

NB-IoT Open Scale Commercial “Golden Era”

Jiang Wangcheng
President of IoT Solution
Marketing & Solutions Department

Large-scale Deployment of NB-IoT Network Has Started

400K

Sites

2017

20M Connections

1.5M

Sites

2020

National Coverage

China MIIT : Notice on Promoting Mobile Internet of Things (NB-IoT) construction and development



Focus on ICT to Enable Verticals



Public utilities



Industry 4.0



Smart homes



Connected Car

OceanConnect IoT Platform

Connectivity
Management

Device
Management

Application
Enablement



2G/3G/4G/eLTE/
NB-IoT/eMTC/5G



Agile IoT gateway
Smart home gateway

Huawei LiteOS | Chips | Module

IoT Security



Security Control: E2E
Security Maintenance SOP



Platform & Cloud: Data
Security & Privacy



Network: Detection &
Isolation



Endpoints: Multi-level
Moderate Anti-attack
Capabilities

What we do:

- Wireless networks, enterprise IoT gateways, smart home gateways
- IoT platform (PaaS)
- IoT chips (Huawei LiteOS inside)
- Ecosystem development: enabling partners and telco to meet IoT needs

What we don't do:

- Applications
- IoT device development
- IoT device reselling
- End-to-end integration



OceanConnect IoT Platform Accelerates Vertical Digitalization



Ensure IoT Security, Shape Secure Ecosystem

IoT Security Theory: the majority of IoT endpoints have limited resources, and can only provide moderate anti-attack capabilities; IoT platform and network must have the ability to detect and isolate single-point attack, and to prevent attacks from expanding from points to surfaces.

- Unexpected Intrusion
- Illegal Message
- Abnormal Data Traffic
- Abnormal Position Variation

Malicious Endpoints
Detection & Isolation



Optimized DTLS+

1.1x

Power Consumption

VS

IETF DTLS

3.1x

Power Consumption

DTLS: Datagram Transport Layer Security

“3+1”IoT Security Solution



Security Control: E2E Security
Maintenance SOP



Platform & Cloud: Data Security
& Privacy



Network: Detection & Isolation



Endpoints: Multi-level Moderate
Anti-attack Capabilities

Chipset/Module Industry Inspires NB-IoT to Flourish

- Boudica 120 (700MHz/800MHz/900MHz) , Monthly shipment of 1M pieces starting from June 2017
- Boudica 150 (.../1800MHz/2100MHz) , Q2 ready for test , Q4 ready for commercial shipment

Chipset

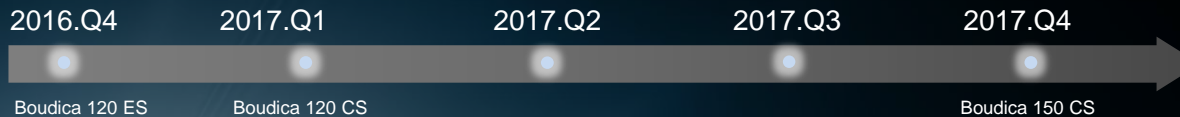


Module



Source: Internet

Chipset and Network are Commercially Available



Chipset

Boudica 120 (3GPP R13)

- Bands: 5/8/20/28
- DL 21.2Kbps / UL 15.6Kbps
- PSM / eDRX / cDRX
- Coverage Level Selection
- Paging
- 20dB Coverage Gain
- SMS, IP / Non-IP
- Single Tone
- Application for 3rd party integration (2017 Q2)
(TUP/CoAP/FOTA/LWM2M/DTLS/TCP/eSIM)

Boudica 150 (3GPP R13&R14)

- Bands: 5/8/20/28/3/1
- DL 80Kbps / UL106Kbps
- Positioning (OTDOA)*
- Multicast (SC-PTM) *
- Data over user-plan*
- Single Tone / Multi-tone
- AP Open for 3rd party

