

The logo for IPLOOK, featuring the letters 'IP' in a white square followed by 'LOOK' in a bold, blue, sans-serif font.

IPLOOK

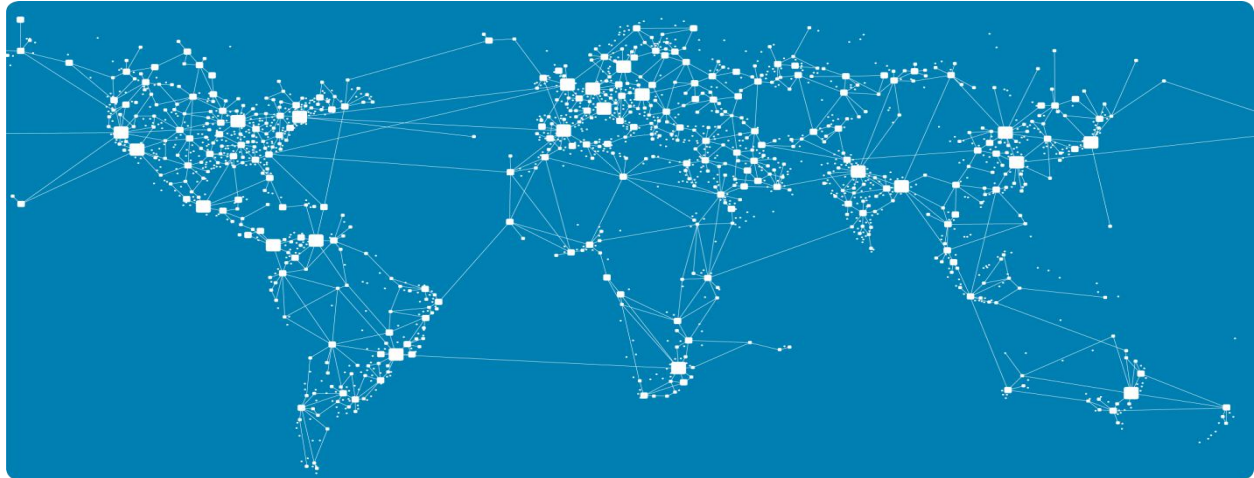
IPLOOK IMS PRODUCT INFORMATION

IPLOOK Technologies

www.iplook.com



IPLOOK IMS Product Information



IPLOOK Technologies / IPLOOK Technologies Co., Limited

Date (2020-02-01)

Document Version (V1.3)

Table of Contents

1 Overview & Introduction.....	3
2 Feature List.....	4
3 Functional Description.....	6
4 Product Strategy.....	错误！未定义书签。
5 Hardware Configuration.....	8
5.1 KMIMS150.....	9
5.2 IKIMS200.....	11
5.3 IKIMS300.....	13
6 Redundancy Backup.....	14
7 Roadmap.....	16
8 Technical Support.....	16

1 Overview & Introduction

IPLOOK IMS product overview is described in the following picture:

