



```
modifier_ob.modifiers.new("MIRROR_X")
mirror_ob.mirror_object = mirror_ob

operation == "MIRROR_X":
    mirror_mod.use_x = True
    mirror_mod.use_y = False
    mirror_mod.use_z = False
operation == "MIRROR_Y":
    mirror_mod.use_x = False
    mirror_mod.use_y = True
    mirror_mod.use_z = False
operation == "MIRROR_Z":
    mirror_mod.use_x = False
    mirror_mod.use_y = False
    mirror_mod.use_z = True

Selection at the end -add back the deselected objects
mirror_ob.select= 1
mirror_ob.select=1
 bpy.context.scene.objects.active = mirror_ob
 bpy.context.selected_objects[0].name = str(mirror_ob) # mirror object
 mirror_ob.select = 0
 bpy.context.selected_objects[0]
 bpy.context.selected_objects[one.name].select = 1

print("please select exactly two objects, we will create a mirror")

OPERATION = "MIRROR_X"

def mirror_ob(modifier_ob):
    """Create a mirror to the selected object"""
    mirror_ob = bpy.context.selected_objects[0]
    mirror_ob.name = "Mirror_X"
```

# IPLOOK Technologies Co., Ltd

2020.08

**01** **Company profile**

**02** **Product lines**

**03** **Solutions**

**04** **Advantages**





# 01

## Company profile



# Brief Introduction

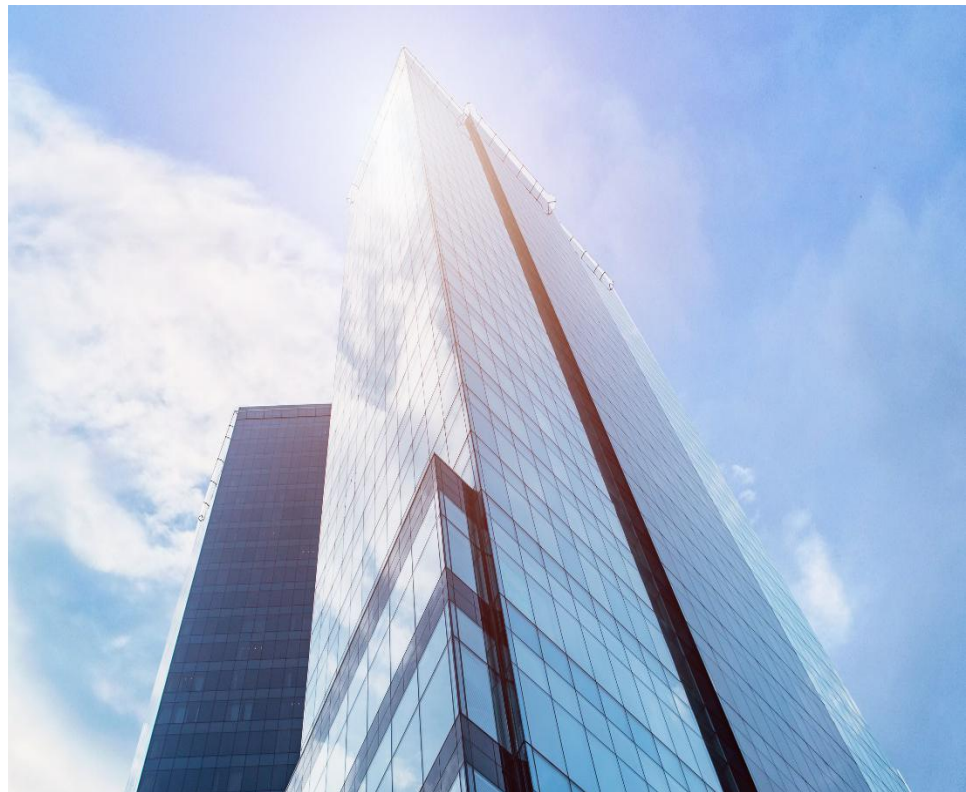
- Over 8 years, IPLOOK has accumulated commercial experiences of telecommunication industry with 3G/4G/5G/IMS core network
- 80+ employees with over 80% are R&D or technical support engineers
- Field-proven products in China, South-east Asia, Africa, Middle East, West Europe etc.
- Standard and High availability 3G/4G/5G products and customized services for : MVNO, WISP, MNO, Private Networks

