ZTE
Tomorrow never waits

Leading 5G Innovations

Table of Contents

ZTE

Connection is Accelerating

2G	3G	4G	5G
11 Years	10 Years	7 Years	5 Years

The Race to 1 Billion Connections

Source : Ovum

ZTE

5G Standard Development Plan

- ITU: Call for candidate proposal for 5G in the 2nd half of 2017; Finalize approval of 5G standards in 2020
- 3GPP: 1ST version of 5G standard in 2nd half of 2018; Full version will be available at the end of 2019
- Standard acceleration (Mar 2017): Non-standalone NR will be completed at the end of Year 2017

ZTE

5G Standardization and Latest Status

2017.03 | 2018.06 | 2019.12

R14 SI Phase → **R15** WI Phase 1 → **R16** WI Phase 2

- Key features are settled down: Wave form, numerology, frame structure, channel coding etc.

ZTE Contribution

- ZTE proposed FB-OFDMA as wave form, self contained frame structure, LDPC and Polar channel coding and MUSA as multiple access scheme

- RAN WI approved in March 2017，including stand alone (2018Q2)and non-stand alone (2017Q4)
- Mainly focusing eMBB and partial URLLC

ZTE Contribution

- ZTE led NOMA selected as study item

ZTE

Regional Development Plan of 5G

Push Heavily for 2020 Commercialization

Accomplished phase I of China 5G Test. Carry on Phase II Test in 2017

Aiming to provide 5G service for big sport event

Ahead of Industry

Aggressive for 5G Deployment

Probably to be the first country which provides commercial 5G service

Steadily promote 5G standard, deployment &commercialization

Grasp the Schedule of 5G Standardization

ZTE

Regional Preference for 5G Spectrum

	US	UE	China	Japan	Korea
mmWave	27.5-28.35GHz 37-38.6GHz 38.6-40GHz 64-71GHz	24.25-27.5GHz 31.8-33.4GHz 40.5-43.5GHz	24.25-27.5GHz 37-43.5GHz	27.5-29.5GHz	26.5-29.5GHz
Sub6GHz	TBD	3.4-3.8GHz 700MHz	3.4-3.6GHz 3.3-3.4G/ 4.8-4.99G/ 4.4-4.5GHz	3.6-3.8GHz 4.4-4.9GHz	TBD

ZTE

Table of Contents

ZTE

ZTE Target for 5G Earliest Commercialization

Product Release
Q1’2017

- 5G Product Portfolio
- mmWave Live Demo> 50Gbps

Commercial Pre-deployment
Q3’2018

- Rel.15 Compliant
- eMBB/URLLC
- NSA & SA Networking

Commercial Deployment
Q1’2019

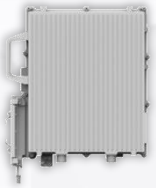
- Small Scale of Commercial Deployment
- More Spectrum Supported

ZTE

5G Radio Product Portfolio

3.5GHz

3.5GHz 4.5GHz



900MHz

700MHz

2016	2017	2018	2019~

15GHz

60GHz

28GHz

26/28GHz

39GHz

26/28GHz

ZTE

NOMA Improves Network Efficiency

Leaded by ZTE, NOMA project has been
successfully established as 5G NR Study Items in 3GPP

mMTC

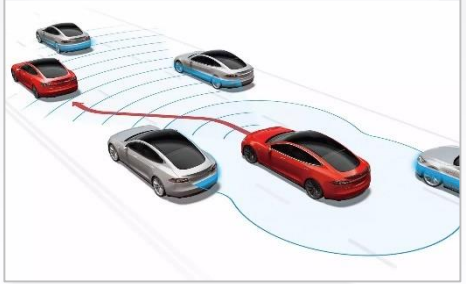
- Lessen signaling overhead
- Lower power consumption of device
- Increase massive connection number

eMBB

Infrequent Small Data

- Enhance spectrum efficiency
- Lower power consumption of device
- Lessen signaling overhead