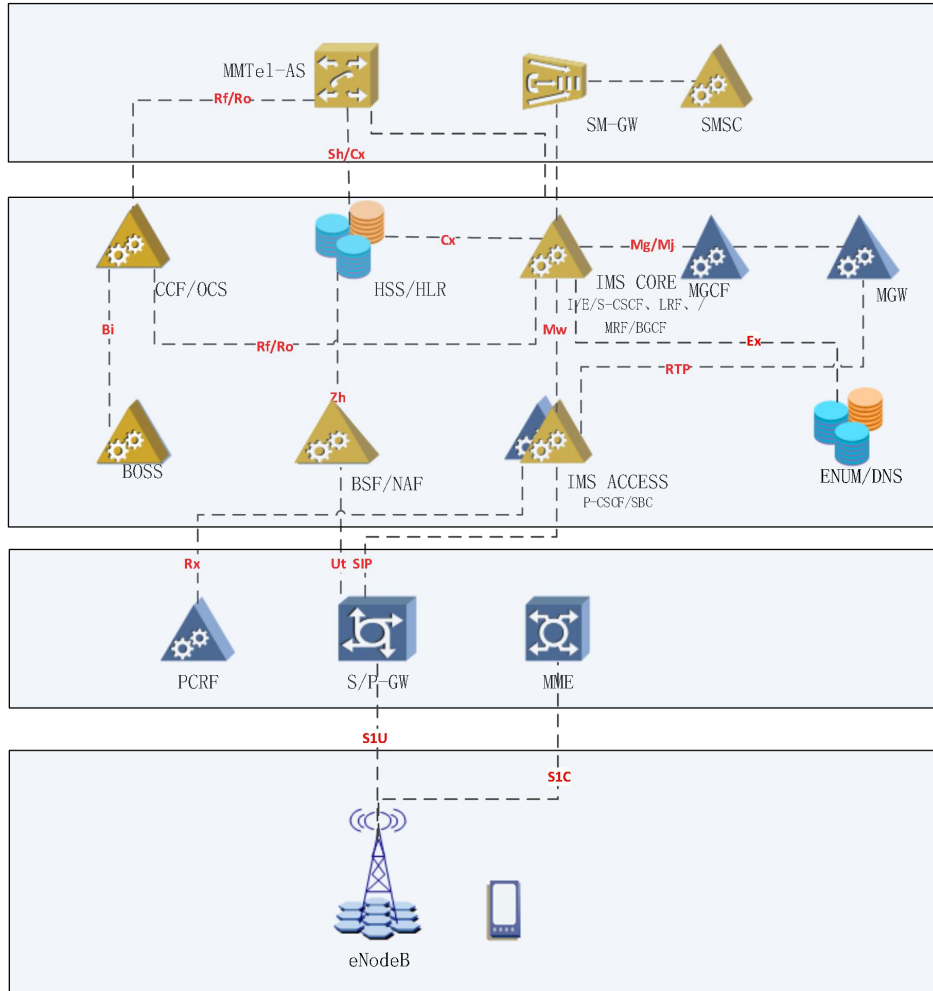


Figure 1 : IPLOOK IMS Product

IMS (IP Multimedia Subsystem) is a new mobile network infrastructure, a new way to deliver multimedia (voice, video, data, etc.) which can meet the requirements of multimedia services under the LTE system, especially VoLTE service.

Since IMS networks is separated with the core network, it can be quickly deployed. The core network (core layer) implements identity authentication for IMS users, controls sessions, manages roaming mobility, controls bearer plane QoS and media resources, and realizes interconnection and interworking. The service layer is composed of various application servers and resource servers, providing various services (such as traditional voice, games, meetings, and instant messaging) and service functions (such as groups and media resources).

IPLOOK's IMS system is based on the 3GPP protocol and RFC standard, and using OpenStack for development. The product meets the VoLTE service function of the operator's LTE network and can also cooperate with the dedicated EPC as a multimedia service function under the dedicated network. IMS products has multiple functions, such as user authentication, session control and routing, service triggering, and network interworking.

2 Feature List

IPLOOK IMS products have supported the following features:

1. Voice call with VoLTE or VoIP
2. Video call with VoLTE or VoIP
3. Interaction Call between LTE and PSTN or 2/3G CS through E1/T1 connections
4. Interaction between IMS networks
5. Instant Messaging
6. Billing event generation for Prepaid or Postpaid for charging
7. Support IPsec ESP for signaling transport

8. Support AKAv1/AKAv2/Http Digest/SIP Digest authentication
9. Supplementary service:
 - Calling line Identification Presentation
 - Calling Line Identification Restriction
 - Call Forwarding Unconditional
 - Call Forwarding on Mobile Subscriber Busy
 - Call Forwarding on No Reply
 - Call Forwarding on Mobile Subscriber Not Reachable
 - Call Wait
 - Call Hold
 - Operator Determined Barring
10. 3rd party call
11. Fax T.38 service
12. Work with RCS to support Presence information
13. Interaction with SMC&SMGW to support SMS service
14. IPLOOK IMS products have supported the following interfaces:
 - Rx interface between PCRF and P-CSCF for QoS control.
 - ENUM interface between S-CSCF and ENUM-DNS server for Tel URI to SIP URI conversion.
 - Sh interface between AS and HSS – used for IMS user profile management
 - ISC interface between AS and CSCFs – standard IMS interfaces
 - Gm interface between SBC/P-CSCF and UE (via EPC/PGW)
 - Cx/Dx interface between CSCF and HSS
 - Mg/Mj interface between CSCF and MGCF for PSTN-IMS interconnect

- SNMP interface towards Network Management System
- Ro interface between CSCFs and IN/OCS – used for pre-paid service charging
- Rf interface between CSCFs and CCF – used for post-paid service charging

3 Functional Description

1. SBC network element

Session signaling control function:

- Real-time SIP session control.
- Integration with multiple application servers.
- Provide authentication and registration services for users and conversational services.
- Access is irrelevant.
- Conversation media control function:
 - Quality of Service: Support IP Services Classification Protocol (ToS).
 - Codec conversion function, support AMR, AMR-WB, G.711 G.729, etc.
 - Voice function: silence suppression, voice activity detection (VAD), comfort noise generation (CNG), packet loss compensation (PLC), etc.