2012

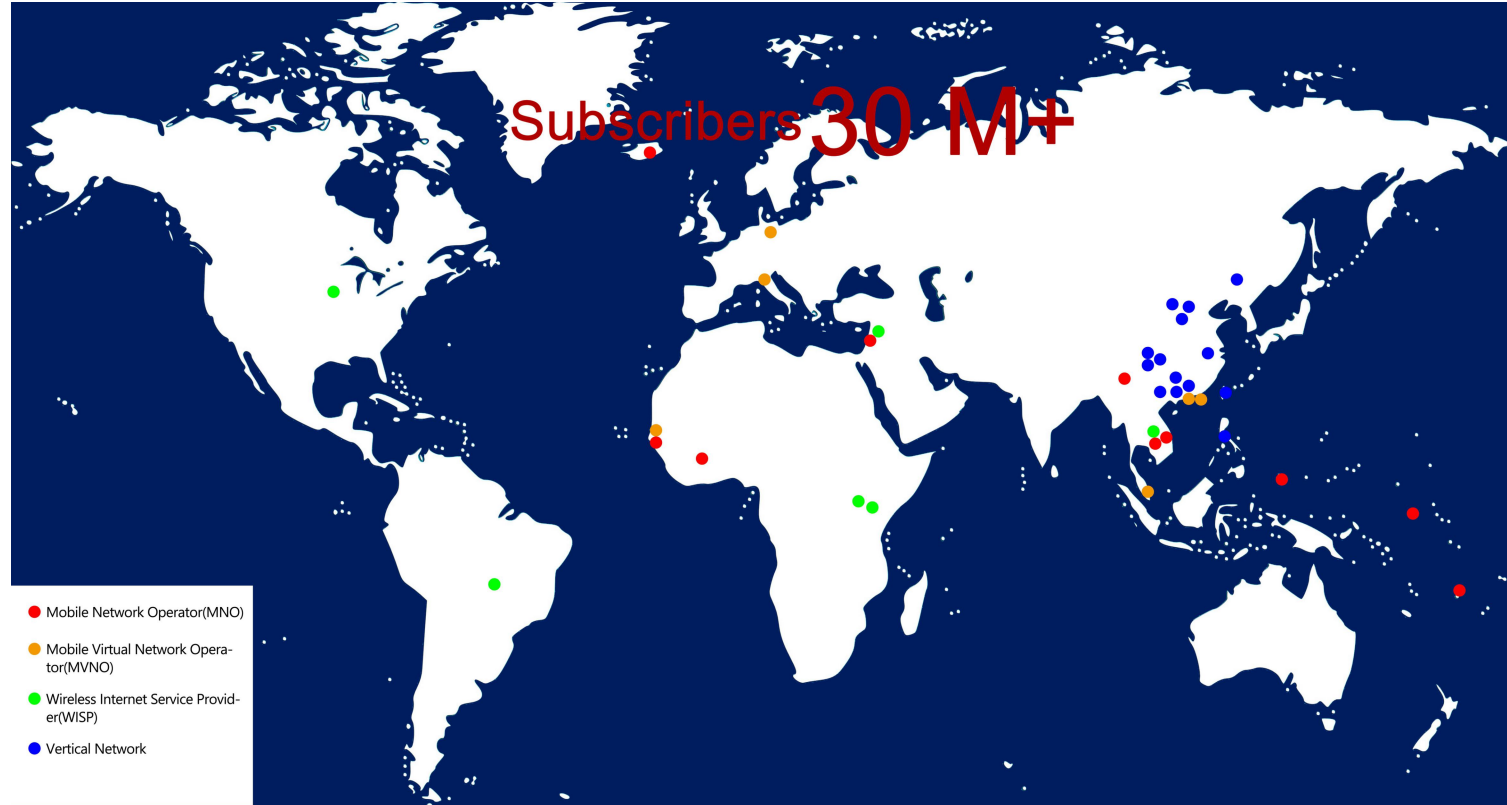
80+

30+

35+



# Global Network





# 02

## Product lines

## 3G Core

NFV deployment

HLR/GGSN/STP/SMS/  
USSD

- ▶ Support X86 servers or cloud
- ▶ High Availability, Easy scaling
- ▶ Good interoperability with other vendor