URLLC



- Low latency
- High reliability
- High resource utilization efficiency

ZTE

ZTE Versatile RAN Architecture Suits for Different Scenarios

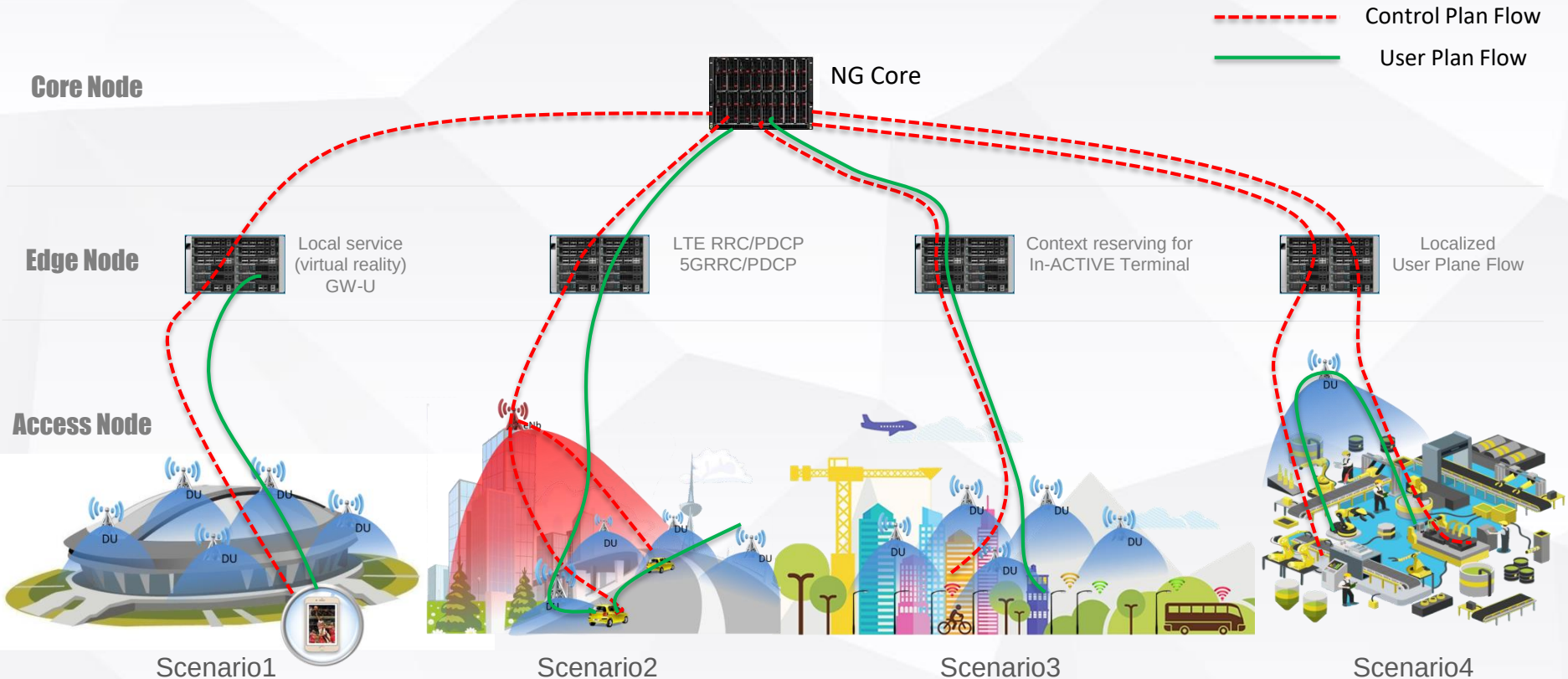


Table of Contents

ZTE

Footprint of ZTE 5G

2009

- Kickoff 5G study

2012

- Propose 5G virtualized cell concept

2014

- Release 5G white paper
- Propose 5G key technology
- First to test MM BS with CMCC

2015

- Launch pre5G MM BS
- First to propose UAI & CAS
- Establish R&D center in Tokyo

Footprint of ZTE 5G

2016 H1

- 5G prototypes released
- Two awards for Pre5G MM at MWC

2016 H2

- First to pass China 5G Test Phase I with Excellent performance
- ZTE's mmWave Channel Model accepted by ITU-R

2017H1

- Sub6GHz and mmWave product portfolio released
- Smallest & lightest AAU @ Sub6GHz