2. IPLOOK S-CSCF network element supports the following main functions:

- To handle registration requests by acting as a registrar as defined in [RFC3261].
- To authenticate users by means of the IMS Authentication and Key Agreement (AKA) schema.
- To download user information and service profile from the HSS during registration or when handling a request to an unregistered user.

- To route mobile-terminating traffic to the P-CSCF and to route mobile originated traffic to the I-CSCF, the Breakout Gateway Control Function (BGCF) or the application server (AS).
 - S-CSCF Enhanced iFC Handling
 - To interact with RCS
 - Sending of SIP OPTIONS for remote peer availability
 - To translate an E.164 number to a SIP universal resource identifier (URI) using a domain name system (DNS) translation mechanism
 - To send accounting-related information to the CCF for offline charging purposes and to the Online Charging System
3. IPLOOK BGCF network element supports the following main functions:
- With integrated BGCF, processes requests for routing from an S-CSCF when the S-CSCF has determined that the session cannot be routed using DNS or ENUM/DNS.
 - Processes the interworking with the PSTN/CS Domain, when the BGCF has determined that a breakout should occur in the same IMS network to send SIP message from BGCF to MGCF.
4. IPLOOK I-CSCF network element supports the following main functions:
- To allow detection of an INVITE request addressed to a special address, triggering the Cx LIR query to use the IMPU from the P-Asserted-Identity header.
 - To modify the Request-URI type, e.g. from TEL URI or SIP URI to SIP URI with user=phone.
 - First Point of Entry (From P-CSCF in home network or from P-CSCF in visited network)
 - S-CSCF Assignment by selection based on assignment in HSS
5. IPLOOK P-CSCF/SBC network element support the following main functions:

- 3GPP R10 compliant Proxy-CSCF (P-CSCF) function
- Support for Gm, Mw, Rx, Rf/Ro interfaces
- Voice Quality Enhancements (VQE)
- Security support, IPsec for SIP, etc.

6. MGCF/MGW network element

Its main functions include:

- Support Mj/Mg interface, support E1/T1 interface.
- Support the conversion of signaling SIP to ISUP/BICC; support RTP stream IP transmission.
- Speech coding support: AMR, AMR-WB, G.711 G.729, etc.

7. MMTEL-AS network element

Its main functions include:

- Support ISC, Sh, Ro/Rf interface
- Support VoLTE basic business voice, video call control, etc.
- Support call control for supplementary services, such as call transfer, call waiting, call holding, etc.

8. MRF network element

The main supported functions include:

- Support the prompt tone service related to call failure.
- Support calling basic ring back tone service.

4 Product Description

IPLOOK currently has two main products: IKIMS150 and IKIMS200.

4.1 IKIMS150

IKIMS150 is a all-in-one product, including:

PCSCF/SBC/ICSCF/SCSCF/LRF/ECSCF/VoLTE-AS/MRF/BGCF, and BSF/NAF/XCAP-Server network elements.

Recommended Hardware Configuration:

Processor	CPU	Intel Xeon Silver 4110
	CPU sequence	2.10 GHz
	Quantities of CPU	2
Memory	Memory type	DDR4
	Capacities	32GB
Storage	Drives type	SATA/SAS
	Standard Drives Capacities	1.2TB
	RAID mode	RAID 1
Network	NIC	4 x 1GbE
Management	System Management	OpenManage Essential Controller
		iDRAC8 Port
		iDRAC Direct
		iDRAC Quik Sync
		OpenManage Mobile

1. P-CSCF/SBC

Modules	Value
Support 3GPP standard NE	P-CSCF/SBC
Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes
Security requirements	Signaling and media encryption
The number of registered users	Maximum: not less than 50,000

The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 1,000
Calling delay	Less than 1s
The probability of successful calling	Not less than 99%