* Planning Feature



Network

SRAN12.0

GA NB-IoT

SRAN12.1

GA

Global Commercialization

SRAN12.1

eMTC

trial

SRAN12.1

GA

Project Start with Chipset Mature

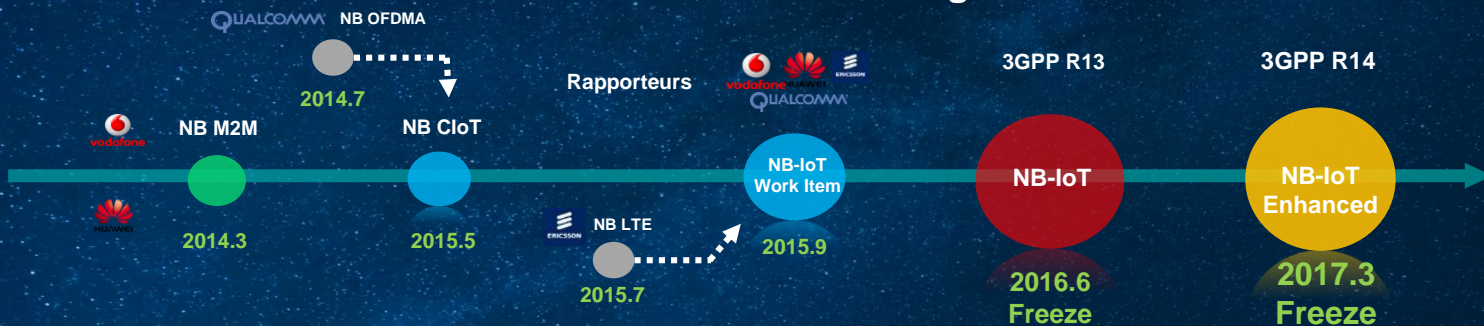
30+ NB-IoT Commercial Networks in 20+ Countries in 2017

Representing 50% of Global Population & 20% of Countries



NB-IoT Global Standardization Progress

3GPP NB-IoT Standard Progress



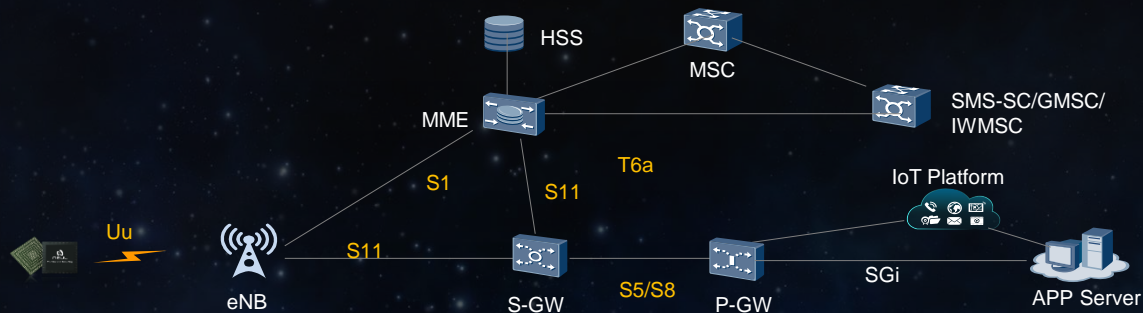
Industry Significance: NB-IoT will Become the only Technical Standard for Narrowband Scenarios

