



IPLOOK's NB-IoT Products INTRODUCTION

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IPLOOK Networks

Versions

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Contents

- Versions..... I
- Contents.....II
- 1 About IPLOOK..... 3
- 2 IPLOOK’s NB-IoT solution.....4
 - 2.1 The basic network diagram of IPLOOK’s NB-IoT solution..... 4
 - 2.2 EPC and NB-IoT product strategy.....4
 - 2.2.1 Deployment strategy..... 4
 - 2.2.2 License strategy..... 6
 - 2.3 Technological support for customers.....6
 - 2.3.1 Training.....6
 - 2.3.2 Guarantee and service commitment..... 7
 - 2.4 The Feature lists.....9
 - 2.5 IPLOOK’s EPC roadmap.....10

1 About IPLOOK

IPLOOK Technologies Co., Ltd. starts-up in early 2012, and formally founded with our new brand “IPLOOK” in Dec., 2014. IPLOOK specializes in the research and development of LTE core network products with flexible customized solutions and services. IPLOOK dedicates to be a leader in LTE 5G core network.

IPLOOK has successfully built a LTE product line to meet the requirements of telecom operators for LTE core network. Based on 3GPP standards and specifications, our products like MME /SGW /PGW/ HSS/ PCRF/ IMS/ VoLTE/ Wi-Fi Calling have developed with high capacity of user access. Up to now, such products have completed the IOT test of S1, S6a, S10, S11, GA, etc. with ZTE, HUEWEI, Fiberhome, Ericsson and many other small cell vendors to ensure high performance and good compatibility. IPLOOK has established a long term relationship with SPIRENT, and a SPIRENT Landslide C100 testing environment has also been constructed to undergo significant tests for the best performance and stability.

IPLOOK provides LTE network communication technology solutions, virtualized solutions of 4G/5G Cloud Computing based on NFV/SDN, related software and hardware product design, development. Committing to lead and promote LTE network market, IPLOOK dedicates to transform from communications equipment vendor to integrated services provider.

IPLOOK will continue to focus on LTE core network and spare no effort to provide the best services for all customers at home and abroad. Welcome to join us!

2 IPLOOK’s NB-IoT solution

2.1 The basic network diagram of IPLOOK’s NB-IoT solution

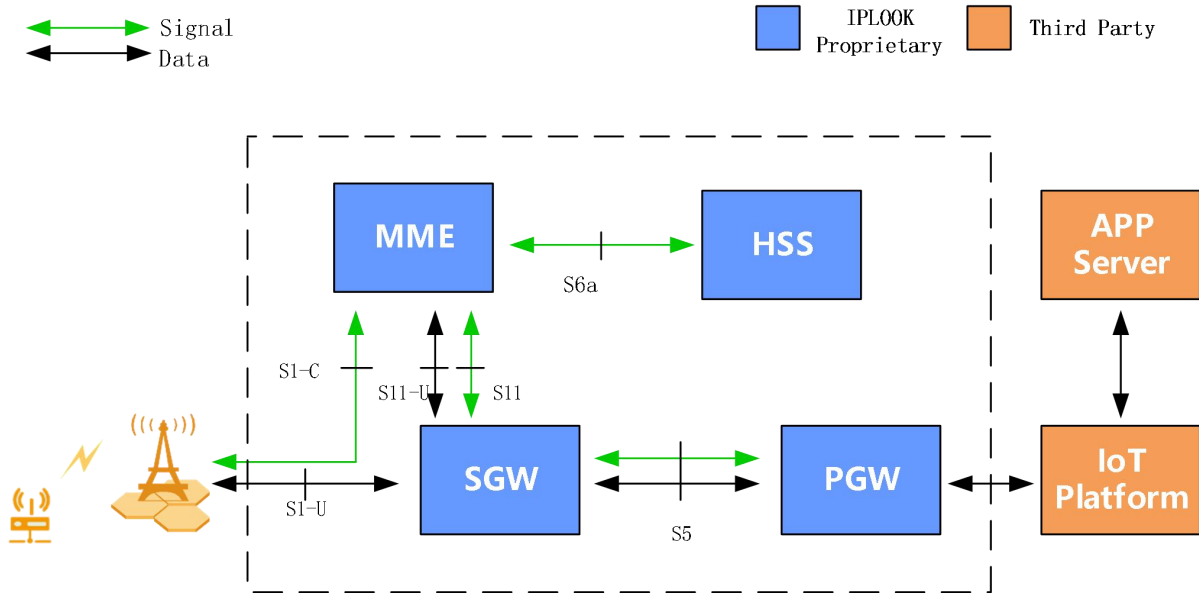


Figure 2.3-1

2.2 NB-IoT product strategy

2.2.1 Deployment strategy

- There are three deployment strategy provided by IPLOOK currently.

2.2.1.1 Compact Deployment

As is shown in the figure 2.3.1.1-2, Compact Deployment integrates almost all the network elements in one IPC(Industrial Personal Computer), including MME, SGW, PGW and HSS. The management and maintenance are much easier than traditional way.



Figure 2.4.1.1-2

2.2.1.2 Virtualized Deployment

As is shown in the figure 2.3.1.2-1, virtualized Deployment takes use of general x86 server as the platform. The function can be NFV element and deployed in the data center. Or, the network elements can be directly deployed on the X86 server to reduce the CAPEX. In Addition, IPLOOK could deploy all the network elements into one sever like compact Deployment, and could also deploy every different network elements into different severs, according to custom's personal needs.