2. I-CSCF/S-CSCF/BGCF

IMS Core Network module indicator	Value
Support 3GPP standard NE	I-CSCF/S-CSCF/BGCF
Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes
Security requirements	Signaling and media encryption
The number of registered users	Maximum: not less than 50,000
The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 1,000
Calling delay	Less than 1s

3. MGCF/MGW

PSTN/CS Relay gateway Indicator	Value
Support 3GPP standard NE	MGCF/MGW
Equipment hardware requirements	General X86 Server with Linux system
E1/T1 Interface	4 - 24
Signaling conversion	Between SIP and SS7 ISUP, SIGTRAN M3UA PRI
Voice encoding format	AMR-NB, AMR-WB*, G.711, G.722, G.723.1, G.726, G.729 A/B, GSM-FR, GSM-EFR, iLBC
Video encoding format	H.263, H.264, MPEG-4
Supporting Noise cancelling	Yes
Quantity of VOIP tunnel	Not less than 1,000
Calling Delay	less than 1s
Probability of Successful calling	Not less than 99.9999%

4. AS/MRF

Application Server Indicator	Value
3GPP standard NE	AS/MRF
Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes

The number of registered users	Maximum: not less than 50,000
The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 1,000
Calling delay	Less than 1s
Probability of Successful calling	Not less than 99.9999%

4.2 IKIMS200

IKIMS200 is a standard product (**with three servers**):

- standard IMS product, including PCSCF/SBC in one server.
- ICSCF/ECSCF/LRF/BSF/NAF/XCAP in one server.
- SCSCF/VoLTE-AS/MRF/BGCF in one server.

Recommended Hardware Configuration:

Processor	CPU	Intel Xeon Silver 4114
	Quantities of CPU	2
Memory	Memory type	DDR4
	Capacities	32GB
Storage	Drives type	SATA/SAS
	Standard Drives Capacities	1.2TB
	RAID mode	RAID 1
Network	NIC	4 x 1GbE
Management	System Management	OpenManage Essential Controller
		iDRAC8 Port
		iDRAC Direct
		iDRAC Quik Sync
		OpenManage Mobile

1. P-CSCF/SBC

Modules	Value
Support 3GPP standard NE	P-CSCF/SBC
Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes
Security requirements	Signaling and media encryption

The number of registered users	Maximum: not less than 200,000
The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 4,000
Calling delay	Less than 1s
The probability of successful calling	Not less than 99%

2. I-CSCF/S-CSCF/BGCF

IMS Core Network module indicator	Value
Support 3GPP standard NE	I-CSCF/S-CSCF/BGCF
Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes
Security requirements	Signaling and media encryption
The number of registered users	Maximum: not less than 200,000
The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 4,000
Calling delay	Less than 1s

3. MGCF/MGW

PSTN/CS Relay gateway Indicator	Value
Support 3GPP standard NE	MGCF/MGW
Equipment hardware requirements	General X86 Server with Linux system
E1/T1 Interface	4 - 24
Signaling conversion	Between SIP and SS7 ISUP, SIGTRAN M3UA PRI
Voice encoding format	AMR-NB, AMR-WB*, G.711, G.722, G.723.1, G.726, G.729 A/B, GSM-FR, GSM-EFR, iLBC
Video encoding format	H.263, H.264, MPEG-4
Supporting Noise cancelling	Yes
Quantity of VOIP tunnel	Not less than 4,000
Calling Delay	less than 1s
Probability of Successful calling	Not less than 99.9999%

4. AS/MRF

Application Server Indicator	Value
3GPP standard NE	AS/MRF

Equipment hardware requirements	General X86 Server with Linux system
Virtualized deployment	Yes
The number of registered users	Maximum: not less than 200,000
The Probability of message loss	$P \leq 10^{-7}$
The number of concurrent signaling per second	Not less than 4,000
Calling delay	Less than 1s
Probability of Successful calling	Not less than 99.9999%

4.3 IKIMS300

IKIMS300 is a customized solution provided by IPLOOK for one of our customers: According to capacity support requirements (150w registered users) and two places remote redundancy deployment requirements; the deployment list of each network element is as follows:

Network Element	Quantities	Description	Quantities
MMTel-AS/S-CSCF	4	Six sets of equipment, three set on each place	6
I-CSCF/BGCF/BSF/NAF E-CSCF/LRF/MRF	2	Two sets of equipment, each set for each place	2
P-CSCF/SBC	10	Ten sets of equipment, five set for each place	10
Database/OMC/ENUM/DNS	2	Two sets of equipment, each set for each place	2

SM-GW/SMSC	2	Two sets of equipment, each set for each place	2
------------	---	--	---

Hardware Configuration in this case:

- CPU: Inter Xeon E5-2650
- Memory: 32G
- Hard disk: 500G
- Ethernet port: 4 x 1GbE

5 Redundancy Backup

Network Elements	Disaster recovery networking mode
P-CSCF/SBC	POOL mode
MMTel-AS/S-CSCF	POOL mode
I-CSCF/BGCF/BSF/NAF E-CSCF/LRF/MRF	One Main Server + One Backup Server

Database Server/OMC/ENUM/DNS	One Main Server + One Backup Server
SM-GW/SMSC	One Main Server + One Backup Server

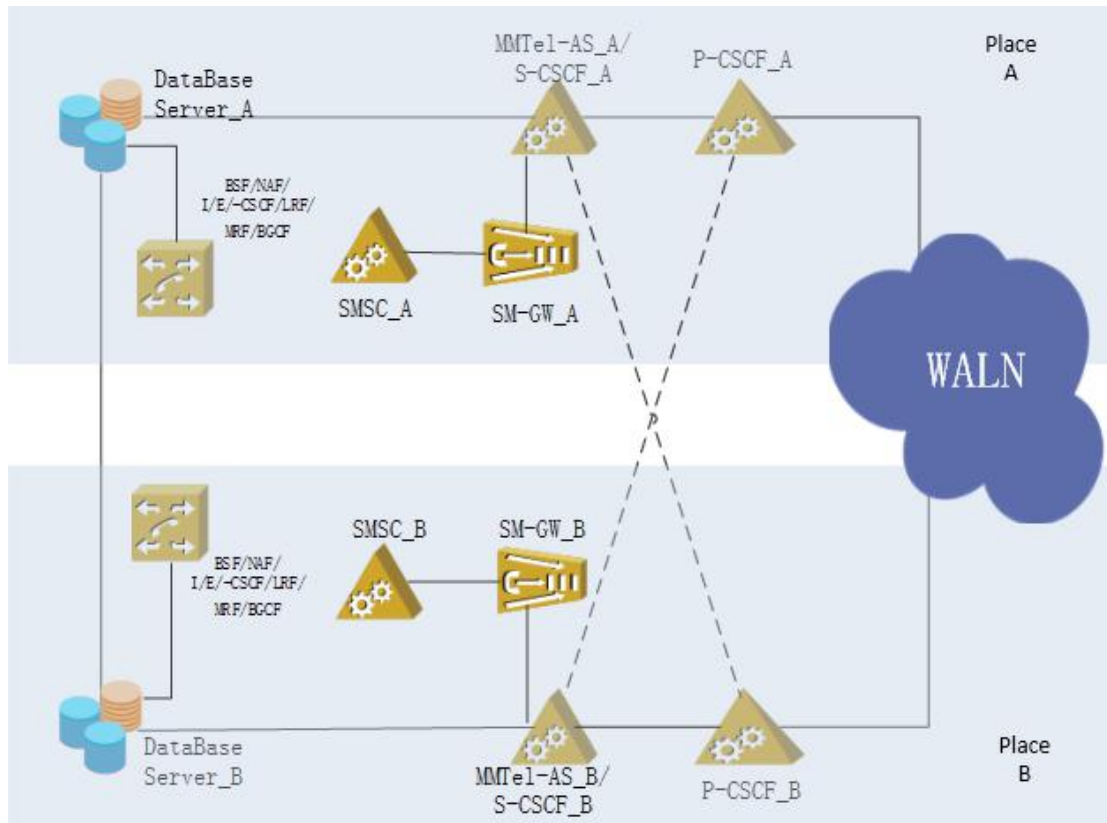


Figure 4: Remote Parallel Compensation

The picture shows the IMS remote dual Active system provided by IPLOOK. That is, a set of IPLOOK IMS systems are deployed in A and B, and each undertakes local business. When any one of the network elements fails, the service can be automatically switched to another normal network element in a remote location to achieve disaster tolerance.

6 Roadmap

IPLOOK IMS Roadmap is shown as below figure.

