

kt powertel

IP-PTT Introduction

Contents

1 Introduction

2 What we offer

- IP-PTT platform 'Power-Talk 2.0'

- IP-PTT Terminal 'RADGER'

- IP-PTT Application 'RADGER PTT'

- RoIP gateway

- Easy-eye

3 Why 'kt powertel'?

1. Introduction



- Established
- Paid-in-Capital
- Revenue
- No. of Employee
- Subscribers

December 30, 1985
 USD 86 M
 USD 804 M
 142 Persons
 270 thousand

Business Scope

| LTE IP - PTT | Legacy PTT | Location Base Service | Internet of Thing |
|-----------------------|------------|-----------------------|-------------------|
| <p>Power-Talk 2.0</p> | | <p>Easy Eye</p> | <p>Control</p> |

1. Introduction

kt powertel is a leading company providing group communication service(PTT, push-to-talk) for 20 years in S.Korea. On 1st Oct. 2014, launching the first IP-PTT service named 'Power-Talk 2.0' and the dedicated terminal 'RADGER' in the world.

Platform
Development

IP-PTT Exchange
System 'Power-Talk 2.0'



* IP-PTT(IP-Push To Talk) : LTE PTT



Terminal
Development

IP-PTT Dedicated
Terminal 'RADGER'







The world's first LTE radio communication service and a dedicated terminal RADGER release.

- 2018 'RADGER T2', 'RADGER mini' and 'RADGER S' release
2018 PyeongChang Winter Olympics Communications Support
- 2017 'RADGER 3', 'RADGER IS' and 'RADGER Lite' release
- 2016 The Smartphone PTT application 'RADGER PTT' release
The LTE dedicated terminal 'RADGER F1' release
- 2015 The LTE dedicated terminal 'RADGER T1', 'RADGER 2' release
- 2014 Power-Talk 2.0(The world's first LTE radio communication service) and a LTE dedicated terminal 'RADGER 1' release
- 2013 Betroi(3G Radios) service release
- 2012 Nuclear Security Summit, Yeosu Expo Communications Support
DoubleV(TRS+3G/Smartphone) service release
- 2011 Daegu World Championships in Athletics Communications Support
- 2010 Korea Coast Guard to build integrated networks
- 2009 Duall(TRS+3G/Feature phone) service release
- 2006 GM Daewoo Korea to build integrated networks
- 2005 APEC KOREA communication support
- 2002 Corporate name changed; kt powertel
FIFA World Cup official vendor Selection&communication support
- 2000 Mobile telephone and data services, commercial services launched
ASEM International Conference on Communication Support
- 1997 Digital TRS commercial service launched
- 1985 Korea Port Phone Co., Ltd. established

1. Introduction

Utilize for national public-safety & business communication in a variety of fields.

| Public | Manufacturing | Company | Service/Security |
|--|--|---|--|
|  |  |  |  |
| <ul style="list-style-type: none"> · National Maritime · Police Agency | <p>Samsung Group (electronic, display)</p> | <p>Lotte Group (building, department)</p> | <ul style="list-style-type: none"> · Jeju airline · kt telecop |
| <p>Dispatch between Control tower & field</p> | <p>Product line Management Distribution, transportation</p> | <p>Skyscraper building MGT (fire, prevention, parking)</p> | <p>Prompt control (order, conduct, broadcast)</p> |

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3 Why 'kt powertel'?

2. What we offer

All IP-based PTT communication system connected with LTE network and IP-PTT platform of kt powertel.

