



By Edward Deng

President of Huawei Wireless Solutions

SingleRAN Pro enables simplified target networks in the 5G era, leading the MBB industry to new heights

5G is on the fast track for widespread commercial deployment in 2019. According to GSMA, 139 operators in 70 countries are currently conducting 5G trials, and 117 5G networks are expected to be deployed for commercial use by 2025. Huawei has already signed 30 5G commercial contracts with global operators, and delivered more than 40,000 5G base stations around the world.

With powerful network performance, Gbps-level data rates, and millisecond-level latency, 5G networks will open up new business opportunities. There will be new Cloud X business models for individuals (cloud applications, broad pipes, and smart terminals), Wireless Fiber solution for home

broadband (HBB), Cellular Internet of Things (C-IoT) for vertical industries, and a cellular vehicle-to-everything (C-V2X) network for the Internet of Vehicles (IoV) industry. Massive wireless connectivity has become an inevitable trend and a fully digitalized, intelligent life is coming.

However, new opportunities come with new challenges. OPEX

reduction is becoming operators' primary concern. The total cost of ownership (TCO) of a site is high; and today's multi-RAT (2G/3G/4G/5G) networks are complex and difficult to maintain. In addition, due to limited 4G network coverage, voice services in some regions have to fall back to 2G/3G networks, which impacts user experience with these services. Limited 4G coverage also means that

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the development of Narrowband Internet of Things (NB-IoT) and enhanced Machine Type Communication (eMTC) services will be restricted, which further hinders the phaseout of legacy 2G/3G networks. The critical issues for operators today are how to evolve existing networks and how to rapidly roll out 5G while continuing to support business development. SingleRAN Pro is the key to simplifying the target network in the 5G era, and to leading MBB industry to new heights.

"LTE Evolution+5G NR" is gaining the industry's consensus for 5G wireless target networks.

Network evolution over the next five to ten years can be divided into two phases: First, all sub-3 GHz bands will evolve to LTE and make the LTE network a fundamental network while 5G NR is being introduced. In the second stage, these sub-3 GHz bands will be gradually evolved to support 5G NR. We believe that the wireless target network in the 5G era will evolve to "LTE Evolution+5G NR" and the LTE and 5G networks will coexist for a long time.

SingleRAN Pro enables the simplified target network in the 5G era.

There are three elements of the evolutionary strategy for the 5G target network: site simplification, RAT simplification, and network intelligence.

Site simplification changes site deployment, enables full-outdoor base stations, and reduces site deployment difficulty and TCO.

The cost of site engineering, construction, and rental fees, and the acquisition of transmission resources accounts for more than 40 percent of site TCO. To reduce TCO, we need to change how sites are deployed.

Antenna reconstruction is required for 5G deployment on the new frequency bands. Huawei created the "1+1" antenna solution to address this challenge. With this solution, passive antennas for sub-3 GHz bands can be installed horizontally or vertically with Massive MIMO antennas, allowing for the accelerated deployment of Massive MIMO. In scenarios where it's difficult to run the optical fibers out to the sites, Huawei provides full-outdoor microwave products (supporting 10 Gbps+ data rate) to help handle the entire 5G backhaul, so that operators can roll out 5G networks faster.

To address the difficulty in site acquisition and high rental costs, Huawei has proposed the Super Blade Site solution. It consists of not just blade RRUs, BBUs, but also a blade power supply and a blade battery. These Super Blade sites can be installed on a pole, tower, wall, or rooftop, anywhere you want. This new solution features a modular design that doesn't require cabinets or even an equipment room, enabling full outdoor site deployment for the 5G era.

RAT simplification breaks through limits to spectrum use and realizes "LTE Evolution+5G NR".

The industry is transitioning from addition to subtraction. Instead of figuring out how to add a new RAT, the question today is how to retire one or two old ones. Modernizing

2G/3G networks means a transition to 4G/5G networks. Huawei recommends a three-step process. First, develop 4G into a full-service fundamental network, a network that can fully replace the coverage provided by 2G and 3G networks combined. Second, preferentially cultivate new 4G and 5G users while migrating 2G and 3G users to more advanced networks. Then finally, when the number of 2G/3G users declines to a certain level, retire the 2G and 3G networks.

Huawei has developed the CloudAIR™ and SuperBAND solutions to ensure a smooth transition. To ensure 4G coverage and a smooth transition between RATs, CloudAIR™ frees up valuable low-frequency spectrum for 4G networks by facilitating GSM/UMTS/LTE spectrum sharing. Universal 4G coverage is provided at low cost. The evolution from 4G to 5G is also ensured as a result of dynamic spectrum sharing between 4G and 5G NR. The SuperBAND solution aggregates scattered spectrum bands. It allows for flexible, unified spectrum allocation, maximizing the spectral efficiency.

Network intelligence implements a shift from NE-centric O&M to full-scenario automated operations by introducing automation capabilities into sites, networks, and the cloud.

The launch of automated intelligent (autonomous driving) networks goes far beyond a single innovative new product. It represents a significant breakthrough in network system architecture and business models, and introduces automation capabilities into sites, networks, and the cloud.

The sites will be provided with real-time analysis and fast, efficient decision making with extremely low latency. At the network level, operations and maintenance (O&M) will no longer focus on NEs. It will focus on specific service scenarios. Management and control functions will combine to provide predictions, reasoning, and identification capabilities. Mobile networks will be automated. And in the cloud, intelligent modeling and machine learning will be added to operators' cloud systems. Operators can have their AI models and services continuously upgraded. Currently, many operators see energy efficiency as an integral part of reducing OPEX. Huawei's PowerStar™ solution is a strong example of network automation.

At the 2019 Mobile World Congress, Huawei launched a series of solutions for autonomous driving mobile networks, including the MBB Automation Engine (MAE) and BTS5900 series base stations with powerful computing capability.

The past decade has witnessed rapid development and great prosperity in the mobile broadband industry. SingleRAN has led the industry in terms of technological innovation and business development, substantially reducing CAPEX. In the future, addressing the high OPEX will be the industry's top priority. SingleRAN Pro will help build a target network featuring site simplification, RAT simplification, and network intelligence, and continuously support operators' business development. Huawei is keen to collaborate with global operators and industry partners to keep innovating, realize 'Everything Wireless First', and bring the MBB industry to as new level of advancement and prosperity." 