## 4G Core

NFV deployment

MME/HSS/SGW/PGW/  
PCRF/DRA

- ▶ Support X86 servers or cloud
- ▶ High Availability, Easy scaling
- ▶ Good interoperability with other vendor

## 5G Core

NFV deployment

AMF/UDM(AUSF)/UPF/SMF  
/PCF/NRF/NSSF etc

- ▶ Support X86 servers or cloud
- ▶ High Availability, Easy scaling
- ▶ Good interoperability with other vendor
- ▶ Support 3G/4G/5G convergent core network

# Product lines

## M2M

For Smart cities, like  
metering, sharing bicycle,  
Asset's  
location etc.

- ▶ Support X86 servers or cloud
- ▶ High Availability, Easy scaling
- ▶ Good interoperability with other vendor
- ▶ With C-SGN(enhanced MME, SGW, PGW), NB-IoT and eMTC features are supported

## IMS

NFV deployment

AS, I/S/P-CSCF, BGCF,  
SBC/MGW, MCPTT,  
Dispatch system

- ▶ Support X86 servers or cloud
- ▶ High Availability, Easy scaling
- ▶ VoNR functions supported

## MCPTT

NFV deployment

Setup over IMS

- ▶ Support X86 servers or cloud
- ▶ Convergent dispatch functions with VoLTE, fixed voice, VoIP and VoNR being supported





# 03

## Solutions

# Solutions 1 (Available)

## Solution for WISP

Fixed wireless access over LTE for data service instead of FTTX, LAN or ADSL.

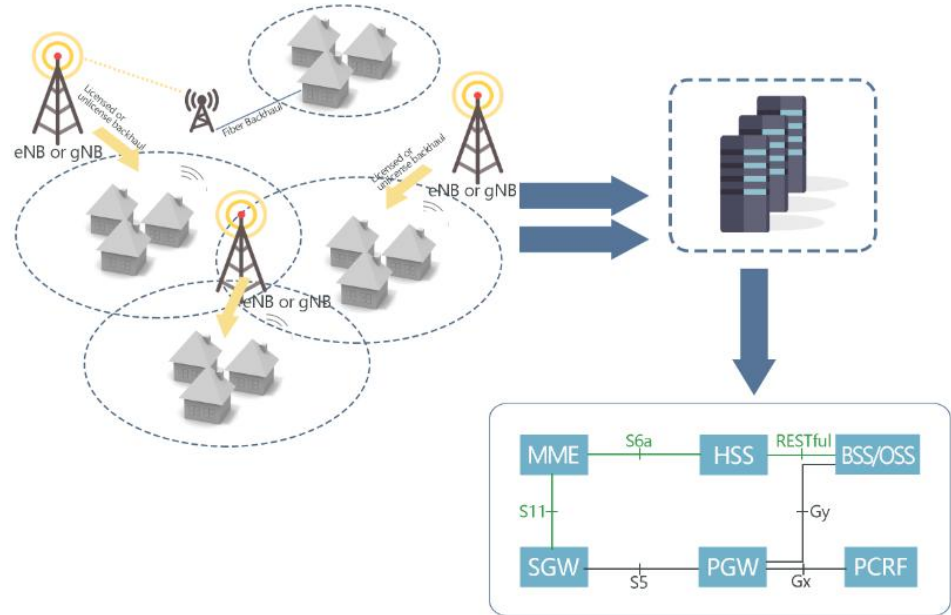
### Application scenario:

Remote country; Home internet services

### Advantages:

Multi-vendor's eNodeBs supported

Multi charging mode: RADIUS, OCS, CG



# Solutions 2 (Available)

## Solution for MVNO

IPLOOK enables MVNOs to become **Light MVNO**(with HSS/HLR,BOSS), **Full MVNO**(with more like, STP, DRA, GTP- Router, PGW/GGSN, PCRF, SMSC/USSD) and **MOCN operator**(with more like MME, SGW, SGSN, MSC, GMSC) .