Worldwide radio Coverage

➡ Anywhere PTT



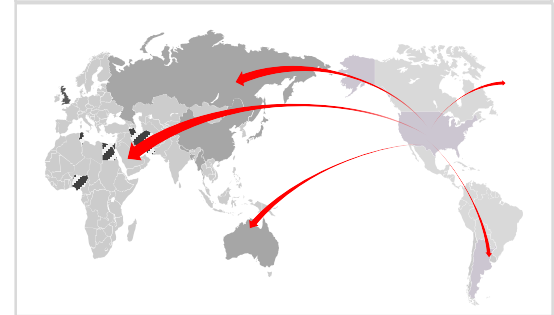
IP Convergence

➡ Customizing service



Pure kt powertel Technology

➡ World's First LTE PTT

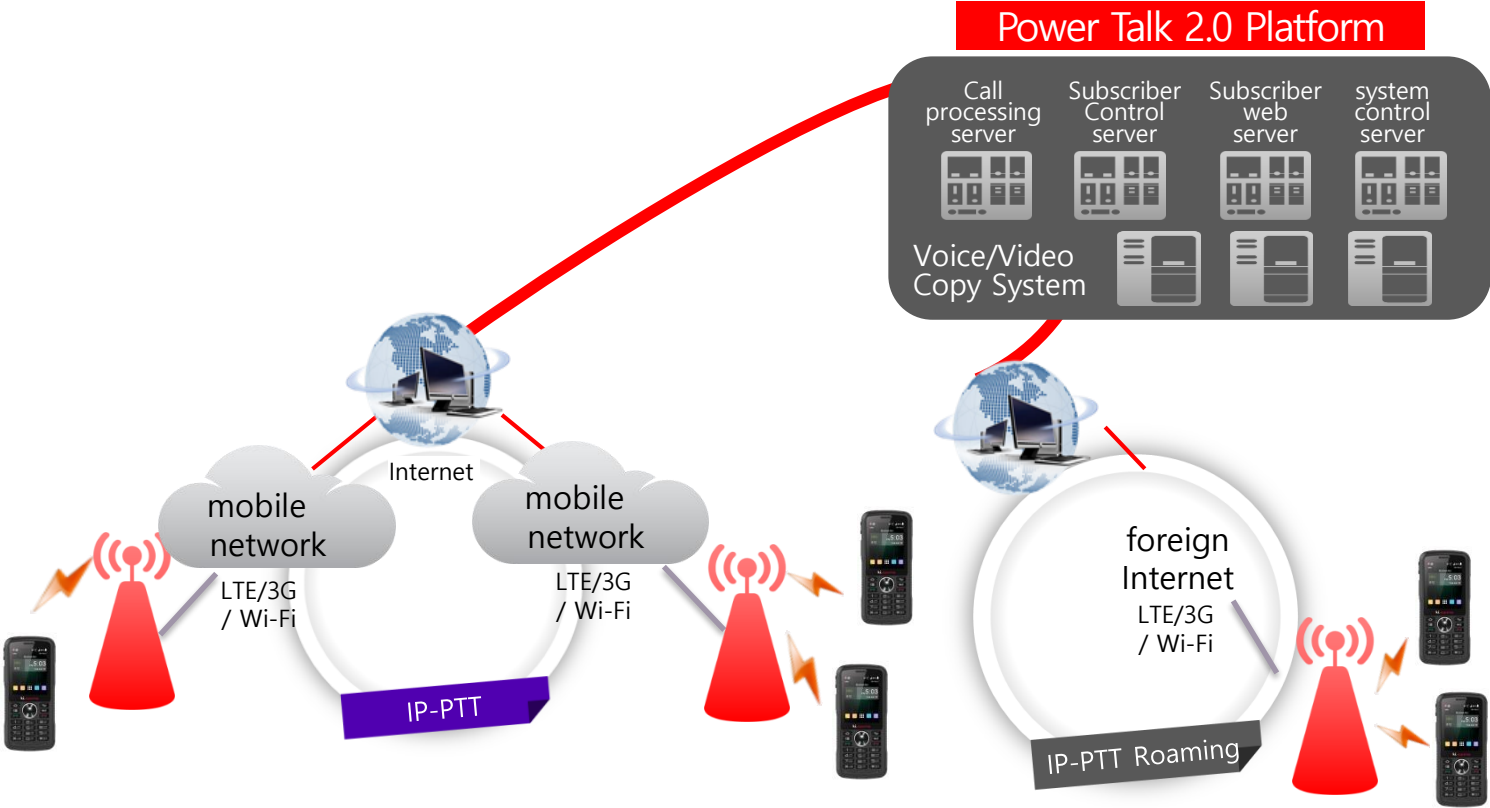


- In even vulnerable areas such as underground, tunnels and mountains, stable and seamless PTT
- Convergence can be all of IP-Based services(video transmission, location control solution, etc.)
- Technique developed as a pure technical 'kt powertel' that is based on the stable LTE network.