2017H2~

- China 5G Test Phase II
- Test with CMCC/TEF
- IoDT with CMCC and Qualcomm

ZTE

Strengthening openness and cooperation, Enabling new ecology

Vertical Industry

5GAA Automotive Association

Audi

DAIMLER

中国移动 China Mobile

docomo

vodafone

SK telecom

Standard Organization

ITU

3GPP

ngmn the engine of broadband wireless innovation

IEEE

Industry cooperation

IMT-2020

5G IA INFRASTRUCTURE ASSOCIATION

5GMF The Fifth Generation Mobile Communications Promotion Forum

Third Party

QUALCOMM

intel

KEYSIGHT TECHNOLOGIES

ROHDE&SCHWARZ

SPREADTRUM

ZTE

Cooperation with Global Operators

中国移动 China Mobile

Strategic Cooperation Protocol for IMT-2020(5G); Partner for 5G Joint Innovation Center

China unicom 中国联通

MoU with China Unicom for 5G Joint Innovation partnership

中国电信 CHINA TELECOM

MoU with Beijing Research Institute of China Telecom for 5G cooperation

SoftBank

Strategic Partnership with SoftBank 5G Joint Testing

kt

Strategic Partnership for 5G; Establish 5G Test Bed in Soul

Telefonica

5G Strategic Operation with Telefonica

T··

One of the First Partners for 5G Innovation Lab

mobile

MoU for 5G&pre5G cooperation

MoU for 5G&IOT cooperation with Telenet

Collaboration with China Mobile

中国移动
China Mobile

- In Apr 2016, ZTE signed 5G strategic partnership MOU with China Mobile.
- In Sep 2016, ZTE finished the 1st phase 5G test with China Mobile.
- In June 2017,ZTE launch the 3.5G NR field trial with China Mobile in Guangzhou.

Sub 6GHz 5G NR Field Test

In 2017，ZTE and China Mobile do the 5G NR filed test in Guang Zhou

中国移动 China Mobile

Guangzhou University City

Typical parks meet the requirements of 5G test environment

Initial deployment scale: 7 sites, continuous coverage of 5G NR

2017 emphasis of the test:

- 3.5GHz NR technology2017
- Single site performance verification
- multi-site network performance

ZTE

Collaboration with Telefonica

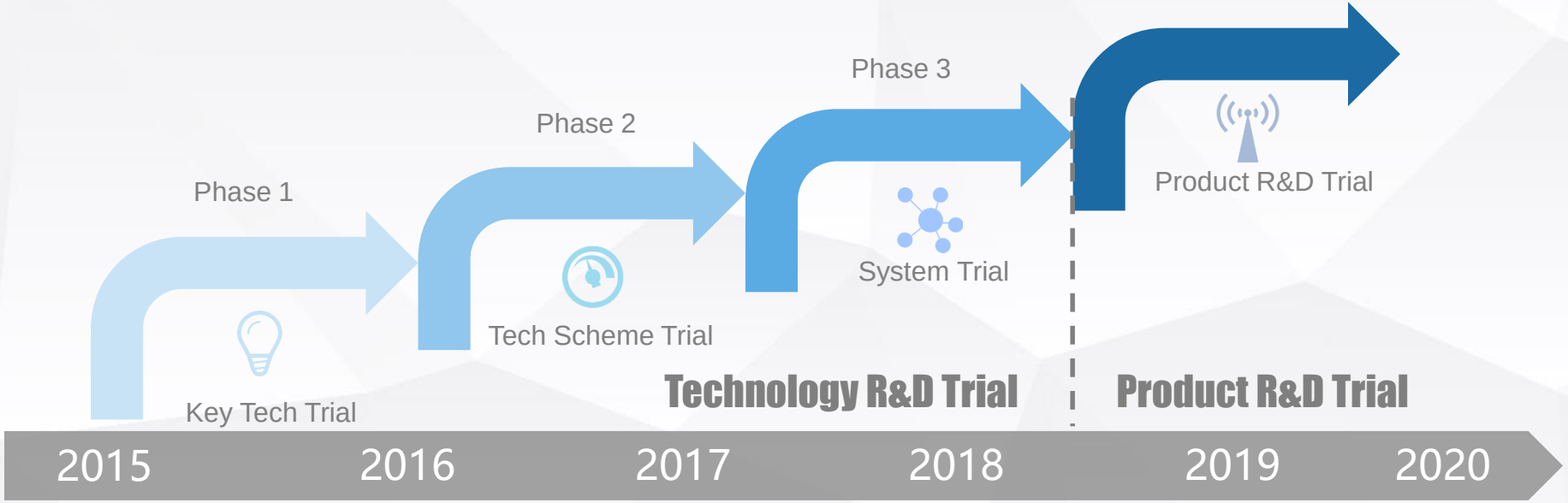
- ZTE signed MOU with Telefonica for 5G strategic partnership in April 2016.
- In Dec 2016, ZTE finished the 1st phase 5G test with Telefonica. The test focused on network architecture, which include NextGen CN on OP-PaaS and Adaptive U-Plane.