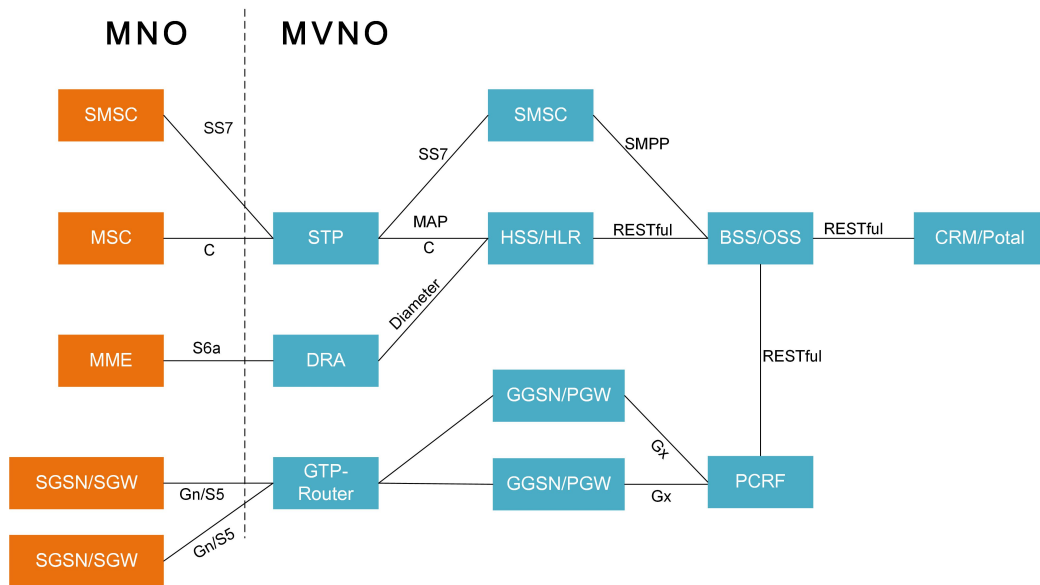
### Application scenario:

International roaming for tourists & M2M

### Advantages:

Field-proven proposal for MVNO

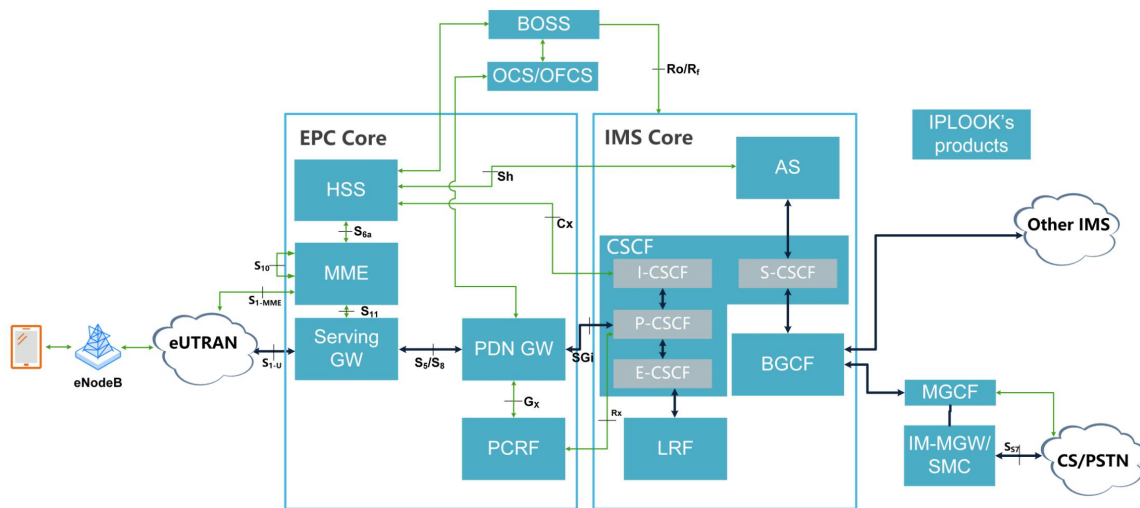
Lower CAPEX & OPEX



# Solutions 3 (Available)

## Solution for MNO

- Replace existing 2G&3G sites by 4G sites.
- Upgrade the traditional 2G&3G core network to NFV core network.
- Upgrade the OSS/BSS to new system with OCS.
- The new core network is 5G ready platform. It would be upgrade to support 5G NR smoothly.