2. What we offer

Radio service available anywhere in the world if there is LTE or 3G or Wi-Fi network.

Service component



2. What we offer

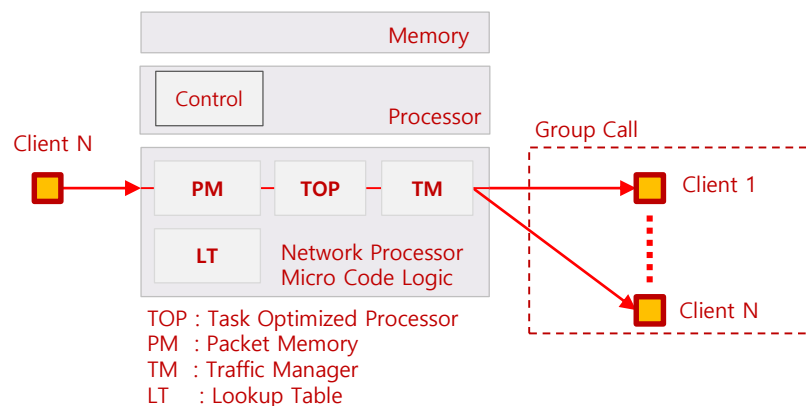
- ✓ high-speed voice copy technology based on H/W using the NP(Network Processor)
- ✓ capable of accepting large group calls as overwhelming server-based technology

Network Process Structure

Signaling & Data Traffic separating structure

- With hardware-based, **suitable for large group call processing**
- **Non-increasing traffic load** when using high-quality voice service
- Simultaneous Call Processing : **50,000 Call**

System structure



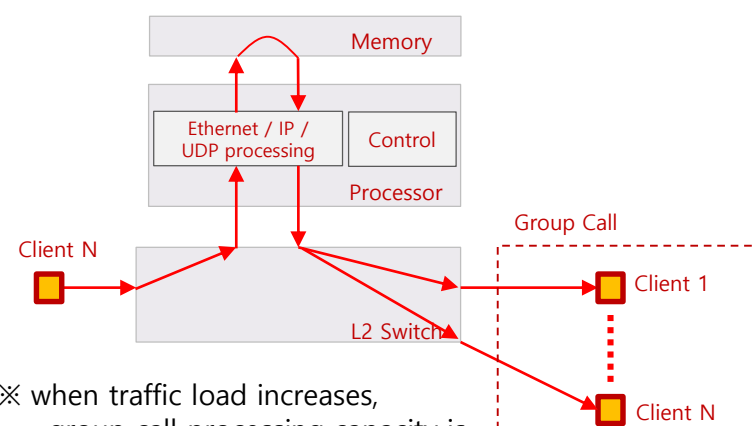
※ traffic separation Using a flexible packet processing architecture of the Network Processor

Server Process Structure

Signaling & Data Traffic integrated structure

- With software-based, **unsuitable for large group call processing**
- **increasing traffic load** when using high-quality voice service
- Simultaneous Call Processing : **200 ~ 1,000 Call**

System structure



※ when traffic load increases, group call processing capacity is limited

2. What we offer

As the combination of high-speed data and the IP, convergence with all IP based solutions such as secure command, ip-cctv etc. is possible.

Service expansion



2. What we offer

Enhanced IP based PTT dedicated terminal 'RADGER 3'.

◆ Overview

- Model name : RADGER 3
- Launching : February 20, 2017
- Feature
 - Standard Type
 - Touch Screen
 - PTT auto log-in function
 - Reliability device(1.5M Drop)

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | Video PTT |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 60*136*17.5mm(186g) | |
| O/S | Android 6.0 | |
| ROM | 8GB Flash | |
| RAM | 1GB DDR | |
| CPU | 1.1GHz quad-core | |
| Display | 2.6" Touch Screen | |
| Bluetooth | 4.0 | |
| Wi-Fi | IEEE 802.11 b/g/n | |
| (A)GPS | Yes | |
| Speaker | 2W(Max) | Easy-eye |
| Battery | 3,000mAh Li-polymer | |
| USB | Micro 5pin | |
| Media Player | Yes | MP3, MP4 |

2. What we offer

Smartphone Type IP based PTT dedicated terminal 'RADGER S'.