<p>3GPP TSG RAN Meeting #76 West Palm Beach, USA, June 5-6, 2017 Agenda Item 10.11.13</p> <p>Way forward on NB-IoT and eMTC evolution and UE capability</p> <p>Deutsche Telekom, BT, Telecom Italia, Vodafone, Huawei, HiSilicon, Nuu, Ericsson, Intel, China Telecom, MediaTek, Telefonica, LGU+, ZTE, Qualcomm, Nokia, CMCC, Sierra Wireless, China Unicom, Alcatel, Sequans, ITH, ITH, COMTE, Reliance-Io, Sony, Samsung, Veolia, Sprint, Dish, AT&T, CAT, LG, Orange</p>	<p>RP-171467</p> <p>Proposals</p> <p>Add to section 4.1 of the respective LTE_eMTC4 and NB-IoTenh2 WIDs as follows:</p> <ul style="list-style-type: none"> * It is out of scope of the Rel-15 eMTC WID to introduce a eMTC capable only UE category with a maximum supported channel bandwidth of less than 6 PRB in UL and DL. * It is out of scope of the Rel-15 NB-IoT WID to introduce a NB-IoT capable only UE category with a maximum supported channel bandwidth of more than 1 PRB in UL and DL. <p>Delete the following note from the Rel-15 eMTC WID:</p> <ul style="list-style-type: none"> * "Note: There is no intention to lower the minimum required UE capability compared to UE category M1 as part of this WI, i.e. the UE shall still support a PUSCH transmission of 6 PRBs."
--	--

New Way Forward at 3GPP RAN #76
Approved earlier this month, supported by major companies

- 3GPP Rel-15 will not define any new device category for eMTC that can support narrow band (less than 6 PRB) independently;
- 3GPP Rel-15 will not define any new device category for NB-IoT that can support wide band (more than 1 PRB);

NB-IoT Interoperability has been Successfully Tested by Operators



China Telecom

China Telecom has finished NB-IoT multi-vendor interoperability verification, between the modules, base stations, core networks and other end-to-end interoperability.

Accumulate the Uu, S1, S5 / T6a interface test 14 kinds of combinations, including terminal attachment / de-attached, random access, power control, paging, cell reselection and other functions and performance test.

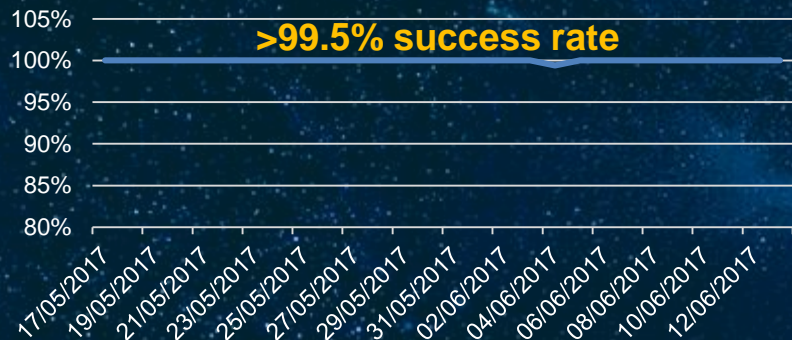
Vodafone

Luke Ibbetson, Vodafone Group's Head of Research & Development and Technology Strategy, said: "We have tested devices from Neul and Qualcomm against Huawei, Ericsson and Nokia systems in multiple regions. All of these vendors' NB-IoT Radio Access Network (RAN) technology has been successfully interconnected with Vodafone's IoT core network."

Excellent Performance Observed in Commercial Network

Shenzhen Water: 1200+ water meters

One time report success rate



Shenzhen Gas: 50 Gas meters

One time report success rate



NB-IoT is Driving Verticals to Digitization



Smart parking-Shanghai



Smart Lighting-Yingtian



Smart Water-Fuzhou



Smart Air-Conditioning-Haier

More

...



Internet Bicycle - oFo



Intelligent Smoke Alarms-DT



Smart Home Device-LGU+



Connected Sheep-Telia

More

...

**IoT currently is not a matter of technology or standard,
but an issue of how to create and share value**



GSMA GLOBAL MOBILE IoT SUMMIT

Moving to Global Deployment

GSMA全球移动物联网峰会

开始全球部署



28 JUN - 1 JUL 2017 - 2017年6月28日至7月1日



HUAWEI Platinum Sponsor



Silver Sponsor