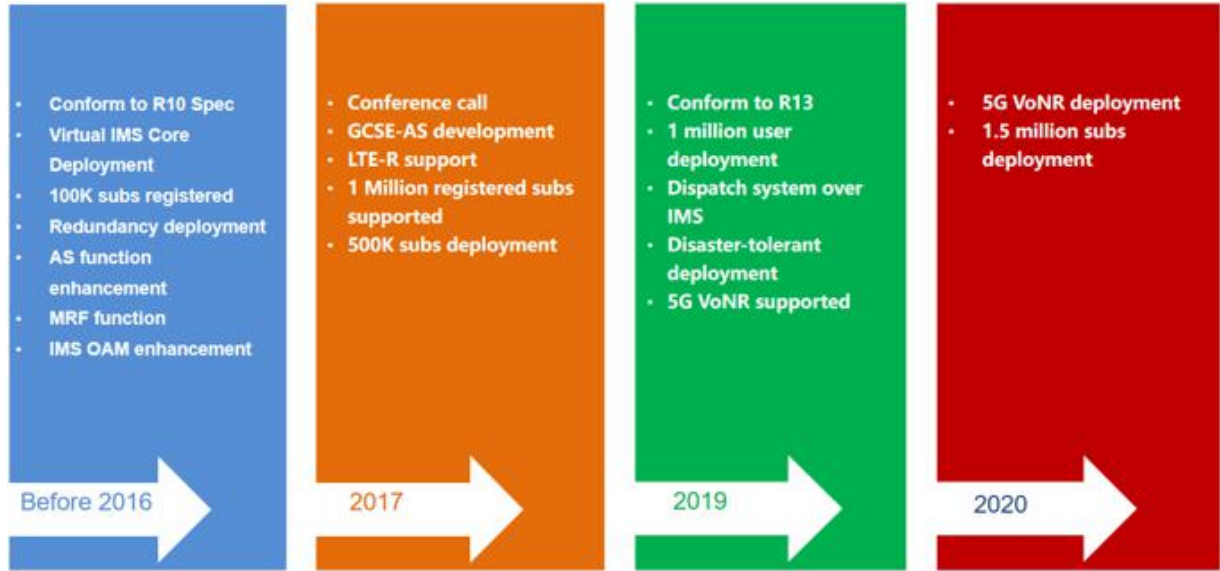


Figure 5: IPLOOK IMS Roadmap

7 Technical Support

IPLOOK Product Support Services offers CT foundation service that perform continuous and reliable maintenance services based on the Service Level Agreements (SLAs) you choose.

IPLOOK CT Foundation Service provide flexible service offering portfolio, which include Onsite service to help you maintain a more efficient and stable network environment and improve network productivity, and the Basic Service is provided as collaborative solution for your maintenance team or certified IPLOOK partners, to support them maintain a more efficient and stable network environment and improve network productivity.

The following table shows IPLOOK CT Foundation service coverage:

IPLOOK Technologies Co., Limited
 Suite 1101, On Hong Commercial Building, 145 Hennessy Road, Wanchai Hong Kong

Service offerings	IPLOOK CT Foundation Service			
	Basic Service		Onsite Service	
	9x5xNBD	24x7x4	9x5xNBD	24x7x4
Technical Support Center (TSC) support (E-mail & Hotline)	24x7	24x7	24x7	24x7
Onsite Support	/	/	9x5xNBD	24x7x4 Hour - Arrive
Software Support	YES	YES	YES	YES

Notes:

1. The SLA in this document is for reference only. Service contents and response time may vary by country. For detailed information, please contact an IPLOOK authorized partner or your local IPLOOK sales and service representative.
2. Service delivery is based on commercially reasonable efforts. IPLOOK will select a proper service mode based on the actual situation and the committed SLA to resolve your problems in a timely and effective manner.
3. 24x7x4: Priority 1 calls, four-hour response available 24x7; Priority 2 Next Day, Priority 3 calls, Next Business Day.

4. The service start date and end date should be specified in the respective Purchase Order or contract between you and IPLOOK. If no service start date is listed on the PO/contract, it is defined as below.
 - 1) For a new service order sold together with IPLOOK product, the service starts on the 90th day after the product shipment date from IPLOOK.
 - 2) For a renewal service order, the service start date is the day after the end date of warranty or the previous Service.