

RoIP (Radio over IP) Solution for Mine Project



Radio over IP Solution

- IPNext2000 IP-PBX
- AP-PTS3000 PTT Server
- AP-LMR2000 LMR Gateway
- AP-LMR1000 LMR Gateway
- AP-IP300 IP Phone
- AP-IP230 IP Phone

[Learn More >](#)

The advertisement features a collection of AddPac hardware including two IP phones, a handheld radio, a desktop phone, two LMR gateway units, and a rack-mounted server unit.



AddPac

AddPac Technology

Sales and Marketing

Contents

- AddPac RoIP Solution
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 - IPNext600 IP-PBX + PTT Server
 - LMR (Land-to-Mobile Radio) Gateways for RoIP Service
 - IP Phones for RoIP Service
 - WSMM(Web Smart Multimedia Manager) for RoIP Solution

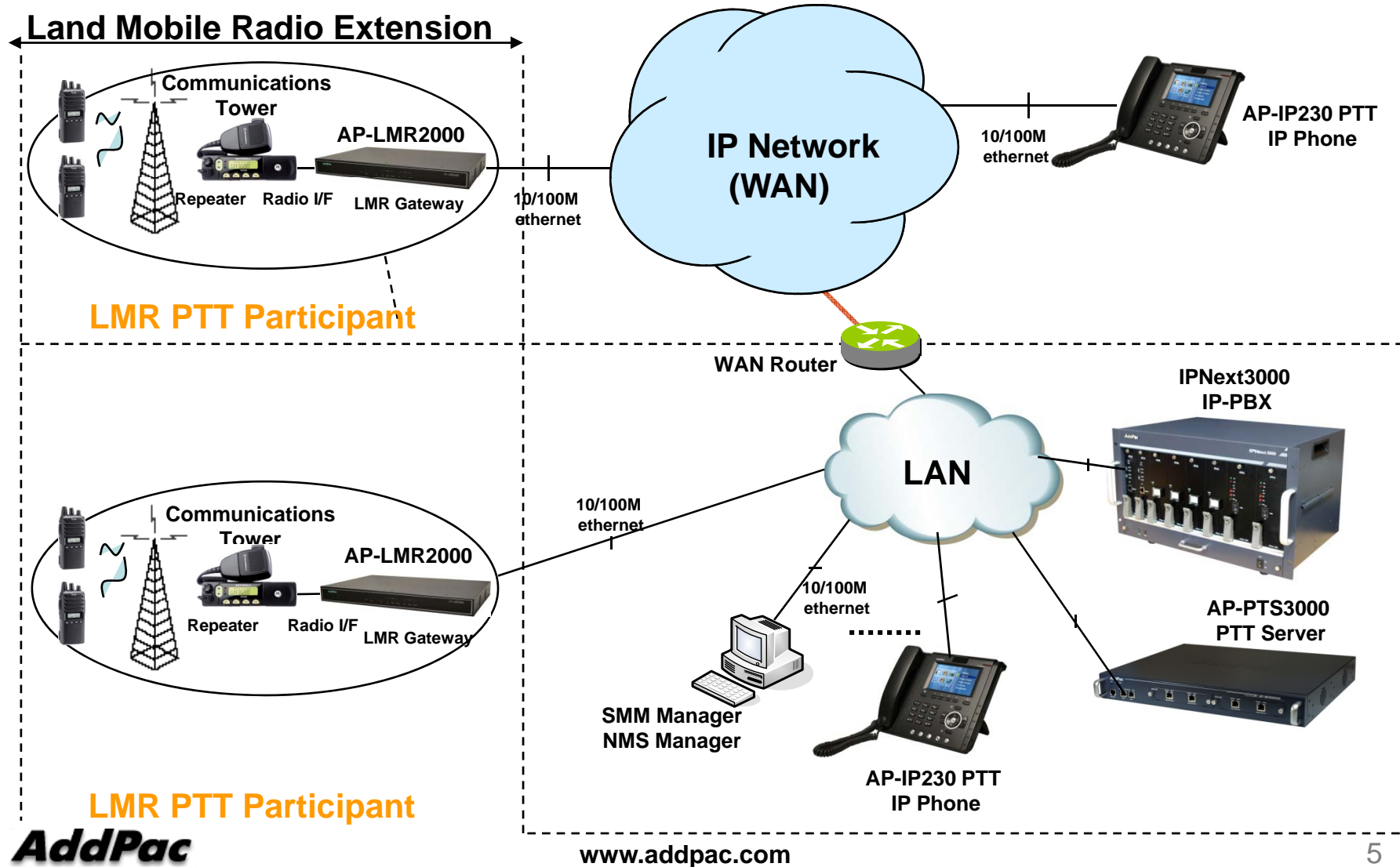
AddPac RoIP Solution

- LMR system overview
 - A LMR(Land Mobile Radio) system is a collection of portable and stationary radio units designed to communicate with each other.
 - LMR is deployed wherever organizations need to have instant communication between geographically dispersed and mobile personnel.
 - Typical LMR system users are public safety organizations (ex: police departments, fire departments, etc).
 - The systems are extended the range of communications by repeaters.
 - The systems are required interoperability with IP network.