◆ Overview

- Model name : RADGER S
- Launching : November 11, 2018
- Feature
 - Smartphone Type
 - 5.0" Touch Screen(Glove and Wet touch)
 - IP68 grade water proof
 - MIL-STD810G
 - Reliability device(1.5M Drop)

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | Video PTT |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 76*156.5*14mm(240g) | |
| O/S | Android 8.1 | |
| ROM | 32GB Flash | |
| RAM | 3GB DDR | |
| CPU | 1.8GHz 8cores 64bits | |
| Display | 5.0" Touch Screen | Glove and Wet touch |
| Bluetooth | 4.1 | |
| Wi-Fi | IEEE 802.11 b/g/n | |
| Camera | Yes | 8M/13M |
| (A)GPS | Yes | Easy-eye |
| Speaker | 2W | |
| Battery | 4,000mAh Li-polymer | |
| USB | Type-C | |
| Media Player | Yes | MP3, MP4 |

2. What we offer

Rugged Type IP based PTT dedicated terminal 'RADGER T2'.

◆ Overview

- Model name : RADGER T2
- Launching : September 3, 2018
- Feature
 - Rugged Type
 - Touch Screen
 - Dual Camera(2M/8M)
 - IP68 grade water proof
 - Reliability device(1.5M Drop)

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | Video PTT |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 65.7*143*20mm(235g) | |
| O/S | Android 7.1 | |
| ROM | 16GB Flash | |
| RAM | 2GB DDR | |
| CPU | 1.3GHz quad-core | |
| Display | 2.6" Touch Screen | |
| Bluetooth | 4.2 | |
| Wi-Fi | IEEE 802.11 b/g/n | |
| Camera | Yes | 2M/8M |
| (A)GPS | Yes | Easy-eye |
| Speaker | 2.5W | |
| Battery | 3,000mAh Li-polymer | |
| USB | Micro 5pin | |
| Media Player | Yes | MP3, MP4 |

2. What we offer

Folder type IP based PTT dedicated terminal 'RADGER F2'.

◆ Overview

- Model name : RADGER F2
- Launching : Januariu 31, 2019
- Feature
 - Folder Type
 - Touch Screen(Dual LCD Display)
 - IP68 grade water proof
 - MIL-STD810G
 - Reliability device(1.8M Drop)

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | Video PTT |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 55.9*107*25.5mm(201.6g) | |
| O/S | Android 8.1 | |
| ROM | 16GB Flash | |
| RAM | 2GB DDR | |
| CPU | 1.3GHz quad-core | |
| Display | 2.6" Touch Screen | 1.54" TFT(External) |
| Bluetooth | 4.1 | |
| Wi-Fi | IEEE 802.11 b/g/n | |
| Camera | Yes | 3M/8M |
| (A)GPS | Yes | Easy-eye |
| Speaker | 2.5W | |
| Battery | 2,600mAh Li-polymer | |
| USB | Micro 5pin | |
| Media Player | Yes | MP3, MP4 |

2. What we offer

Entry-level IP based PTT dedicated terminal 'RADGER mini'.

◆ Overview

- Model name : RADGER mini
- Launching : November 5, 2018
- Feature
 - Low battery consumption display
 - PTT auto log-in function
 - EMR PTT, Quick PTT, ETC.
 - IP54 grade water proof
 - Reliability device(1.5M Drop)

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 56*116*15.5mm(113g) | |
| O/S | Android 7.1.1 | |
| ROM | 8GB Flash | |
| RAM | 1GB DDR | |
| CPU | 1.3GHz quad-core | |
| Display | 1.6" IPS QVGA mipi | |
| Bluetooth | 4.1 | |
| Wi-Fi | IEEE 802.11 b/g/n | |
| (A)GPS | Yes | |
| Speaker | 2W(Max) | Easy eye |
| Battery | 2,100mAh Li-polymer | |
| USB | Micro 5pin | |
| Media Player | Yes | MP3, MP4 |

2. What we offer

Entry-level IP based PTT dedicated terminal 'RADGER Lite'.

