NB-IoT (Narrow Band) Enables Digitization of Agriculture

Li Liran

Senior Manager, Cellular IOT, HUAWEI

NANJING, CHINA, 2018

agriculture SOLUTIONS FORUM 2018

HUAWEI

Future Cellular IoT Network = NB-IoT + eMTC + NR mMTC

Market Segment	Connections in 2020 (Billion)	Requirements	Technology
• CCTV(Camera) • In-vehicle Entertainment…	0.2B	l >10Mbps	NR mMTC
• IoT Gateway Backhaul • Wearable • Connected Elevator	0.8B	l ~1Mbps l Low power consumption	eMTC
• Sensors, Meters • Asset Tracking • Smart Parking • Smart agriculture	2B	l <100kbps l 20dB Coverage Gain l 10+ Years Life l <$5 Cost Per Module	NB-IoT

5G

LPWA: Low Power Wide Area

For R16, no NR based solution will be studied or specified for the LPWA use cases, LPWA use cases will continue to be addressed by evolving eMTC and NB-IoT

RP-180581
3GPP TSG RAN Meeting #79

NB-IoT is the Best Mainstream Technology for M-IoT

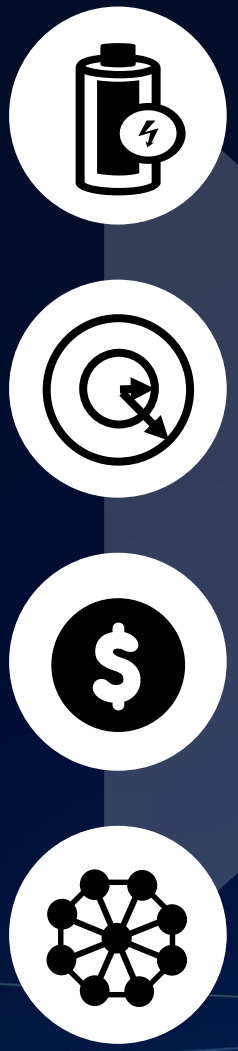
VS GPRS

10 years Battery
Traffic-based model

20dB
High coverage gain
Air-based environment

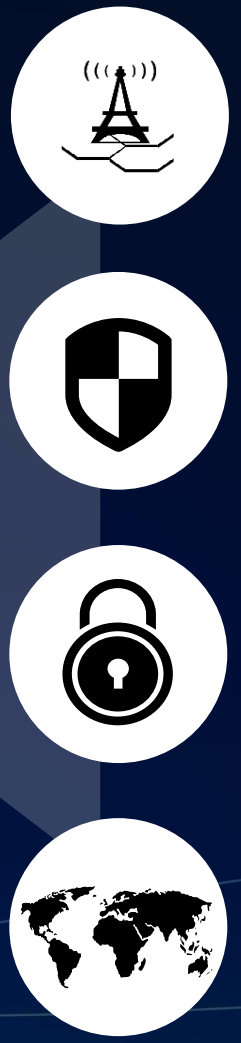
Less than 4$
Low Module price

100000
connections per cell



NB-IoT

VS Unlicensed Tech



Ubiquitous cellular coverage

High reliability (carrier grade)

High security

Rooming globally

NB-IoT Networks:
From Regional Deployment to Global Deployment

Main drafter of the agreement

2016.6 Agreement freeze

2017.12
31 Commercial network
@ **24** countries

2018.6
46 Commercial network
@ **28** countries

2018.12
89 Commercial network
@ **58** countries

2018.6 Deutsche Telekom and vodafone announce the completion of the world's first NB-IoT international roaming verification