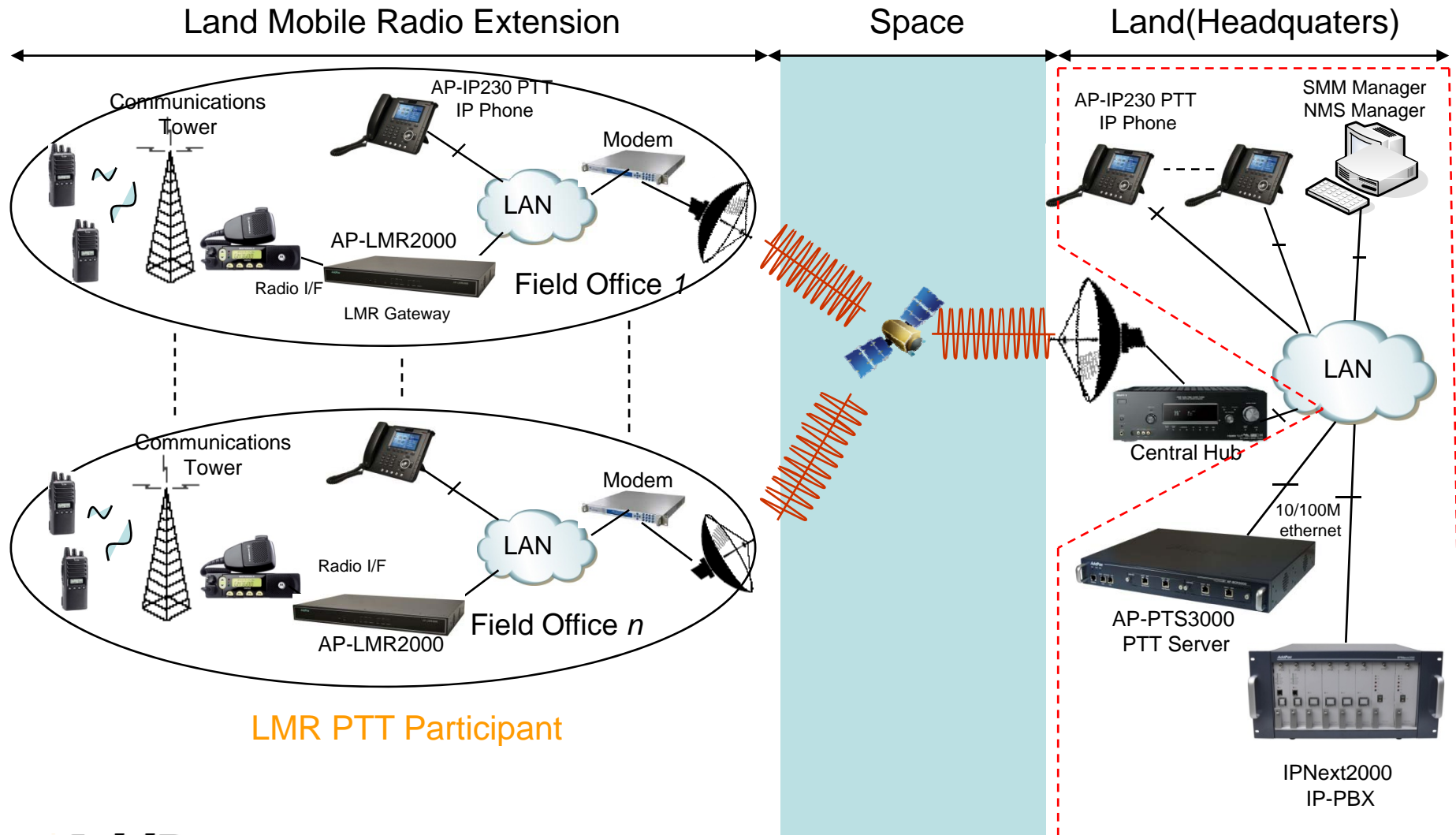
AddPac RoIP Solution

- AddPac RoIP Solution Features
 - LMR Gateway(AP-LMR2000) joins the LMR systems to the IP network through open SIP standard and RTP.
 - The radios are connected to LMR gateway through AddPac radio interface (reference LMR signal).
 - AddPac IP PTT terminals (AP-IP230, AP-IP300 IP Phones, AP-WP100 WiFi-Phone, etc) support the traditional radio user interface(PTT).
 - AddPac IP PTT terminals easy PTT group management user interface.
 - IP-PBX support call management, PTT group management, PTT control and various additional service.
 - PTT Server(AP-PTS3000) support powerful media data relay, broadcasting, multicasting and PTT group management.
 - RoIP Solution supports emergency and group PTT service.

RoIP Network Diagram (1/2)

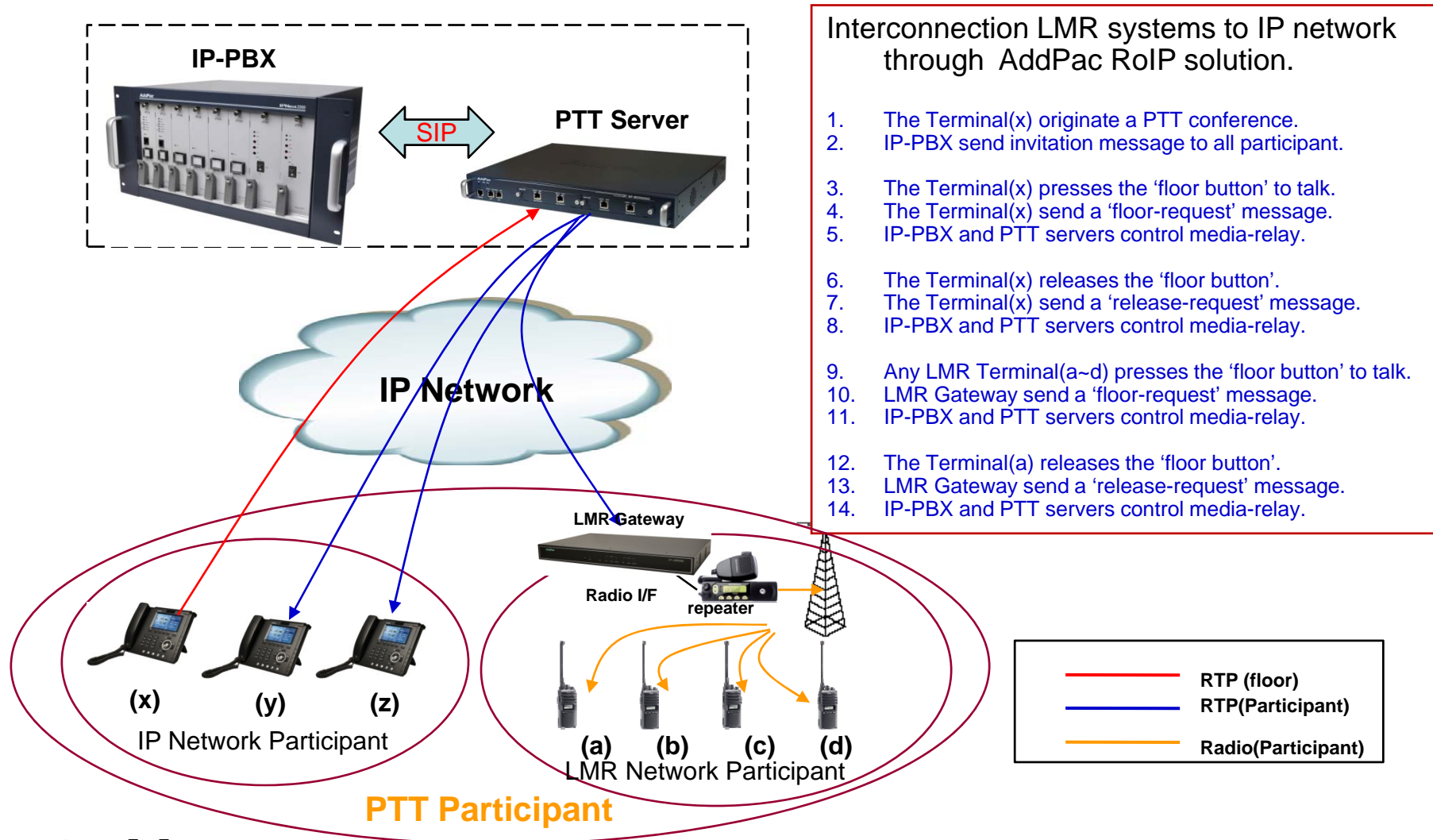


RoIP Network Diagram(2/2)



