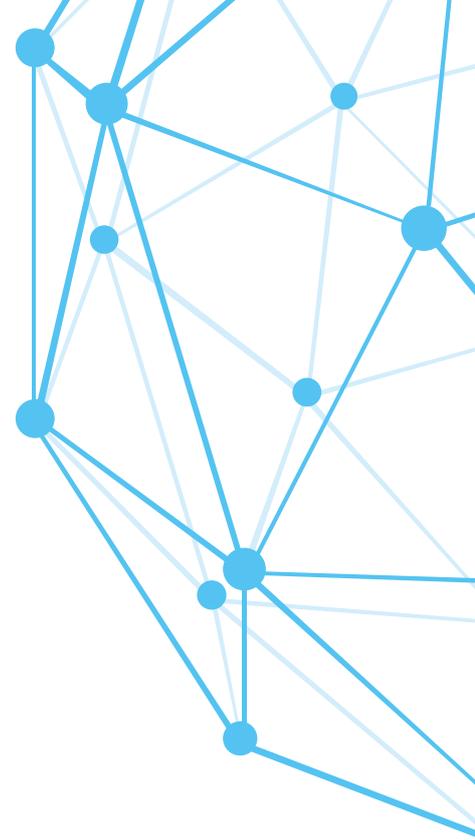
ZTE Cloud RAN –
New Generation RAN

Rising to the above challenges, ZTE promotes the new generation RAN solution -- ZTE Cloud RAN. It is designed to reconstruct the wireless network based on the Cloud processing platform, brings operators with the new concept to deploy network and create the new business values; it also helps operators fully meet the future performance challenges and various service requirements.

Based on the unified virtualization platform, ZTE Cloud RAN has achieved the fully virtual RAN, seamlessly integrating all modes' access (including 2G, 3G, 4G, WiFi, IoT and 5G) and massive connections. In addition, the platform, based on the Paas architecture, provides the open interfaces for the third party, which enables operators to rapidly deploy various services in volatile business circumstances, hence to build a triumphant ecosystem.
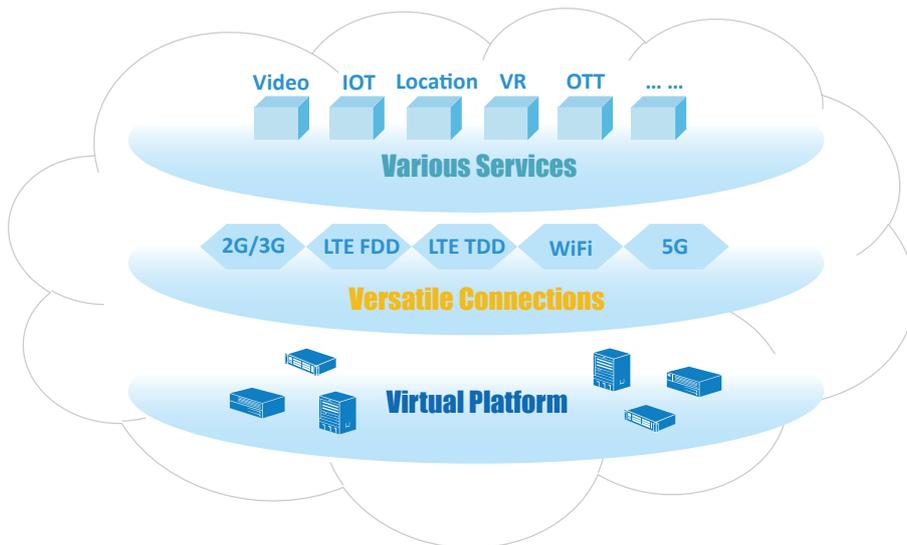

Figure 1: ZTE Cloud RAN Overview

Architecture of Virtualization Platform Based Cloud RAN

The NFV-based virtualization technology has been widely applied in CN, and greatly enhanced the network performance, flexibility and openness. ZTE Cloud RAN introduces the virtualization into the RAN side, and achieves fully virtualized RAN including controller, BBU, network management and related intelligent tools, based on the unified M-ICT platform (the integration of IT and CT service requirements). The Cloud virtualized platform enables the flexible architecture to separate service and hardware deployment, bringing the infinite possibilities for the future wireless network.

Concerning the network architecture, ZTE Cloud RAN seamlessly integrates the existing RAN and transmission network, assisting operators in enhancing its network performance, as well as supports the 5G-oriented Central Unit (CU) and Distributed Unit (DU) deployment.
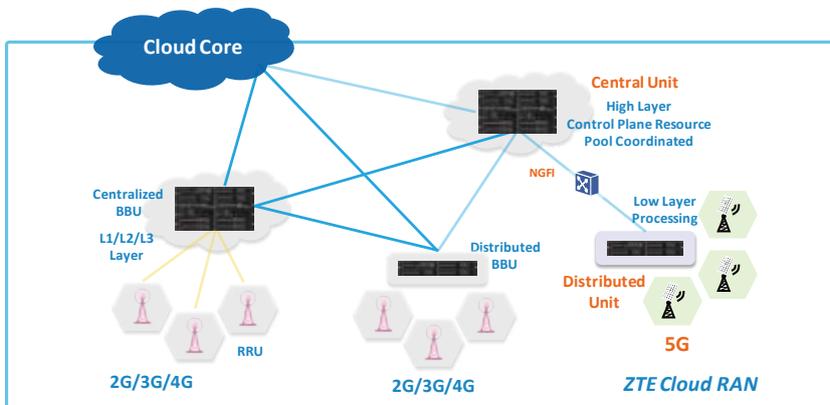

Figure 2: Network Architecture of ZTE Cloud RAN

Versatile Wireless Connections

ZTE Cloud RAN supports access of multiple technologies, including the present 2G, 3G, TD-LTE, FDD-LTE, WiFi and IoT connections; it is also available for 5G connection by Fronthaul over IP to coordinate and converge resources, which fully satisfies the future massive connections requirement, as well as the speed and capacity requirement of 5G.