◆ Overview

- Model name : RADGER Lite
- Launching : August 1, 2017
- Feature
 - Group call only
 - Low battery consumption display
 - PTT auto log-in function
 - EMR PTT, Quick PTT, ETC.

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|-----------------------|------------------------------|
| Dispatch | Group call, EMR, UDCG | No Individual Call/Cellphone |
| Data | LTE data service | PTT, specialized App |
| Size(weight) | 55*105*18.5mm(112g) | |
| O/S | Android 7.1.1 | |
| ROM | 8GB Flash | |
| RAM | 1GB DDR | |
| CPU | 1.3GHz quad-core | |
| Display | 1.5"(OELD) | |
| Bluetooth | 4.0 | |
| (A)GPS | Yes | Easy eye |
| Speaker | 2W(Max) | |
| Battery | 2,000mAh Li-polymer | |
| USB | Micro 5pin | |
| LTE Band | 1/3/5/8 | |
| ETC | FM radio, MP3 Player | |

2. What we offer

Explosion-proof IP based PTT dedicated terminal 'RADGER IS'.

◆ Overview

- Model name : RADGER IS(Ex-Handy 09)
- Launching : March 1, 2017
- Feature
 - Touch Screen
 - Prevention of Explosion
 - IP68 grade water proof
 - High reliability device(2M Drop)
 - IECEx, ATEK, KCs Certification

◆ Shape



◆ Key Features and Specifications

| Division | Contents | Remarks |
|--------------|----------------------------------|----------------------|
| Dispatch | Individual/Group call, EMR, UDGC | Video PTT |
| Data | LTE data service | PTT, specialized App |
| Cellphone | Cellphone, SMS, MMS | VoLTE |
| Size(weight) | 64.5*137*26.6mm(326g) | |
| O/S | Android 4.4 | |
| ROM | 8GB Flash | |
| RAM | 1GB DDR | |
| CPU | 1.2GHz quad-core | |
| Display | 2.6" HVGA 320*432 | Touch Screen |
| Bluetooth | 4.0 | |
| Wi-Fi | 2.4GHz IEEE 802.11 b/g/n | |
| (A)GPS | Yes | Easy eye |
| Speaker | 1.1W(Max) | |
| Battery | 3,600mAh Li-polymer | |
| USB | Magnetic USB Cable | |

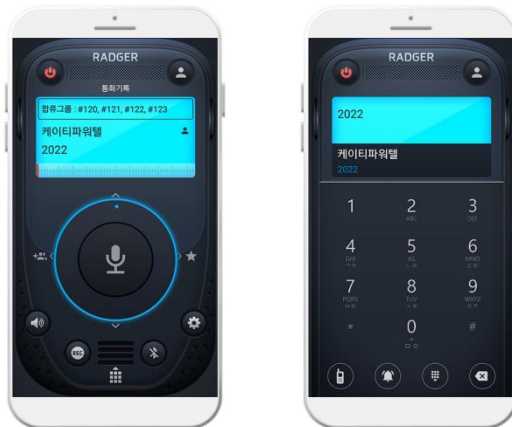
2. What we offer

LTE-PTT Smart-phone Application 'RADGER PTT'. A variety of PTT benefits provided by specialized functions.

◆ Overview

- Name : RADGER PTT
- The OS recommended :
 - Android : Lollipop(to Marshmallow)
 - iOS : 8.x version(to 9.x version)
- Accessory support
 - Bluetooth Speaker Mic, CODA-S, BTH101, General Bluetooth Accessory etc.