RoIP Call Service Examples

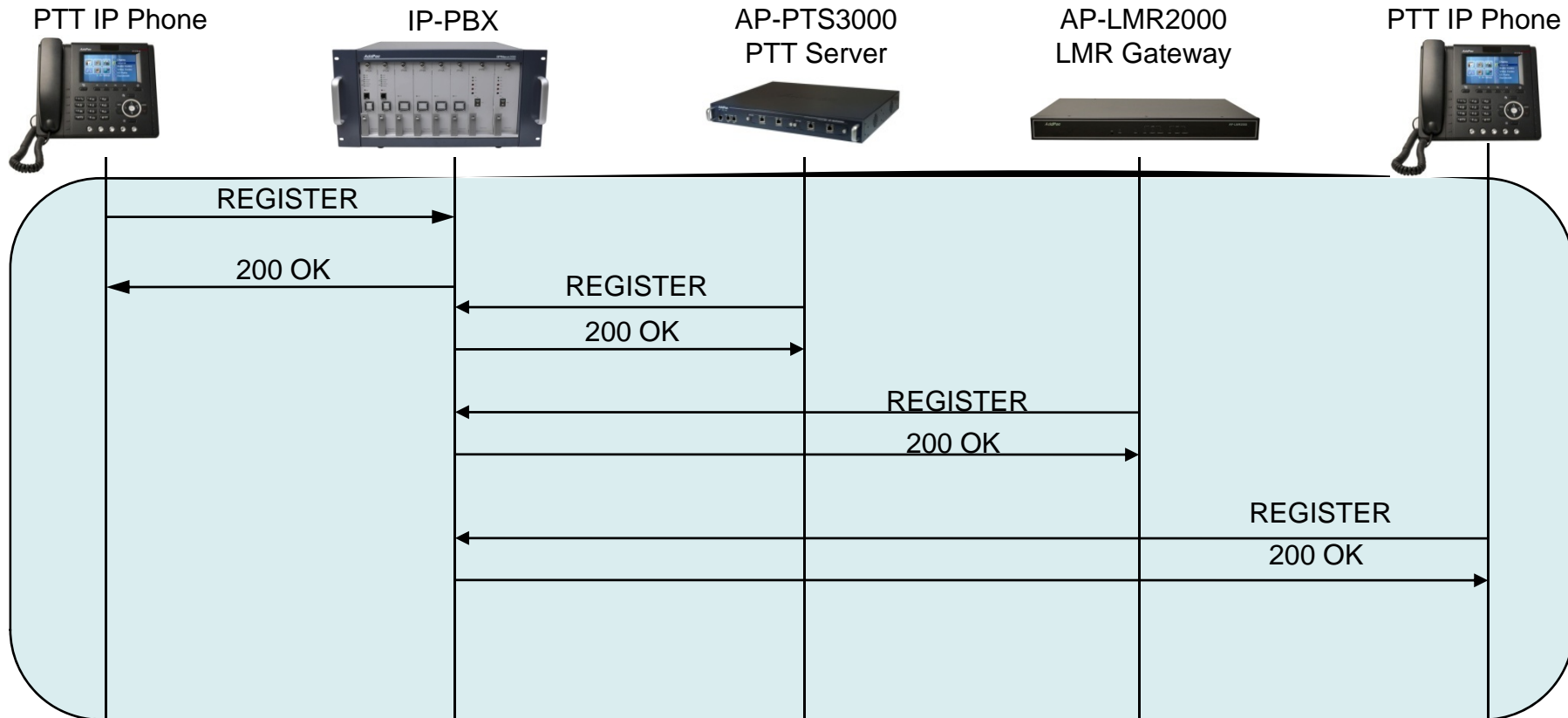
Interconnection LMR systems through PTT Server



- Interconnection LMR systems to IP network through AddPac RoIP solution.
1. The Terminal(x) originate a PTT conference.
 2. IP-PBX send invitation message to all participant.
 3. The Terminal(x) presses the 'floor button' to talk.
 4. The Terminal(x) send a 'floor-request' message.
 5. IP-PBX and PTT servers control media-relay.
 6. The Terminal(x) releases the 'floor button'.
 7. The Terminal(x) send a 'release-request' message.
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 12. The Terminal(a) releases the 'floor button'.
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 14. IP-PBX and PTT servers control media-relay.

RoIP System Message Flow

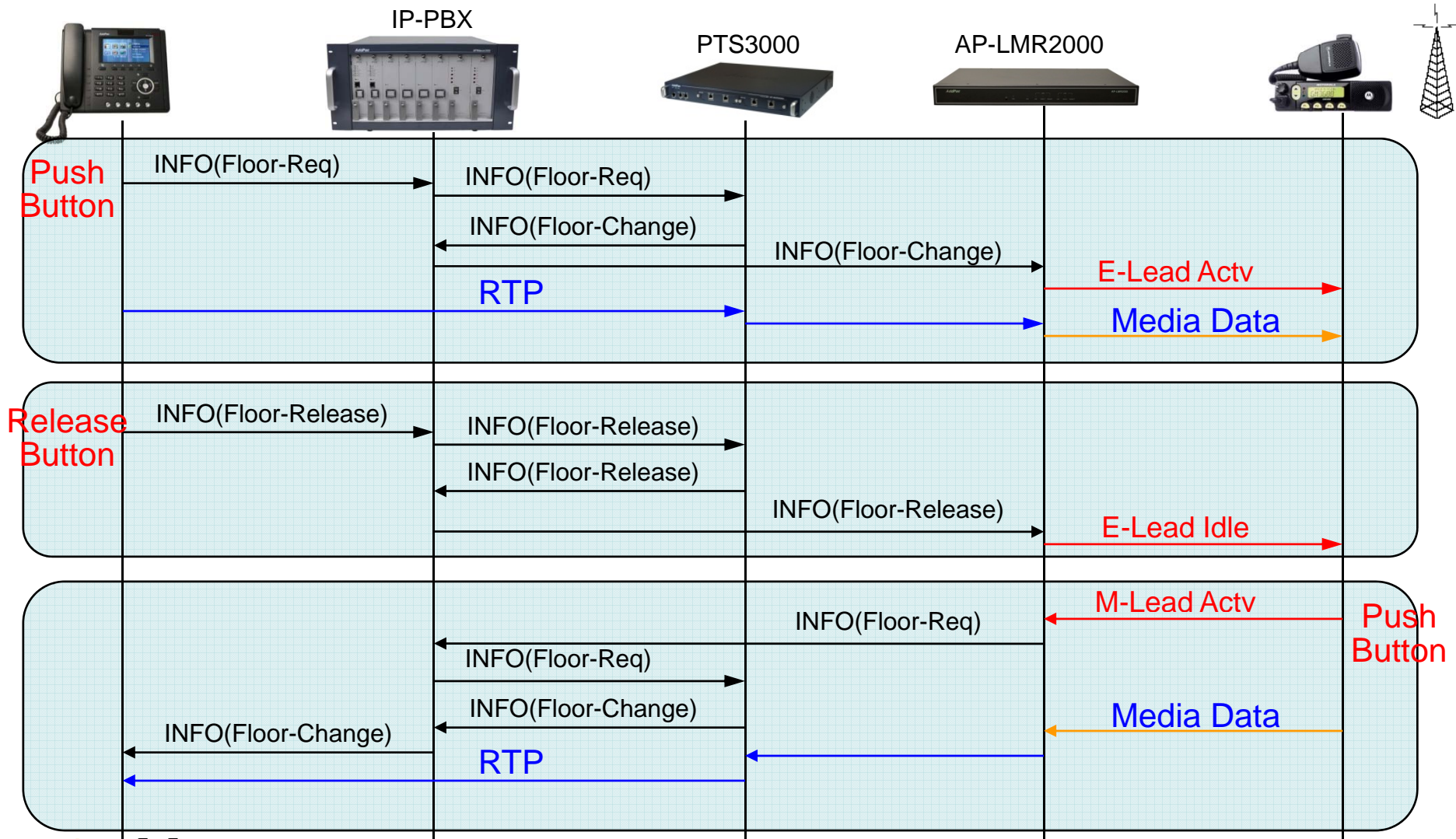
SIP Message Flow (Register)



