From 4G to 5G
TDD Paves the Way for Future Mobile Broadband

Huang Yuhong

China Mobile
World’s Leading 4G, Boosting TD-LTE Ecosystem

The Largest Scale
1.42 Mil. Base stations
34% of Global LTE base stations

The Biggest User Base
4.9 Mil. Subscribers
31% of Global LTE subscribers

The Most Device Choices
2398+ Types of devices
70% are 150$ smartphones

Mass market VoLTE
313 cities commercially available

By the end of Oct. 2016
TD-LTE Laid the Foundation for 5G

Abundant TDD Spectrum for Super Broadband

Global TDD released licenses

<table>
<thead>
<tr>
<th>Frequency</th>
<th>License</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3 GHz</td>
<td>55</td>
</tr>
<tr>
<td>2.6 GHz</td>
<td>34</td>
</tr>
<tr>
<td>3.5 GHz</td>
<td>43</td>
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</tbody>
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B40(2.3GHz) & B41(2.6GHz) full TDD arrangement leads to high speed & large capacity

Now: 1:1
TDD Spectrum ≈ 1GHz
FDD Spectrum ≈ 1GHz

TDD vs. FDD

Future: 1:34
TDD Spectrum ≈ 34GHz
FDD Spectrum ≈ 1GHz

Abundant TDD spectrum

1540MHz Released by 2020

Above 6GHz

Group 80GHz
Group 50GHz
Group 40GHz
Group 30GHz

33.25GHz Candidate After 2020
TD-LTE Laid the Foundation for 5G ——

Massive MIMO, Key Technology of 5G in 4G

Technology Advantages

- Facilitate 4G to evolve to 5G
- Coverage enhancement
- Throughput improvement
- No change to existing TD-LTE device

Significant gain from Massive-MIMO than 8 antenna

Throughput improvement:
- Commercial Network: 100%
- Commercial Network +8 video users: 241%
- Commercial Network +16 video users: 280%
- Massive-MIMO: 343%

Facilitate 4G to evolve to 5G

No change to existing TD-LTE device

Tested in commercial network with 50+BS in biggest cities of China
Accelerate Network Transformation

Continue to Improve TD-LTE Network Performance

Uplink
- NOW 30Mbps
- 2018 3D-MIMO 256QAM 4layers
- >60Mbps Efficiency: 2x

Downlink
- 330Mbps
- >800Mbps Efficiency: 2x

2019 5CC
- >1.5Gbps Efficiency: 4x
- >120Mbps Efficiency: 4x
- 10Gbps Efficiency: 5x

5G
Foster Industry to Promote 5G Development

China Mobile 5G Development Plan

- **2013**: Requirements and Key Technologies Study
- **2016**: Standardization & technical test
- **2017**: Field Test
- **2018**: Large scale Trials
- **2020-**: Commercially Launch
5G Brings Cross-industry Innovation Opportunities

Three capabilities of 5G

- Enhanced Mobile Broadband (eMBB)
- Massive Machine Type Communication (mMTC)
- Ultra Reliable & Low Latency Communication (uRLLC)

Cross-industry convergence

 ENABLE

Internet of Everything

- Home
- Education
- Industry
- Transport
- Agriculture
- Service
Build 5G Joint Innovation Center

**PROMOTE**
Maturity of Communication Capabilities

**INCUBATE**
Integrated Innovative Applications

**DEVELOP**
Win-win Cross-industry business and ecosystem

**Areas**
- Communication Capabilities
- Internet of Things
- Internet of Vehicles
- Industrial Internet
- Cloud Robot
- AR/VR

**WG**
- C-RAN
- High frequency bands
- Universal module for IoT
- Business application

Open Lab
Collaborate for an Open and Innovative Platform

30 Cooperation Projects launched in Open Lab

Chengdu
Focus on Communication Capabilities, Intelligent manufacturing, Industrial Internet Innovation Project with Changhong

Beijing Core Laboratory
Focus on Communication Capabilities
Lab Test: C–IoT, Massive MIMO, High frequency bands communication...

Qingdao
Focus on Smart Home, Intelligent industrial park Innovation Project with Haier, Hisense

Shanghai
Focus on IoV Innovation Project with Huawei, SAIC Motor

Hangzhou
Focus on IoT Innovation Project of Smart City, Environment, Intelligent Transportation...

51 Partners
GTI: Continuing Construct Converged Industry Ecosystem From 4G to 5G

Gather 127 Operators, 130 Partners
85 TD-LTE Commercial Network, 97 In Progress
810mil. Subscribers

GTI 1.0
2011 ~ 2015

Successfully Realize TD-LTE Global Development

GTI: Global Technology Initiative

Continuing Construct Converged Industry Ecosystem From 4G to 5G
GTI : Continuing Construct Converged Industry Ecosystem From 4G to 5G

GTI 1.0
2011 ~ 2015

Successfully Realize TD-LTE Global Development

GTI 2.0
2016 ~

Construct Converged Innovation Industry Ecosystem

TD-LTE Evolution Commercialization
Promote 5G & Cross-industry Converged Innovation

TDD/FDD Converged Development
Mature TD-LTE Industry Chain
TD-LTE Scale Commercialization
GTI 2.0 Focus on TD-LTE Evolution & 5G Development

- Massive MIMO
- 4G&5G compatible platform
- Uplink Enhancement

5G Infrastructure
- Mainly Sub-6GHz
- Key issues on deployment

Module Standardization

Cloud Robot
- Communication requirement and solution

VR/AR

Internet of Vehicles

Internet of Things
- Module Standardization

Spectrum harmonization, market and technical requirement/suggestion, product driving, new business and service exploring
Global Cooperation, Bright Future!

To be with you, with a new dream!