◆ Shape



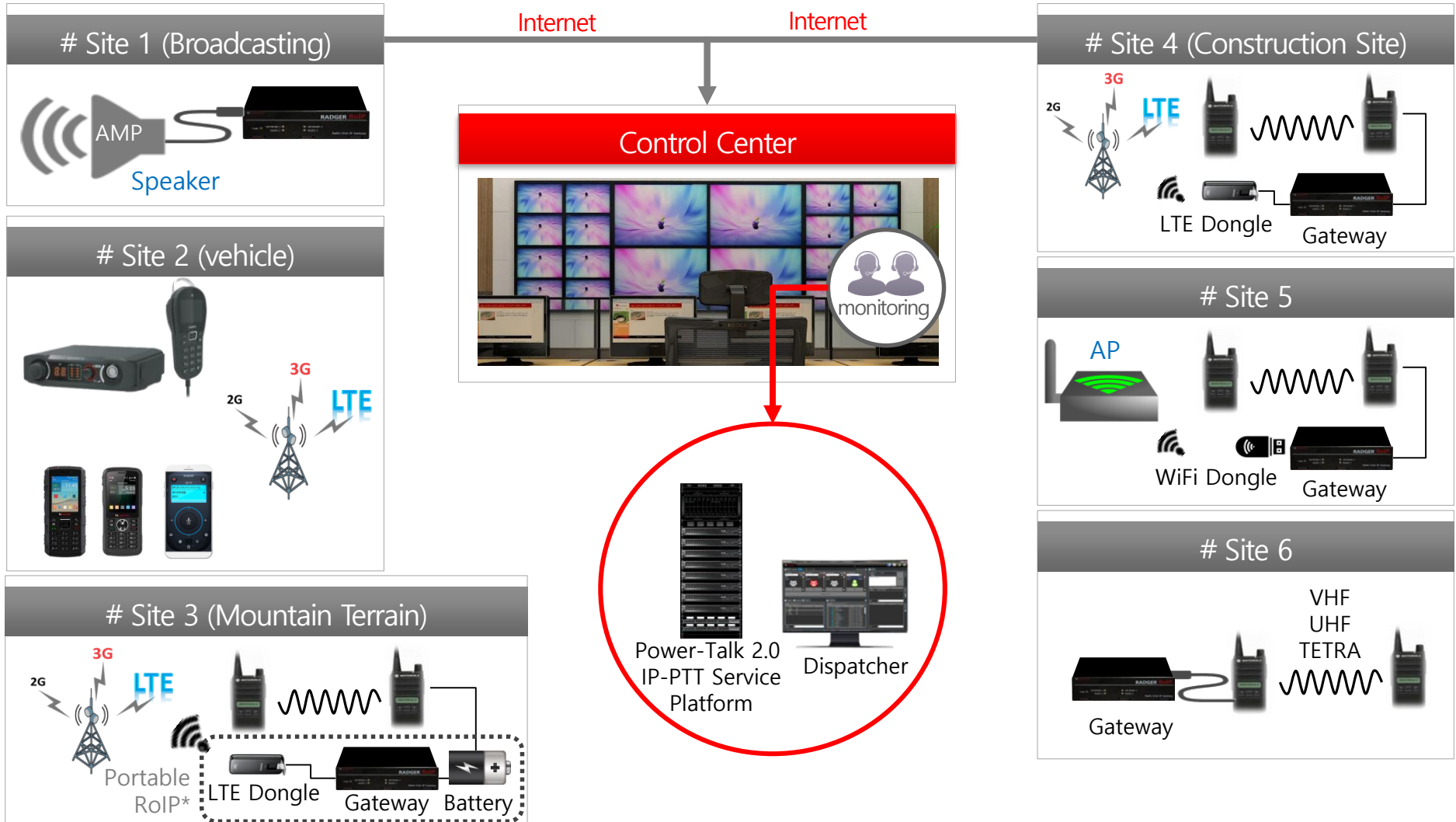
◆ Main function

| | |
|----------------|--|
| Power Talk 2.0 | <ul style="list-style-type: none"> · 1:1 individual PTT · 1:N selected/group PTT · HD Voice |
| PPS | Location control function on RADGER PTT |