NB-IoT Ecosystem is Ready

14+Chipset Vendors

HUAWEI

the **first** commercial chipset
10 million shipment in 2017

Qualcomm, Sequans, Nordic, Riot micro, RDA, Altair, MediaTek, arm, …

35+Module Vendors with Huawei Chipset

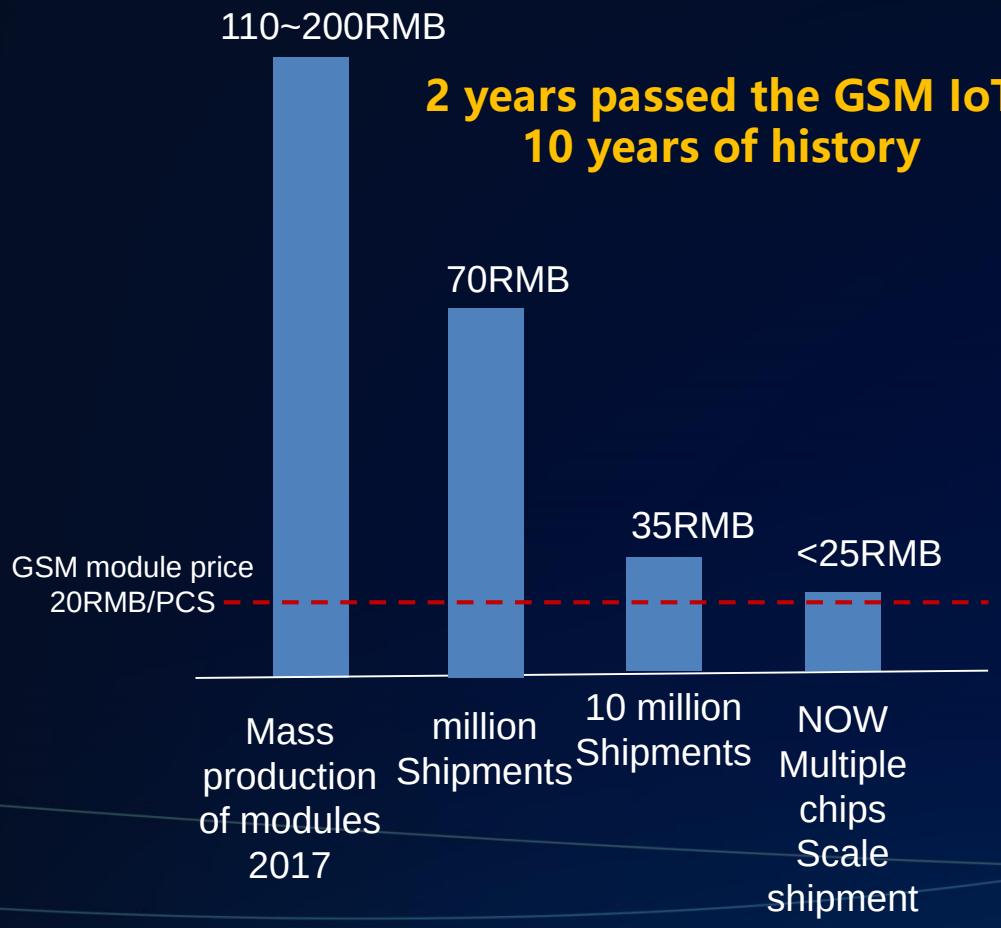
u-blox, Quectel, lierda, Telit, gemalto, Sierra Wireless, SIMCom, …