# Solutions 4 (Available)

## Solution for Private Networks

### Application scenario:

Private network for mines communication, police communication, power grid etc.

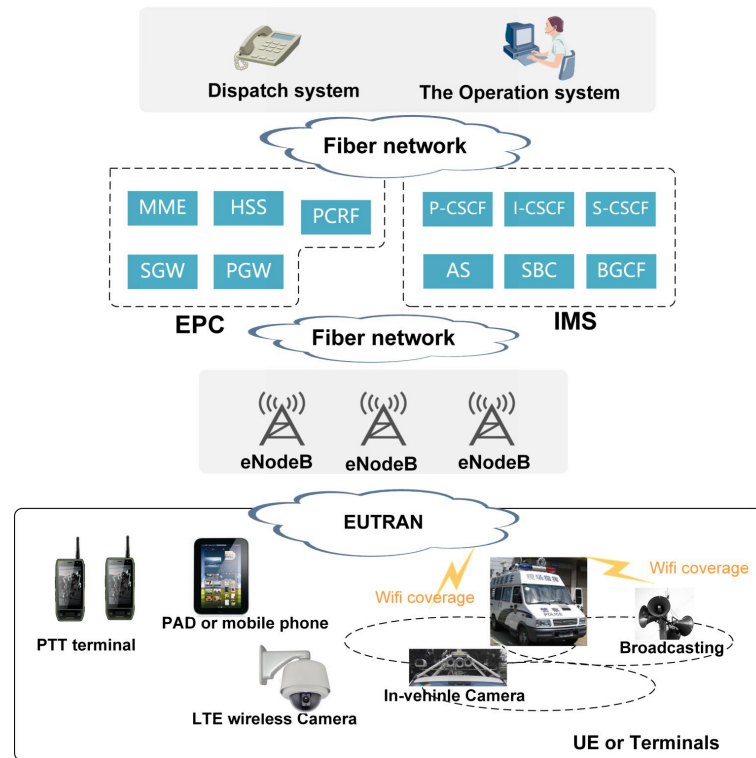
### Services:

Data, VoLTE, VoNR, MCPTT, SMS

### Advantages:

Rich industrial network experiences

Better customization capability





# Solutions 5 (Available)

## Solution for IoT

### Application scenario:

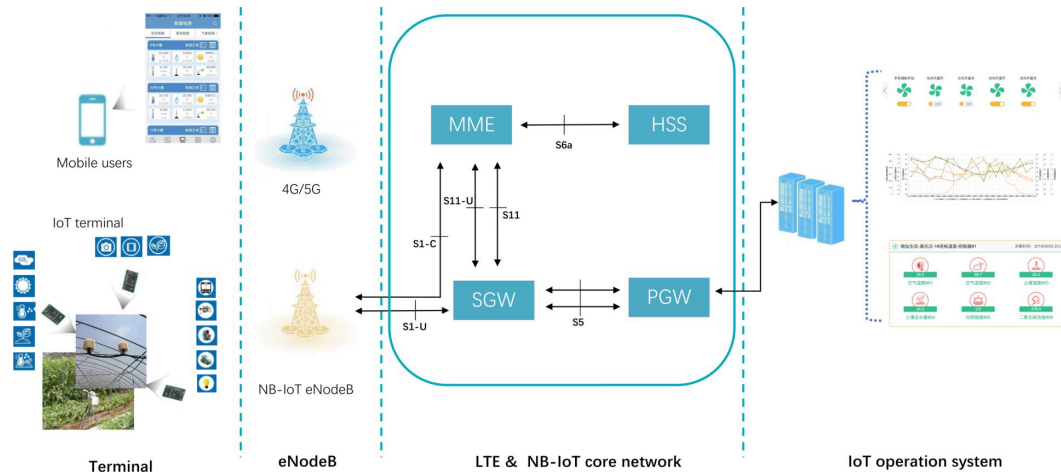
The IoT core for both operator and private networks. With the solution, the IoT terminals or sensors can be some power saving NB-IoT or eMTC devices.