All Participants register to IP-PBX for PTT service.

RoIP System Message Flow

SIP Message Flow (Floor Control : Push To Talk)



IP based PTT Call Scenario (1/3)

- **Hot key usage**

- Move to push to talk List menu

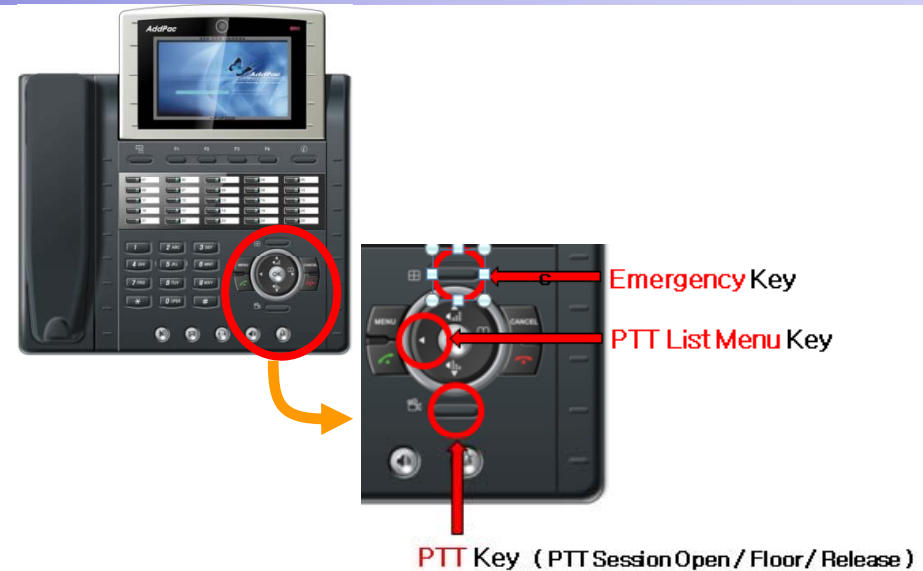
1. **Press PTT key** < figure – 1>

- Join

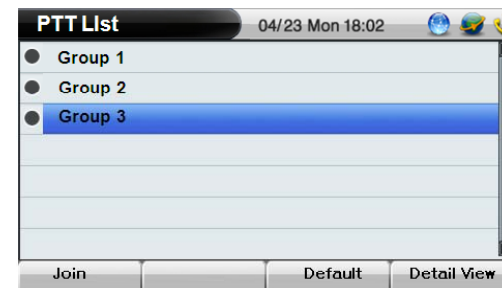
1. Move to PTT list menu
2. Select a PTT group.
3. Press Menu key and select 'Default' and ok key

< figure – 2>

1. So, If **press and hold PTT key**,
Join to your 'Default' PTT group
In Idle state



< figure – 1>



< figure – 2>

IP based PTT Call Scenario (2/3)

Common Usage

Phase	Originator	Participant
Join	1. Press PTT key 2. Input Phone Number or Group Number	3. Notify Join w/ effect sound
Communication	Press and hold 'PTT key' and then speak to MIC	
Exit	Explicit exit : 'End key' Implicit exit : Automatic exit by server	

IP based PTT Call Scenario(3/3)

Emergency PTT with Alarm Notification

Phase	Originator	Participant
Join	1. Press right function key <i>< page9 figure – 1 ></i> 2. Input Phone Number or Group Number 4. Request emergency PTT service to server	3. Notify Alarm w/ siren sound <i>< figure – 1 ></i> 5. Notify Join w/ effect sound
Communication	Press and hold 'PTT key' and then speak to MIC <i>< figure – 2 ></i> <i>(Ignore any other PTT and call events)</i>	
Exit	Explicit exit : 'End key' Implicit exit : Automatic exit by server	