The virtualization technology enables ZTE Cloud RAN more flexible for multiple modes' loading and processing. The slice deployment is applied for radio modes and services. Each mode can be loaded by being software defined through the virtualized BBU, who is based on the universal IT architecture. The unified CPU and storage resource pool inside the virtualized BBU dynamically schedules the resources allocation on the control plane in terms of various service loads; while the user plane's resource handling can be re-structured among each mode by software defining.
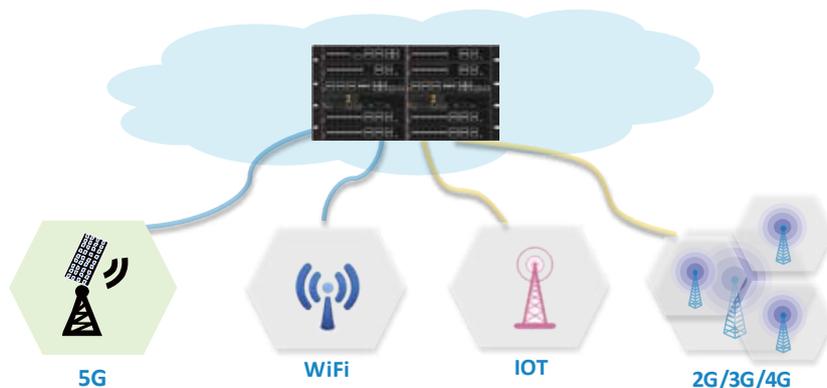

Figure 3: Seamless Convergence of Multi-Modes

ZTE Cloud RAN itself is an elastics network. Thanks to the virtualization technology, the hardware and software are decoupled; hence it's possible to expand the processing capacity of multi-modes by flexibly increasing the processing resources, and finally achieving the massive connections.

Agile and Diverse Service Deployment

The different business forms are emerging endlessly due to the massive wireless connections. The agile and diverse service deploying capacity of operators becomes the core competitiveness to win more markets. Being constructed on an open and unified platform, ZTE Cloud RAN supports mobile edge computing. While providing the base services for users, the interfaces are opened for the third party developers, who use the interfaces for the new applications and coordinate with the virtual CN to fulfill the service slicing, offering more innovative services and enabling the network to support the revolution of business mode smoothly.

Agile deployment of various services

| VR/AR | Caching | Location | ... |

| vBBU | MEC | 3rd Party API |

Virtual Software Layer
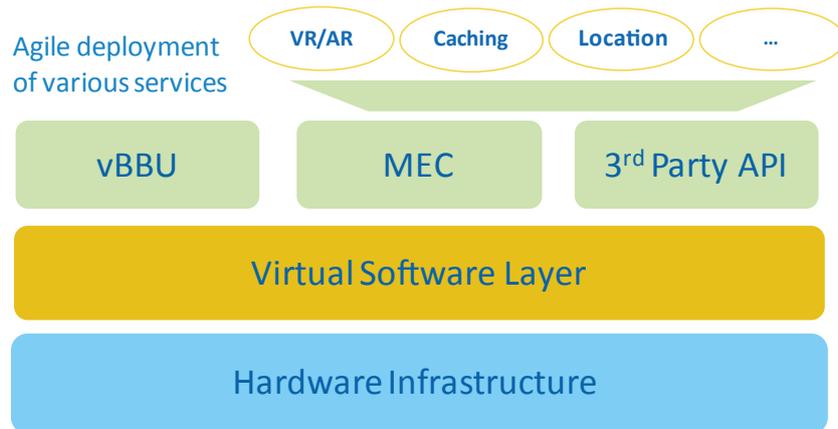
Hardware Infrastructure

Figure 4: Open Service Deployment of ZTE Cloud RAN

The open platform and the development of MEC transfer the services to the wireless side, which makes it closer to the actual mobile Internet services and provides the network users with shorter service delay and better experiences. Moreover, the on-premise service is available for more services, such as VR/AR, precise positioning, data distributing and content caching.

The Future is on "Cloud"

As the new generation RAN, ZTE Cloud RAN is designed for operators' future network evolution. It introduces the virtualization platform in RAN side to achieve the full modes' convergence and coordination. The hybrid architecture is seamlessly compatible with the existing network and the future 5G network. All the factors like the dynamic resources scheduling effectively satisfying the various services requirements; the elastic network capacity varying as demands, the strong MEC capability and open interfaces bring the powerful pulses of business for operators. Standing on the start point of post 4G network era, ZTE Cloud RAN is the best choice for mobile operators to evolve to the future 5G.