Note: Huawei does not research NB-IoT module

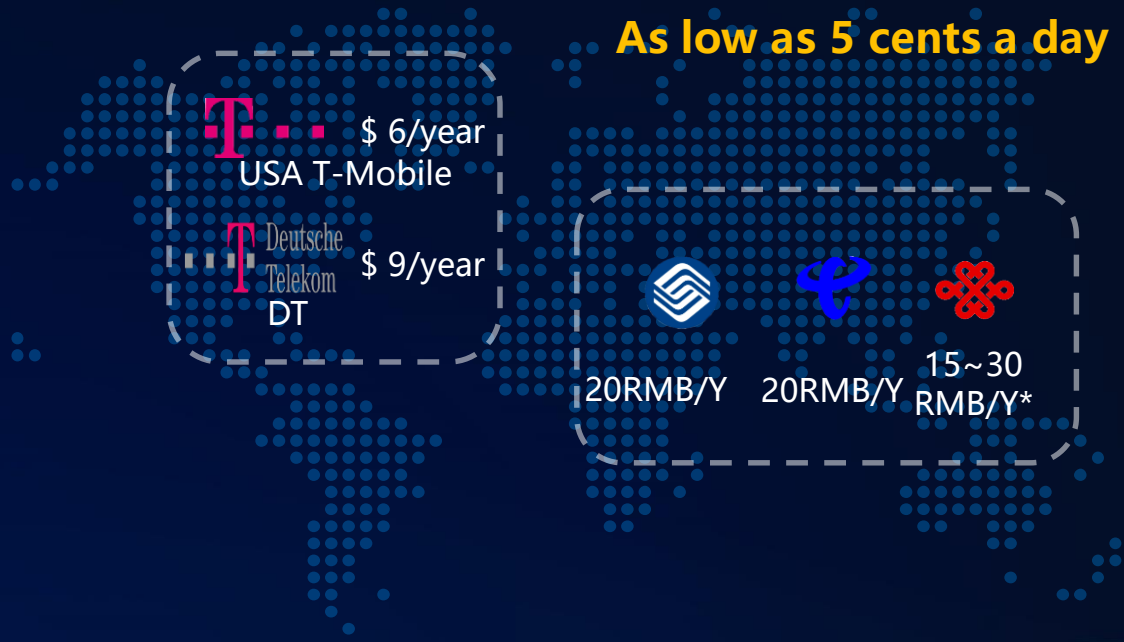
1000+ Device, Application & Integration

NB-IoT Commercial Costs are Significantly Reduced

NB-IoT close to GSM module price



Single user connection fee@China: 15~20RMB/year



*Unicom NB-IoT package, according to the flow rate

Boom Development of NB-IoT in 2018 in China

Smart parking

Shareing/Electric Bicycle

More…

4M+@2018

Smart transportation

Water meter

Gas meter

More…

5.5M@2018

Public affair

Smoke detector

Smart Hydrant

More…

1.5M@2018

Fire control

Smart locker

White goods

More…

0.5M@2018

Smart home

Connected cow

Agriculture

More…

0.5M@2018

Smart Agriculture

Smart light

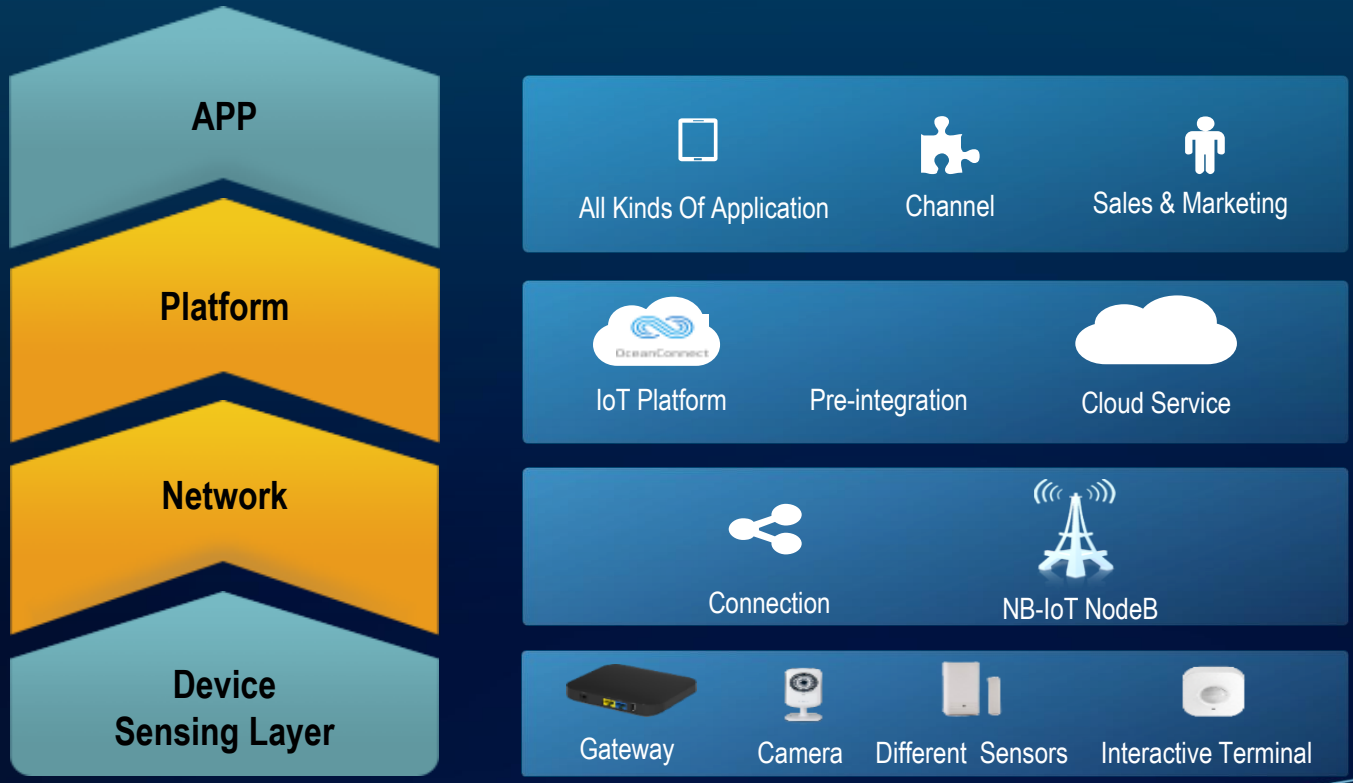