Replace current Image to New On

< figure – 1 >



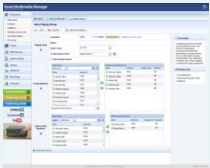



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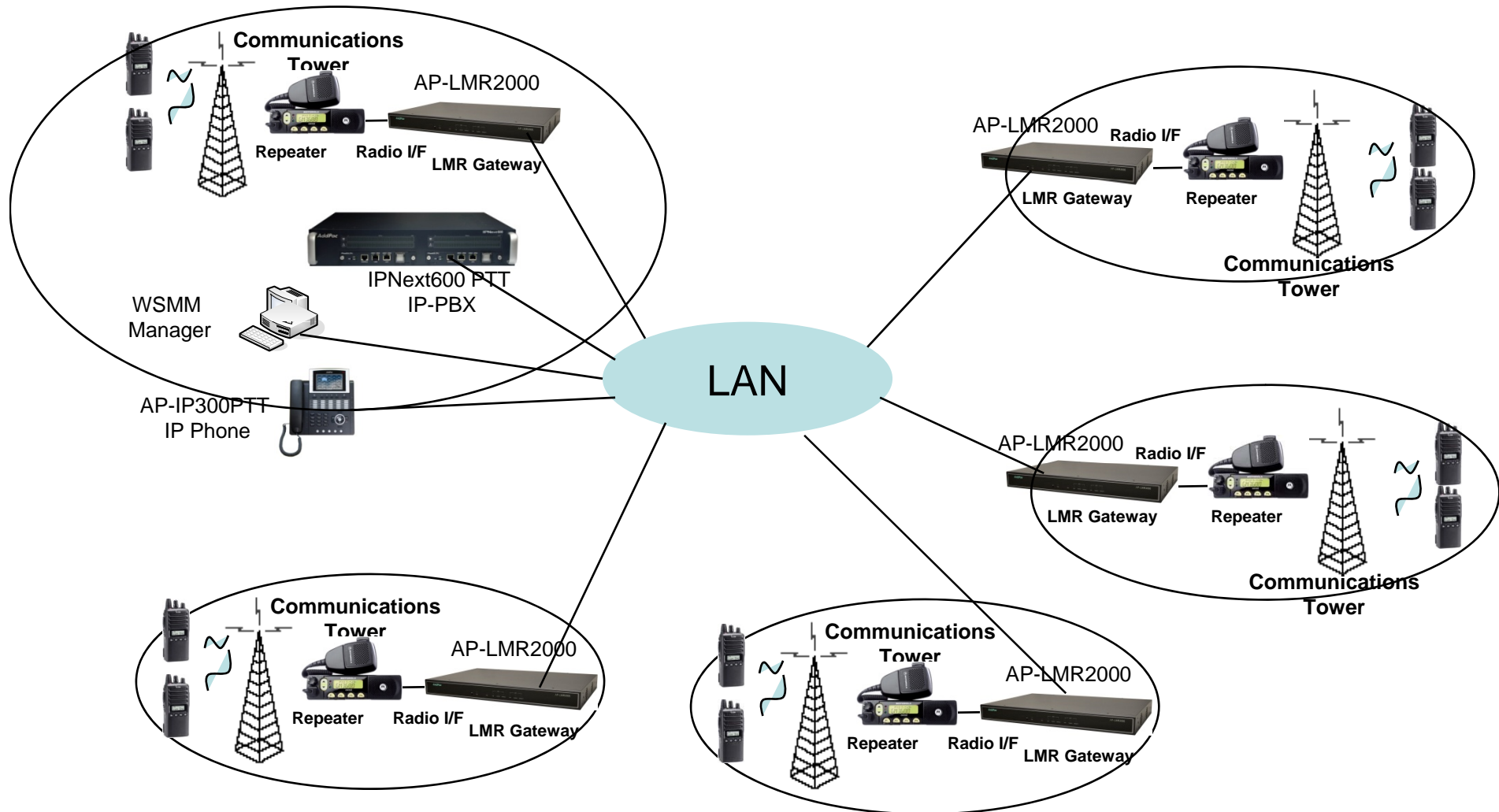


RoIP Solution Components for Mine Project

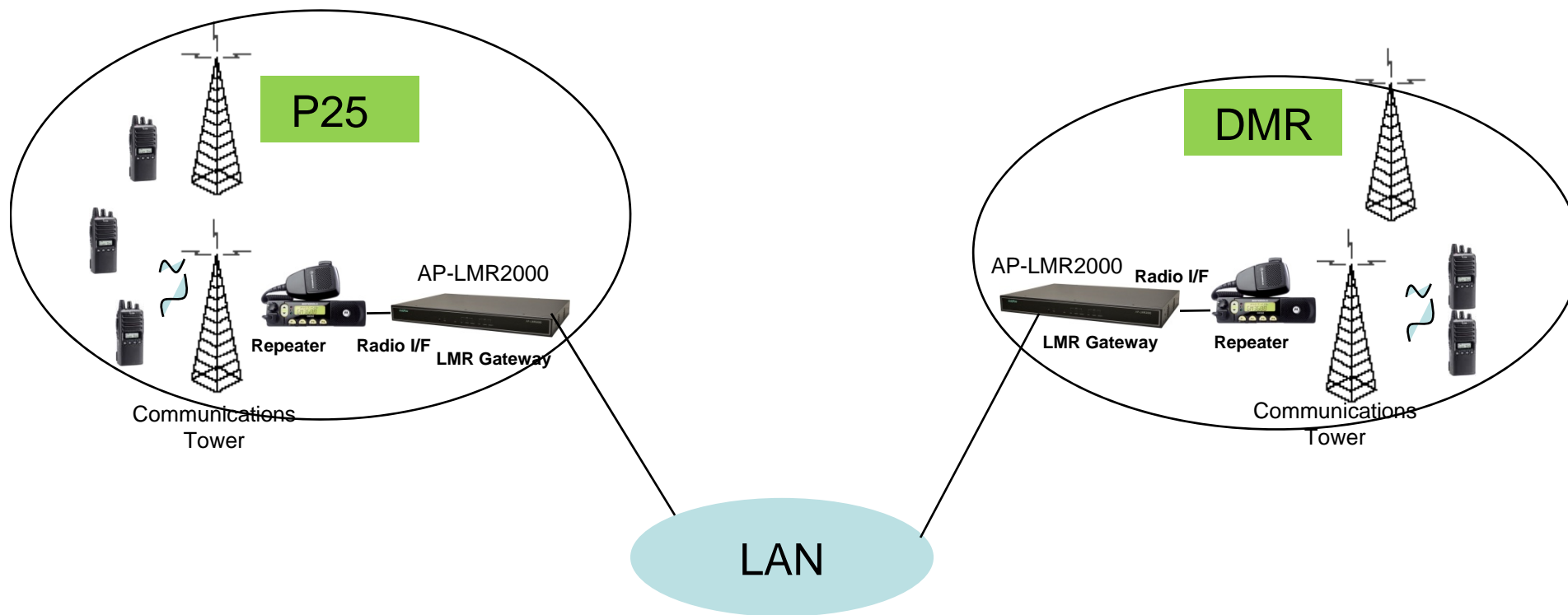
PTT over IP Solution Product Table

PTT & Paging S/W	IPNext600PTT	AP-IP300 PTT IP Phone	AP-LMR2000 LMR Gateway
			
Smart Web Manager	<p>IP based PTT Service Support</p> <p>Dial-Out based PTT Service Support</p> <p>Advanced PTT Server Features</p> <p>Emergency PTT Service Support</p> <p>IP-PBX Interworking Service</p> <p>SIP Call Manager</p> <p>System Redundancy</p> <p>Power Redundancy</p>	<p>High End IP Phone</p> <p>4.3 Inch Color LCD</p> <p>External Audio In/Out</p> <p>Two(2) Fast Ethernet</p> <p>25 Speed Dial button with Lamp</p> <p>Push-to-Talk Service</p> <p>SIP, H.323 Signaling Support</p> <p>VoIP Codec (G.711,G.729,etc)</p>	<p>Radio over IP Service Support</p> <p>Radio Systems(Motorola, etc) are Extended to IP Network</p> <p>RISC Microprocessor Computing Power</p> <p>Two(2) 10/100Mbps Fast Ethernet</p> <p>One(1) RS-232C Console (RJ45)</p> <p>Two(2) Radio Module Slots for E&M, etc</p>