### Services:

Small amount data transfer

### Advantages:

CAPEX-saving solution with lite eNB and core  
Convergent LTE and IoT core



# Solutions 6 (2020 Q4)

## Solution for 3G/4G/5G Convergent Network

### Application scenario:

For the operator with existing 3G or 4G network wants to build 5G, the solution 6 enables the operator to keep 3G or 4G wireless infrastructure, and cut the core network to the new 5G one. For operators using IPLOOK's 4G core, they can get a upgradation on software to acquire 5G capability.

### Services:

3G/4G/5G Data + VoLTE or VoNR

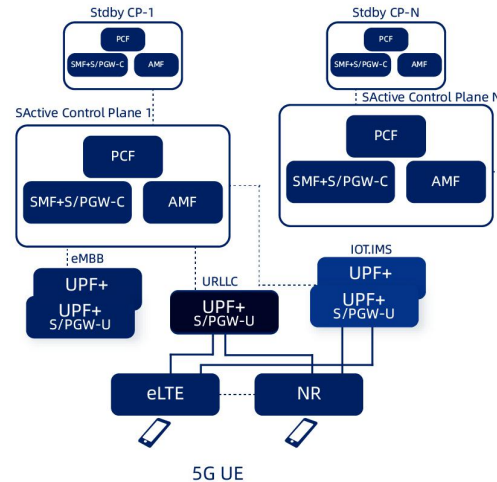
### Advantages:

Lower CAPEX & OPEX

Easy O&M

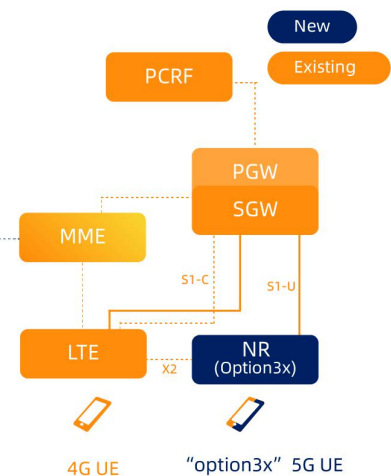
### 5G SA Core Network

Supports 5G SA UE's and 4G UE's



### 4G Core + 5G NSA NR

Option 3x UE Support





# 04

## Advantages

# Certificates

1. The 5th core network provider acquiring Internet access certificate in China
2. CMMI - 3 certificate
3. 80+ software copyrights
4. ISO 9001 qualification
5. 100+ patents in core network field



# Advantages



## Cases all over the world

IPLOOK has accumulated a serial of cases in the last 8 years. Its 3G/4G/5G core network conforms to 3GPP standard and could be easily integrated with existing network from third party.



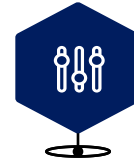
## The total core solution

It has 3G, 4G and 5G core network to ensure a smooth upgradation. At the same time, IPLOOK supports the eNodeB from multi-brands whose products are standard.



## Customized design

Customized services are provided to satisfy the requirements of Vertical networks or MVNOs.



## Save CAPEX & OPEX

With its NFV technology, IPLOOK's core network are all software. As a result, the flexibility and convenience of maintainance and deployment could be achieved to save CAPEX & OPEX.