Smart dustbin

More…

0.2M@2018

Smart city

Basic IoT Architecture



Three Key Points:

Perception

Transmission

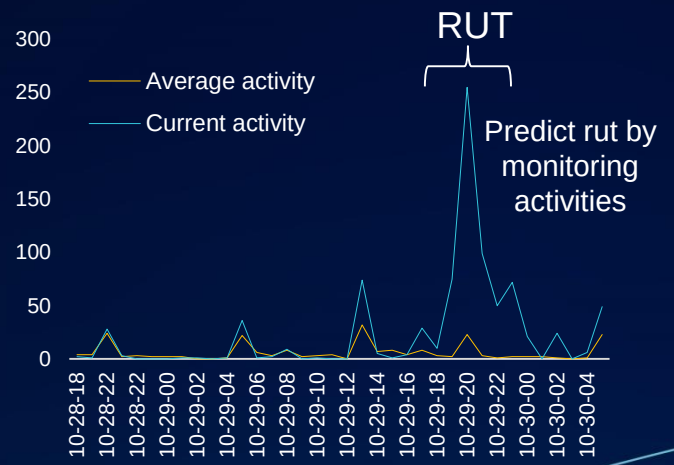
Intelligent APP

Connected Cow

AOTOSO

Milk Production should Fully Match with Rut Period

If missing one rut, 350USD will be lost



95%

75%

Rut Diagnosis

Resale IoT Device to Farmers
40USD per Device

Massive Connections per Cell
30 USD/5 years/cow

Smart Shrimping/Fishing Solution in Thailand

南京科沃信息技术有限公司
Nanjing CoreWell Information Technology Co.,Ltd.

Sensors:

- Temperature
- PH
- Dissolved oxygen

Monitor functions:

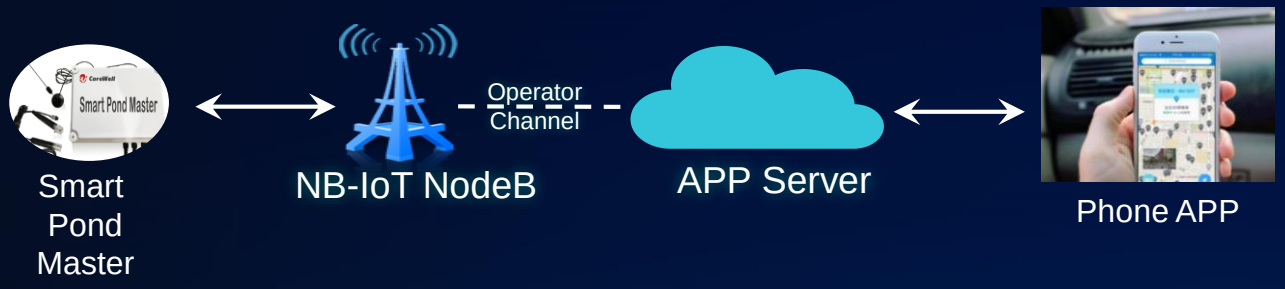
1.Monitor Dissolved oxygen
2.Monitor PH in pond
3.Monitor the temperature in pond

Equipment Control Remotely:

