WiMAX to 4.5G Pro TD-LTE

Fact sheet

Overview

With the emergence of new data intensive applications and the ever increasing usage of mobile broadband, the user demand is for mobile broadband that is much faster than before, easily accessible, and which provides seamless mobility.

WiMAX operators across the globe have identified the need to make the transition from WiMAX to a more robust, efficient and mainstream technology that can deliver higher data rates & revenues, has a larger global presence & ecosystem and which is future proof. At the same time, they want the transition to be straightforward, cost effective and one that allows reuse of their existing investments in spectrum, backhaul, cabling, towers and energy solutions.

Welcome to 4.5G Pro TD-LTE...brought to you by Nokia.
What is 4.5G Pro TD-LTE?

Nokia 4.5G Pro TD-LTE is an advanced LTE TDD based technology that delivers significant capacity and speed enhancements needed by operators (including WiMAX operators migrating to TD-LTE), as they build-out next-generation networks and which meets the demands of ultra-connected megacities.

Nokia 4.5G Pro TD-LTE is powered by the Nokia AirScale radio portfolio that can deliver ten times the speeds of initial 4G networks, making it possible for operators to offer gigabit peak data rates to meet growing demands from the programmable world, aligned with upcoming next-generation device launches. Using extended carrier aggregation techniques across up to five frequency bands, operators will be able to leverage their available paired (FDD) & unpaired (TDD) licensed spectrum, shared spectrum and unlicensed spectrum, in line with local national regulations.

Migrating from WiMAX to 4.5G Pro TD-LTE

For operators looking to migrate from WiMAX, Nokia 4.5G Pro TD-LTE provides evolution towards 5G performance. To support and facilitate 4.5G Pro TD-LTE migrations, Nokia has a broad portfolio of unique dual-band remote radios and market leading multi-pipe radios for various frequency bands including 1.9GHz, 2.3GHz, 2.5GHz, 2.6GHz radios and 3.5GHz. Our 3.5GHz (band 42) radio supports carrier aggregation and the recently introduced 3.5GHz (band 43) radio has the industry’s highest transmit power to enable high speeds, wide coverage and beamforming. The macro cell based solution is further complemented by a wide range of small cells (indoor and outdoor), with macro feature parity to fill coverage gaps and address hot-spot capacity requirements.

Further, Nokia 4.5G Pro TD-LTE software features and innovations including Smart Scheduler, TD-LTE Centralized RAN, Intelligent Beamforming (including 3D beamforming) and LTE-WLAN aggregation (LWA) allow even more capacity and higher data rates in the uplink and downlink.

These offerings make Nokia’s 4.5G Pro TD-LTE a compelling solution for operators to migrate from WiMAX to TD-LTE. By taking advantage of Nokia expertise, operators can reuse the investment in the majority of their infrastructure and spectrum, while enhancing their network with new features and capacity while supporting the latest smartphones and tablets to attract more subscribers.

Coexistence of WiMAX and TD-LTE requires interference mitigation between the systems. The Nokia AirScale Base Station, with support for multiple frame configurations and the use of appropriate radio filters, helps operators to mitigate interference and allows them be ready for TDD-FDD carrier aggregation.

Additionally, a smooth transition from WiMAX to 4.5G Pro TD-LTE requires careful analysis of the operator’s infrastructure and operational expenses (like power consumption) to guarantee the continuation and improvement of service quality. Nokia Global Services enables WiMAX operators to modernize their networks and make a seamless transition to TD-LTE with a turnkey approach.
Device ecosystem supports TD-LTE rollout

TD-LTE has clearly established itself as a main-stream technology for operators bridging to 5G, with spectrum available for 60% of the world population and 50% of the land mass. According to The Global Mobile Suppliers Association (GSA) July 2016 report, over 78 operators have launched TD-LTE networks in 46 countries that includes 23 TDD and FDD converged networks. Multi-band, multi-mode LTE-TDD smartphones, tablets, dongles, and CPEs (e.g. routers) are already commercially available from all major chipset and device manufacturers.