◆ Additional service

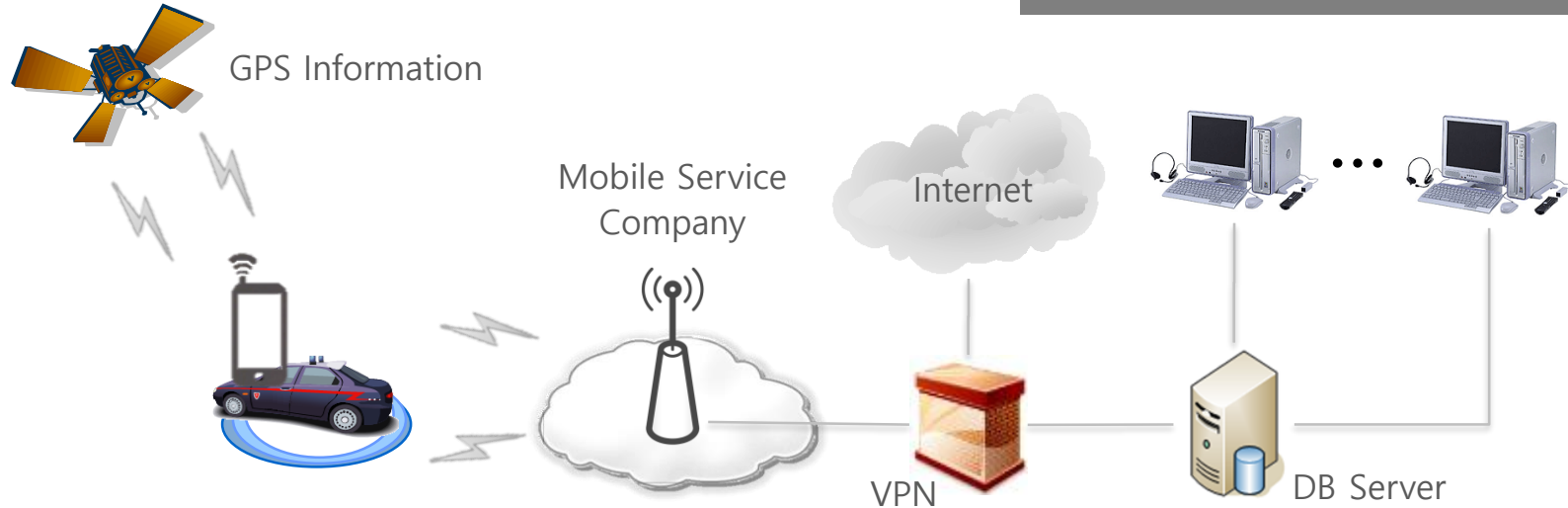
| | |
|-----------------------------|---|
| Secure Communication | Used Standard Encryption ARIA 256 Algorithm. |
| Emergency Group | When used Group PTT, another user that has 'Emergency Group Servicer' can send PTT. |
| Multi Group Receive Service | Can receive Group Call, until 4 group. |
| User Defined Group | Can use 'User Defined Group' with 20 users. |
| Full Duplex | Two-way communication as possible. |
| Voice Recorder | PTT recording as possible. |

2. What we offer



2. What we offer

Services Flowchart



1. Collect location information → 2. Transmit Position information → 3. Stored in DB → 4. Control of GPS Information

Function of the "Easy-eye"

- Transmit Real-time position
- Position Control
- 2D / satellite map display
- Cheap fare
- Variety of dedicated terminals

Client Application

◆ For Android



◆ For Web



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- IP-PTT Terminal 'RADGER'

- IP-PTT Application 'RADGER PTT'



- RoIP gateway

- Easy-eye

3 Why 'kt powertel'?

3. Flexibel business model

SI or Hosting Business as local business environment & demands
 → Two type business Supporting by kt powertel

| Model | Type | Structure | Merits & demerits |
|-----------------------------------|--|--|--|
| <p>1</p> <p>SI (Turn-key)</p> |  | <ul style="list-style-type: none"> - IP PTT Plaform, terminals, App combined Package - Local network interlock - Optimized service | <ul style="list-style-type: none"> ▪ Product, service customer value ▪ Better service quality ▪ Load of Initial CAPEX |
| <p>2</p> <p>ASP (Hosting)</p> |  | <ul style="list-style-type: none"> - kt powertel Plaform with dedicated circuit - (kt powertel) Tech Support - (local carrier) recruit customer Plaform license fee | <ul style="list-style-type: none"> ▪ Business Penetration without Initial CAPEX ▪ Short term business ▪ Less service quality of environment |

3. If you have a Business Partnership with us...

Business Opportunity / Value Expand

- Short time to market with competitive service
- Service value expansion based all IP



Maximize profitability in efficient business model

- Flexibel business structure compared with TRS business
- Unnecessary initial network investment, management



Expansion of Global markets as excusive distributor

- Easy PTT Market expansion of LTE network
- Global business of Local joint-venture as a excusive distributor



Thank you | **kt** powertel