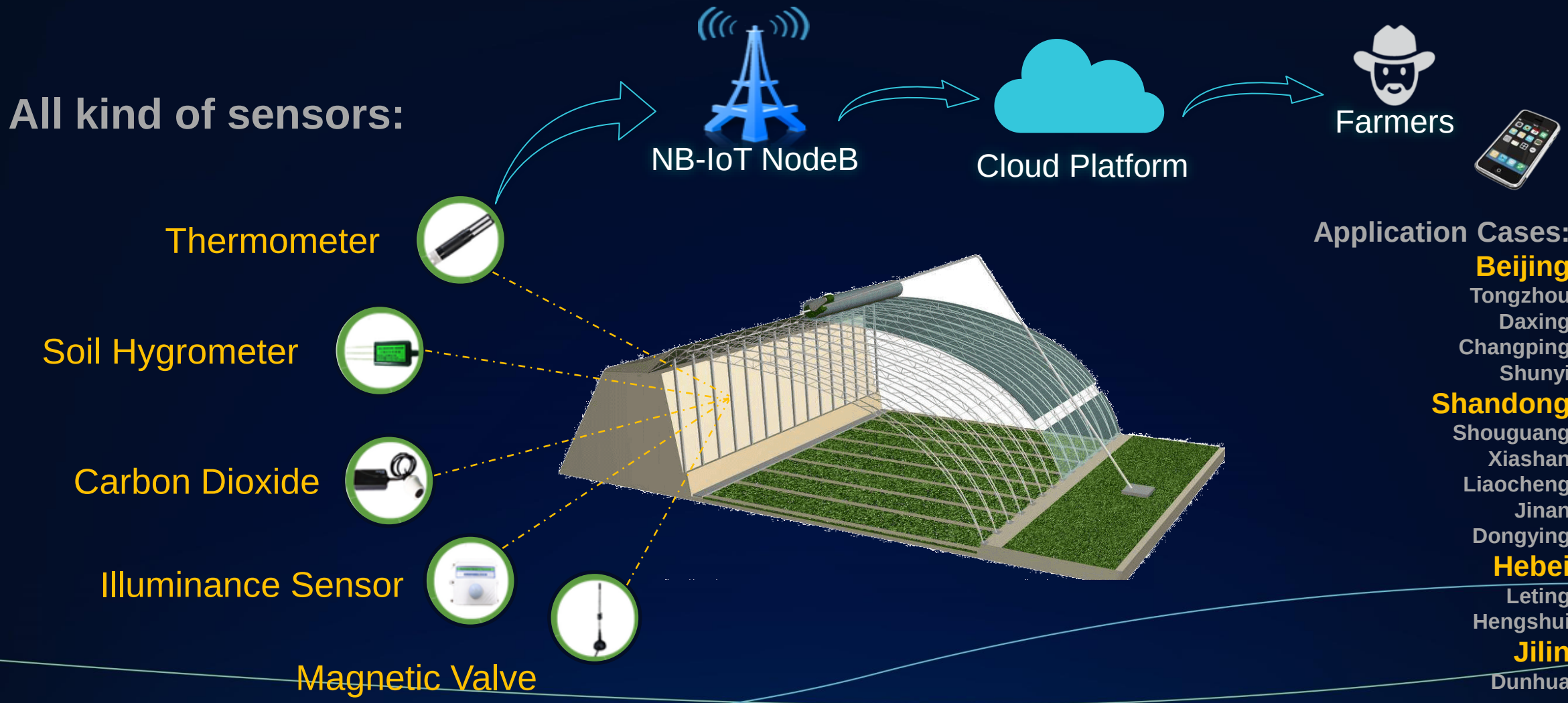
1.Switch off/on Oxygenator
2.Switch off/on Feeding machine

Platform functions:

1.Real time monitor the pond parameters
2.History pond data review
3.Switch off/on machine remotely
4.Auto Alerm when something goes wrong.
5.Equipment GPS.



Greenhouse & Smart Irrigation Solution



Application Cases:

Beijing
Tongzhou
Daxing
Changping
Shunyi

Shandong
Shouguang
Xiashan
Liaocheng
Jinan
Dongying

Hebei
Leting
Hengshui

Jilin
Dunhua

...

Everything @ Wireless!

Liliran@Huawei.com