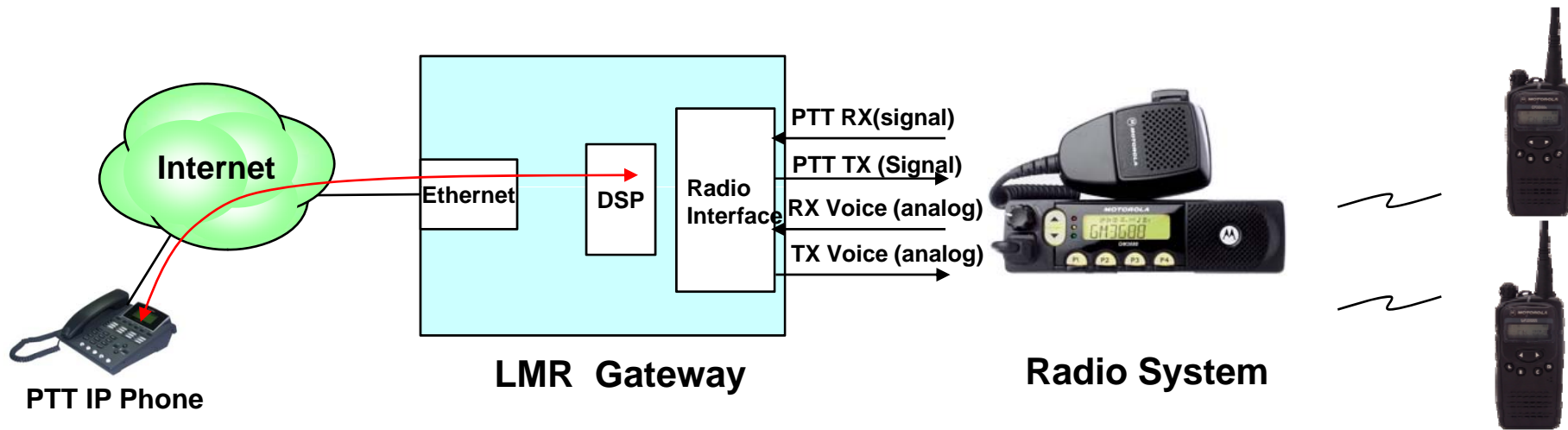
RoIP Network Diagram (Multiple RoIP Network)



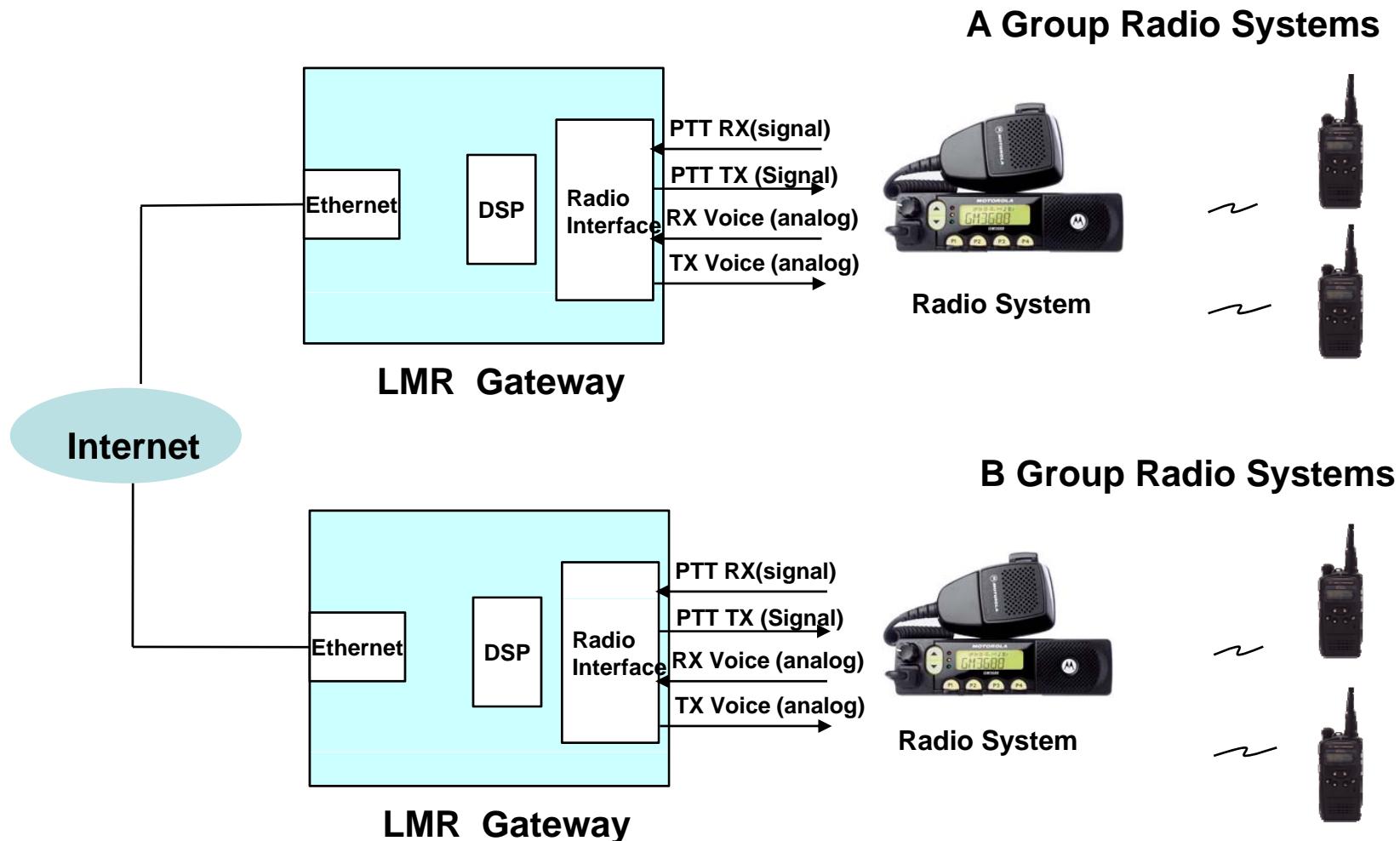
RoIP Network Diagram (1:1 RoIP Network)