The GSA report, July 2016 also indicates that the number of available LTE-TDD devices has increased by seventeen times since March 2013, for a total of 2141 devices. Bands 38 (2.6 GHz) and 40 (2.3GHz) have the largest ecosystems, with 1328 and 1604 user devices respectively. The device availability for other bands is also growing with 82 user devices available for Band 42 & 43 (3.5GHz), a major boost for WiMAX operators using 3.5GHz band. More than 1400 LTE-TDD smartphones have been launched by all major manufacturers and most offer dual-mode (FDD and TDD) smartphones.

Proof is in the performance

Compared to WiMAX, 4.5G Pro TD-LTE opens up a whole new world of capabilities, services, innovations, evolution paths and growth opportunities that makes it a compelling solution for operators to migrate their WiMAX networks to 4.5G Pro. Here’s what Nokia 4.5G Pro TD-LTE delivers:

- Reduced latency: less than 15ms end-to-end latency.
- Higher data rates: up to 1Gbps downlink data rates.
- Enhanced provisioning: more services at lower cost and better user experience.
- Improved capacity: 2.5x to 10x more capacity compared to WiMAX.
- More flexible use of existing and new frequency bands.
- Simplified, IP-based flat network architecture with open interfaces.
- Reasonable terminal power consumption.

Fixed Wireless Access (FWA)

There is still a significant part of the world’s population that remains without internet access – 19% in the developed world and 66% in the developing world. In many cases, Fixed Wireless Access is the only viable option to address this population. This is where the Nokia FastMile for TD-LTE solution presents itself as a platform to provide the last-mile fixed wireless broadband connection to the home with cost efficiency and at a much faster pace. It brings a fiber like experience with guaranteed throughput to end-users while allowing operators to reuse existing rural mobile towers, housings, power, etc.

Further, it also enables operators to use TD-LTE as the platform to provide a converged solution for both mobile broadband users and Fixed Wireless Access users with maximum spectral efficiency and performance.
WiMAX to TD-LTE migration customer cases

Nokia is a TD-LTE supplier to most major former WiMAX operators. The following are examples where operators chose Nokia as a partner when migrating from WiMAX to TD-LTE:

- **Sprint, USA:** The world’s largest WiMAX operator rolls out TD-LTE with Nokia.
- **MTS, Russia:** Europe’s largest WiMAX to TD-LTE migration by Nokia.
- **Mobily, Saudi Arabia:** Nokia modernizes Mobily’s network.
- **Cota, Spain:** Cota partners with Nokia to introduce TD-LTE with WiMAX.

Nokia making headlines with TD-LTE

Some of the recent TD-LTE related announcements and success stories that hit the headlines are listed below:

- **Sprint and Nokia kick off US first TD-LTE 3 CC CA commercial deployment in Kansas.**
- **Nokia announces AirScale-powered 4.5G Pro & 4.9G as a smooth 5G path for operators.**
- **Nokia and MTS boost 4G speeds and coverage with commercial deployment of FDD-TDD carrier aggregation in Moscow.**
- **Nokia enables 3 Sweden to enhance mobile broadband customer services using TD-LTE-Advanced technology.**

And here is a glimpse of industry awards and recognitions for Nokia TD-LTE solutions:

- **LTE & 5G World Award under ‘Most Significant Development of a Commercial LTE Network’ category,** June 2016 for Nokia’s TD-LTE Centralized RAN.
- **Ranked highest in ‘ability to execute’ in Gartner’s LTE Magic Quadrant,** July 2016.
- **Four GTI awards in a row including the latest in Feb 2016 GTI Award for the category of ‘Outstanding Contribution on Innovative Solution & Application’.**
- **Marco Polo award for Rajiv Suri, CEO,** the highest honor accorded to a non-Chinese citizen, for driving the global development of TD-LTE, April 2015.

More information on TD-LTE solutions

For more information on our TD-LTE solutions, visit our website and also refer to our WiMAX to TD-LTE Migration White Paper and our latest TD-LTE videos on YouTube as below:

- **Nokia 4.5G Pro TD-LTE LWA.**
- **Nokia 3D Beamforming.**
- **Nokia Distributed Beamforming.**
- **Nokia Smart Scheduler’s Coordinated Scheduling.**
- **Nokia Intelligent Beamforming.**
Nokia is a registered trademark of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

Nokia
P.O. Box 1
FI-02022
Finland

Visiting address:
Karaportti 3, ESPOO, Finland
Switchboard +358 71 400 4000

Product code C401-0120039-WP-201609-1-EN

© 2016 Nokia