Industry 1st IoDT test @ Sub6GHz

- Based on whole industry chain, including UE & chipset vendors, radio & core network vendors and operator.
- The test is based on latest 3GPP NR version

5G Technology and Product Trial in China

China 5G Test: Carry on Phase II Test in 2017, focusing on technology scheme trial.



ZTE

Successfully Completes Phase 1 of China 5G Tests

Pass verification of 5G key technologies

- Massive MIMO/ New Multi Access/New Waveform/HF
- Separation of Control and Bearing/Reconstruction of network functionality
- End to end network slicing/MEC

Excellent Performance in Full Range Test

- Complete both HF and LF test
- Complete both Indoor and outdoor test for HF

Well-organized with High Efficiency

- Efficient operation of the project team
- Close cooperation among team members

ZTE

Test Phase II: Full Range Participation

All Seven scenarios

- Continuous wide-coverage
- Hotspot @mmWave
- Hotspot @Sub6GHz
- Low-power & massive-connection
- Low-delay & high-reliability
- Sub6GHz&mmWave hybrid networking
- Other hybrid networking

All Test Items

- Numerology
- Frame Structure
- Massive MIMO
- New Multi Access
- New Waveform
- New Coding
- …

Take lead in 26GHz Field Test

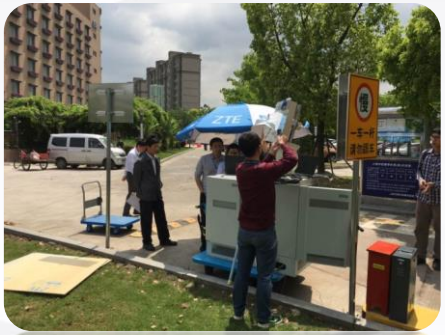
- mmWave RF Test
- mmWave Function Test
- mmWave Performance Lab Test
- mmWave Performance Field Test
- 26GHz/40+GHz
- 5G Product Portfolio

ZTE

First Vendor to Accomplish 26GHz Field Test

26GHz @Huairou, Beijing, China

40+GHz @Pudong, Shanghai, China



Radio Product Portfolio @mmWave

15GHz

60GHz

28GHz

26GHz

39GHz

ZTE

MUSA:Tens of Millions Connections Capability

When UE performs fully random resource selection with MUSA

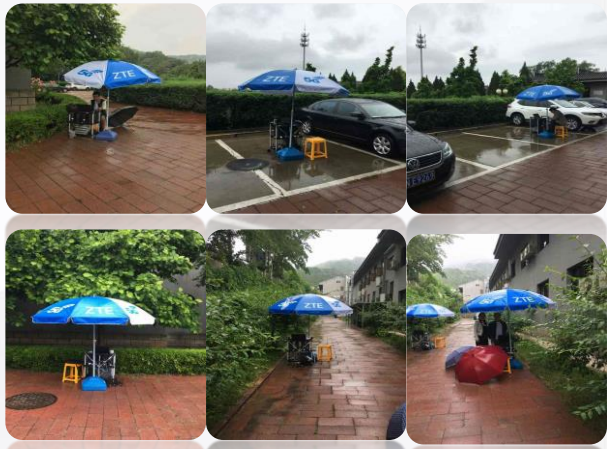
53,000,000

connections/MHz/hour

≈

600%

overload ratio



ZTE

Summary of ZTE 5G

Standard
Actively Promote the Standardization of 5G

Key Techs
Propose ZTE Characteristic Techs, including MM/MUSA/FB-OFDM/UFS

Target for the Earliest 5G Commercialization

Verification
Leading in China 5G test

Cooperation
Collaborate with leading operators, constructing healthy 5G ecosystem

ZTE


Thank You