System Interface between LMR Gateway and Radio



Peer-to-Peer LMR Gateway Service (Remote)



IPNext 600 PTT IP-PBX System (IP-PBX + PTT Server)



Product Overview

IPNext600PTT Next Generation IP-PBX System

- SIP Application Server, Proxy, Registrar and Location Server
- Multiple ITSP Trunk with SIP & H.323 Accounts Support
- High Performance PTT Server Solution
- Dual System Redundancy Architecture
 - Two(2) Fast Ethernet Interface / System
- High Performance RISC Architecture
- Powerful Network Protocols (PPPoE, DHCP, Static Routing, etc)
- IPv4/IPv6 Dual Stack
- RTP Proxy Function Embedded for Private IP and IPv6 Address Interworking
- User Presence Service Features for Smart Multimedia Messenger and Smart IP Phone
- IVR Scenario Editor, Voice Mail, Media Service (Coloring), Conference
- Firmware Upgradeable Architecture
- Smart Multimedia Manager for IP-PBX Management
- Smart Messenger Service (click to dial) for Unified Communication
- Smart NMS for Large Scale Deployment
- Advanced Voice QoS Mechanism
- Dual Redundancy Power Module
- Various IP Terminal Support

PTT Server Service

IPNext600PTT Next Generation IP-PBX System

- IP based PTT Service Support
- Dial-Out based PTT Service Support
 - Multi-Session, Multi-Group
 - PtP (Point-to-Point) Service
- Advanced PTT Server Features
 - 1:1 PTT
 - Group PTT
 - Emergency PTT with Alarm Notification
- Emergency PTT Service Support
- IP-PBX Interworking Service
- IP Terminal Interworking Service (Wi-Fi Phone, IP Phones, Soft Phone, Smart Phone Application)
- PTT Solution with Outstanding Network Service Capability

Hardware Specification

IPNext600PTT Next Generation IP-PBX System

RISC
CPU

- 64bit High-End Microprocessor Computing Power
- Main Chassis
 - Dual Redundancy CPU Boards for System Fault Tolerant
 - Two(2) 10/100Mbps Gigabit Ethernet
 - One(1) RS-232C Console (RJ45)
 - Dual Redundancy Power Supply Module
 - Hot-Swap Features

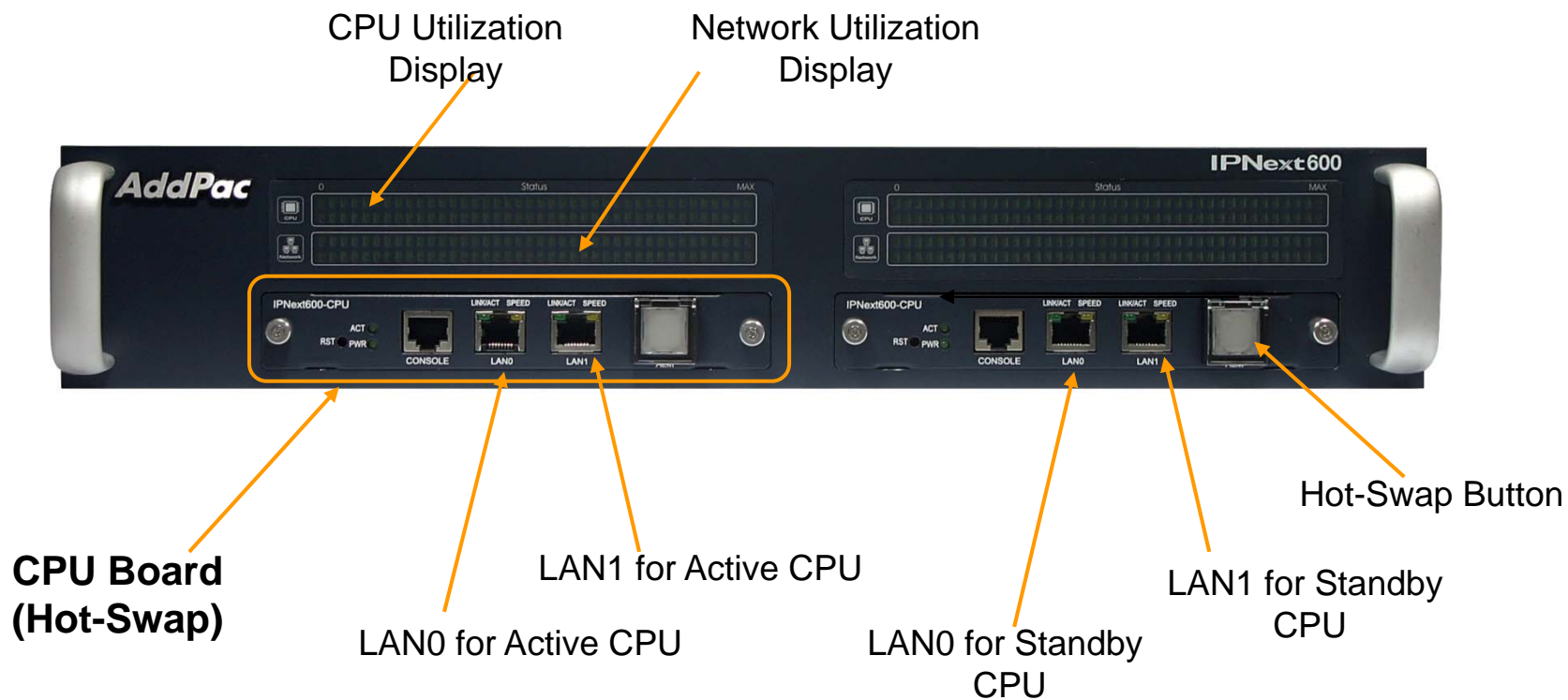


Hardware Specification

IPNext600PTT Next Generation IP-PBX System

RISC
CPU

Front Side



Hardware Specification

IPNext600PTT Next Generation IP-PBX System



Back Side

Dual Power Supply Modules
(Hot-Swap)