Figure 2.4.1.2-1

2.2.1.3 Standard Carrier Grade Deployment

As is shown in the figure 2.4.1.3-1, Standard Carrier Grade EPC uses the ATCA chassis as the hardware platform. The MME/SGW/PGW/HSS can be stand-alone or integrated in one chassis according to the capacity requirement.



Figure 2.4.1.3-1

2.2.2 License strategy

- IPLOOK EPC license strategy is mainly based on the **Capacity** and **Throughput Rate** for data plant.
- There also some features need license.
 - a) MME Pool
 - b) Redundancy Function
 - c) Overload Control
 - d) 3GPP Call Trace
 - e) Throughput rate accelerate
 - f) APN correction function
 - g) SGW/PGW selection with load balance function

2.3 Technological support for customers

2.3.1 Training

- Provide a three-day free training and technical consulting for customer after system have been completed, to ensure related person can use this system correctly. Main courses of training are as follow:

- a) Business process understanding of industry and enterprise, and information training.
- b) Technical training of system hardware device operation specification
- c) System software program installing, operation, and system software upgrading training
- d) System simple maintenance training
- e) System fault location and solving method of faults training.

2.3.2 Guarantee and service commitment

- Quality assurance:

The products that we have produced and sold are designed and built under industry standard. All products have eligibility card, warranty card.

They are all new, original and accepted products.

- The warranty period: ONE YEAR.

During the warranty period, IPLOOK provides free maintenance for software or hardware provided by IPLOOK, in case the products suffer from a failure. (The failure is caused by non-human factors). Software is freely upgraded on site and the hardware can be return to the factory for maintenance service. The resulting costs are free.

After the warranty period, IPLOOK provides free technical support for system upgrading and equipment comprehensive maintenance. The other services are as same as warranty period except that the transportation expenses fee will be charged.

- Upgrade: software upgrades are free, hardware upgrades will take a discount.
- Operation and maintenance scheme

Resident maintenance: IPLOOK staffs will be arranged to real-time monitoring in 24 hours. They are in charge of resident maintenance, upgrading software and hardware, and take charge of connecting and debugging other products.

Remote maintenance: IPLOOK will provide remote monitoring, remote maintenance and debugging for communication products.

- Fault handling and response time

During the warranty, if the product failure, IPLOOK will take a response within 1 hour after receiving the customer's repair record and arrive to site within 12 hours. IPLOOK ensure the repair will be completed within 48 hours.

If special condition occurs and it cannot be repaired, IPLOOK will provide alternative equipment in the following 2 working day until the user equipment are back to service.

During the warranty, if the equipment is still in abnormal state after repairment, we will provide the replacement of new equipment with no charge.

2.4 The Feature lists

2.4.1 Terminals Power Saving Management

- Extended periodic timer
- PSM mode
- NB-IoT eDRX parameter

2.4.2 Data Transmission Optimization

- CP-CIoT for Control Plane Optimization
- UP-CIoT for User Plane Optimization
- Non- IP transmission

2.4.3 Recommended Cells and eNBs for Paging to Enhance Coverage Level

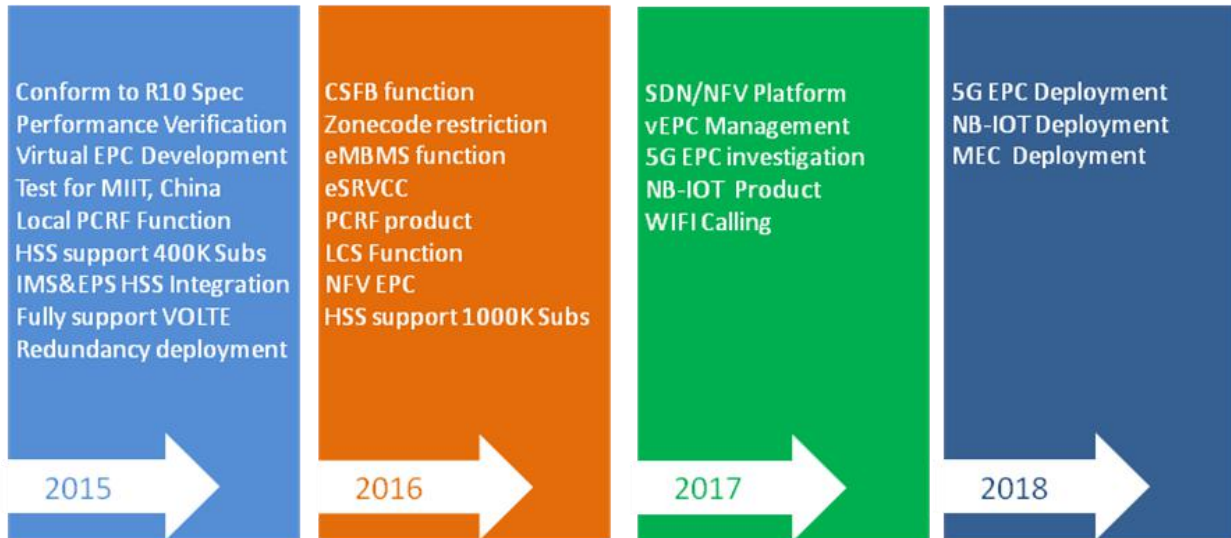
2.4.4 Overload control

- Signaling block control based on UE Back-off Timer
- APN block control based on PGW Back-off Timer

2.4.5 Rate Control

- Terminals' access rate control based on APN
- Terminals' access rate control based on PLMN

2.5 IPLOOK's EPC roadmap



IPLOOK EPC Roadmap

Figure 2.5-1