# Roadmap

## Full Function

- SGW
- GGSN/PGW
- HSS/HLR
- MME
- PCRF
- IMS(VoLTE)
- DRA
- STP
- NB-IoT
- MEC

**Before 2019**

## 5GC Full Function

- UPF/UDM/AUSF/SMF /AMF
- HTTP2 GW
- Voice Dispatch System Over IMS

## 5GC Basic Function

- PCF
- UDR
- The IoT with NR
- NRF
- NEF
- NSSF

**2019**

## 5GC Full Function

- PCF
- UDR
- NRF
- NEF
- NSSF

## 5GC Basic Function

- SMSF
- SEPP

## 5GC NFV Architecture

- Cloud Native

**2020 Q2**

## 5GC Full Function

- SMSF
- SEPP
- VoNR

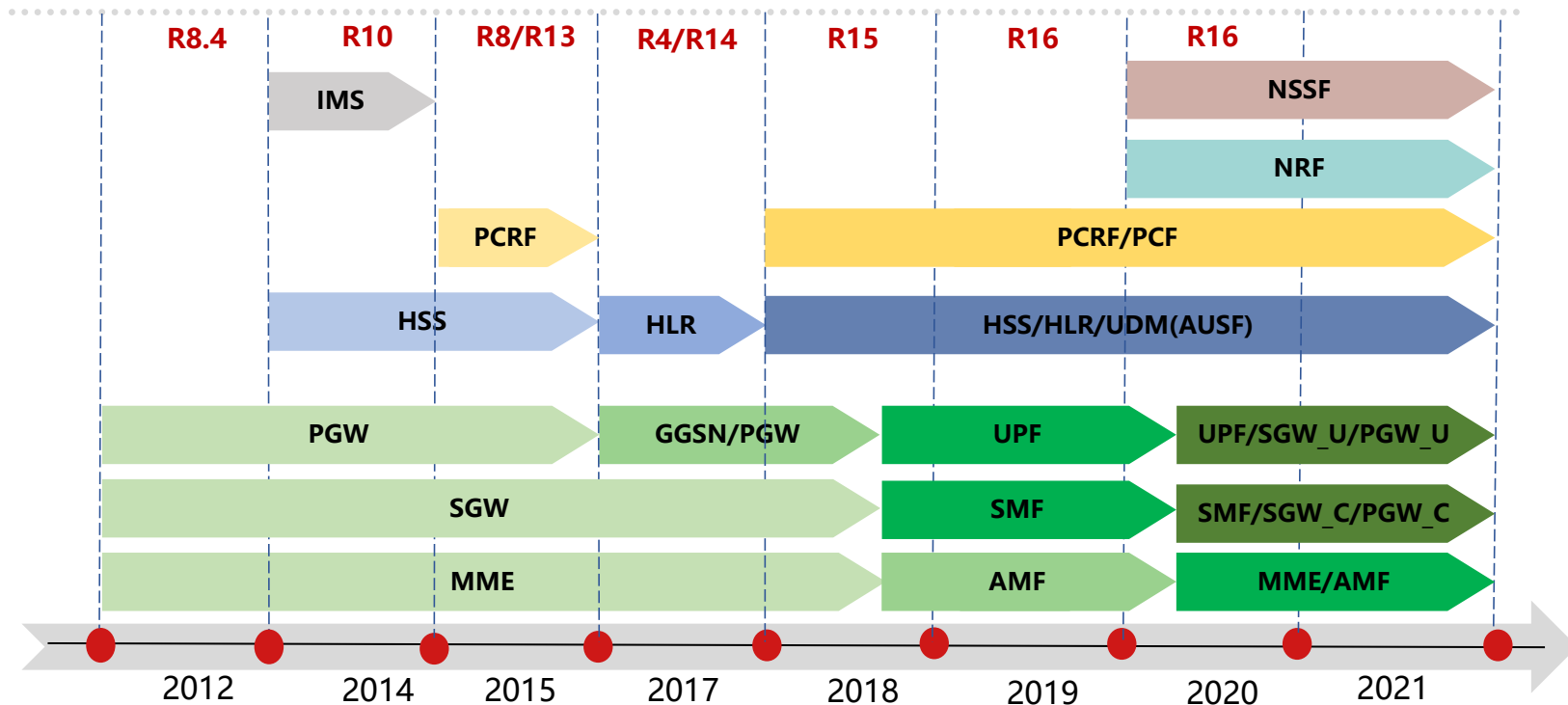
## 3G/4G/5G Core Network Convergence:

- HSS/HLR/UDM
- GGSN/PGW-U/UPF
- GGSN/PGW-C/SMF
- PCRF/PCF
- MME/AMF

**2020 Q4**

# Core Evolution

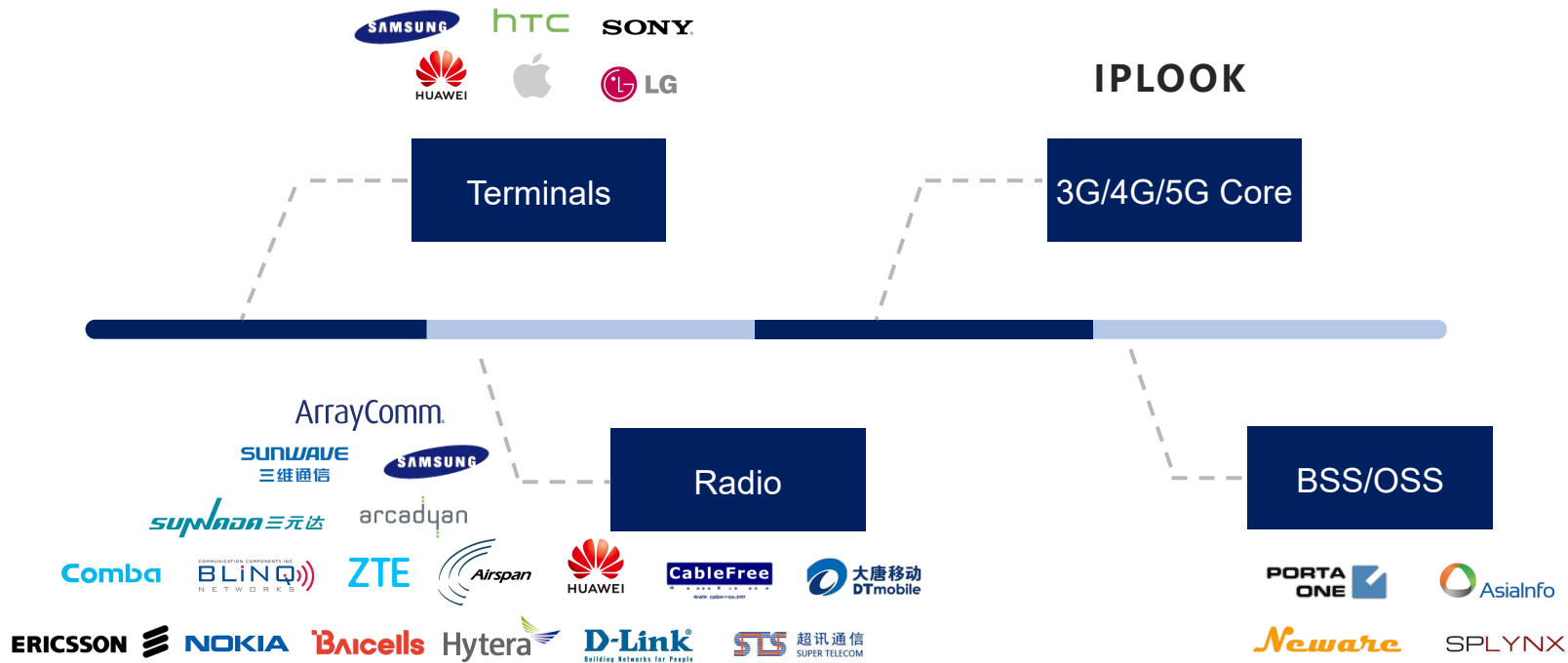
## 3GPP Release



# Clients & Partners



# Industry Cooperation



Region	Solutions	Subscribers
Hong Kong	MVNE solution with HSS/HLR, PGW/GGSN, PCRF, and GTP-Router	1M
	HSS/HLR for a MVNE	1M
Cambodia	EPC for a WISP	500K
Tokelau	LTE network for Islands	5K
Middle East	LTE coverage for 31 regions	1M
North-east of China	Vertical Networks for mining	30K
Italy	MVNO+Billing solution	500K
Netherlands	MVNO solution with HSS/HLR, PGW, SGW, MME, PCRF for a MVNO	100K
Philippines	EPC for a WISP	50K
Ghana	EPC+Billing	50K

## Reference



# THANK YOU



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