PSU Module A

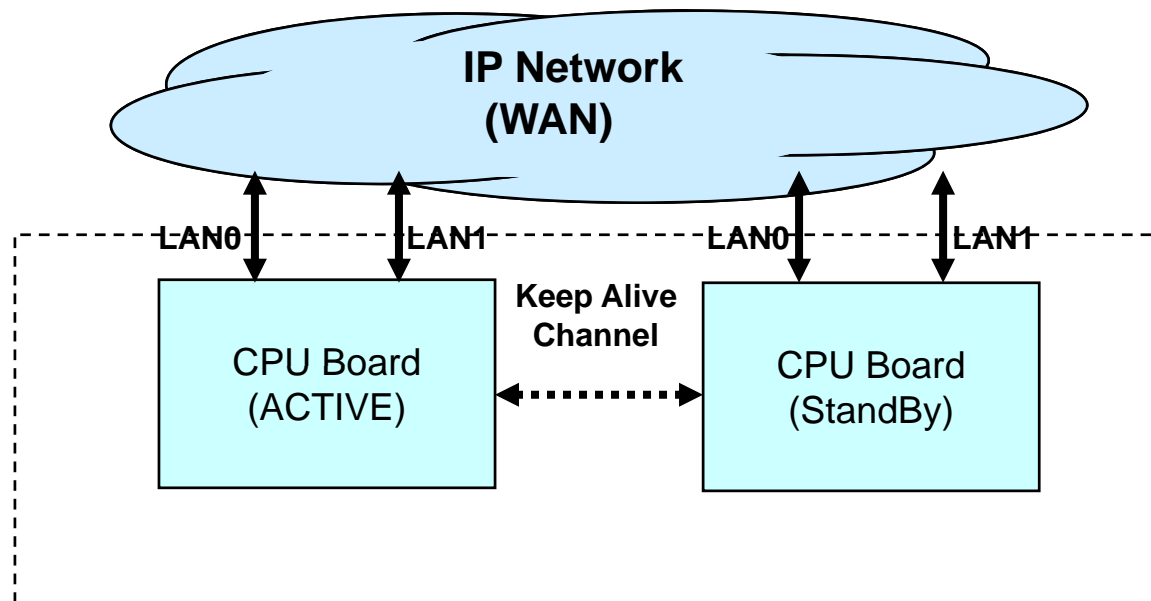
PSU Module B

Power On/Off Switch
for System

System Redundancy Features

IPNext600PTT Next Generation IP-PBX System

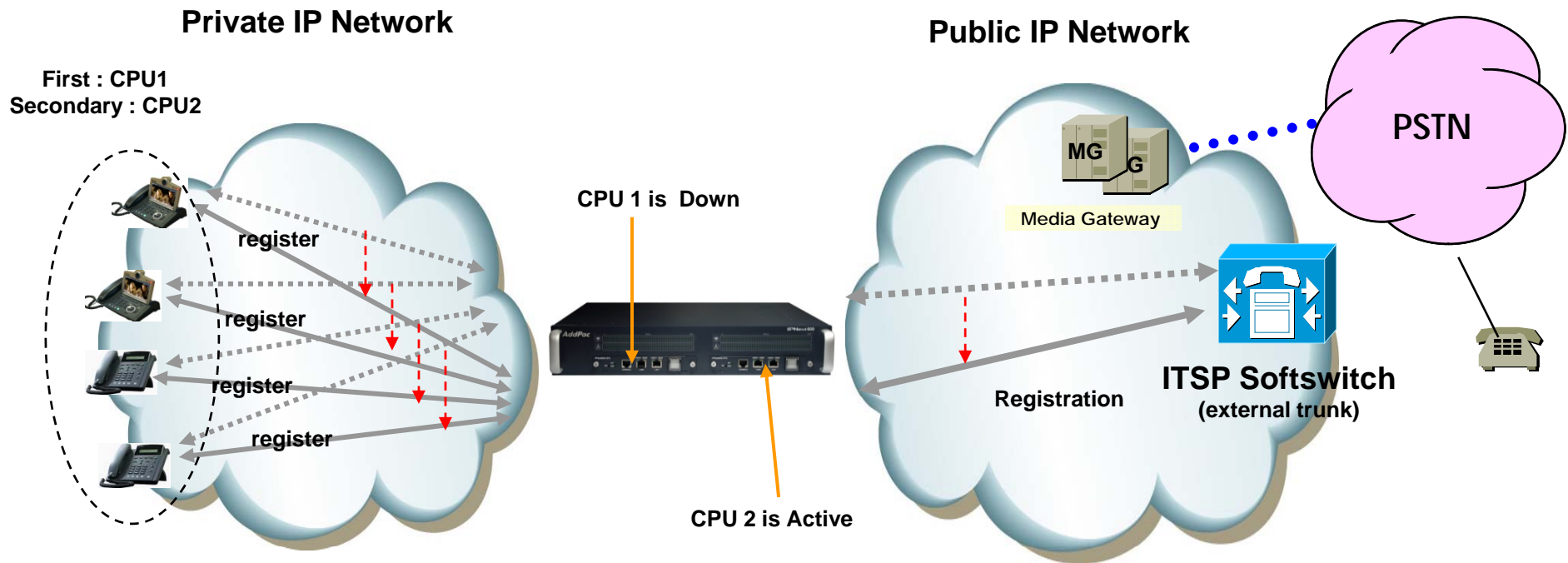
IPNext600PTT System Block Diagram



System Redundancy Features

IPNext600PTT Next Generation IP-PBX System

- Active– Active Duplication Scheme
- Active – Standby Duplication Scheme
- VRRP based Duplication Scheme



Active – Standby Duplication Scheme (example)

AP-IP300 IP Phone for PTT Service



Main Features

AP-IP300 IP Phone

- 4.3 Inch Color LCD Display
- External I/O Interface
 - Audio In/Out
 - Two(2) Fast Ethernet Interface
 - PSTN FXO Interface (optional)
- PoE (Power over Ethernet) Support
- 25 Speed Dial button with Presence Indication Lamp
- Audio Broadcasting Controller & Terminal
- Providing Powerful Push-to-Talk Service
- Powerful Color GUI
- IPv4/IPv6 Address Support
- SIP, H.323 Signaling Support
- High-end Error Resilient Against Various Packet Error

Hardware Specification

AP-IP300 IP Phone

- RISC+DSP Microprocessor Computing Power (Dual Processor Architecture)
- High Quality 4.3 Inch Color LCD Panel
- 25 Speed Dial Key & User Presence Indication LED
- Optional PSTN Backup Interface
 - FXO Interface
- High quality Audio and Voice Interface
 - Stereo Audio Input Connector
 - Stereo Audio Output Connector
- Network Interface
 - Two(2) 10/100Mbps Fast Ethernet
- USB Host Mode Interface
 - USB Memory(Flash, HDD), etc
- Power Supply
 - Power over Ethernet
 - External Power Adaptor (5V, 3A)



Hardware Specification

AP-IP300 IP Phone



AP-LMR2000

LMR(Land-to-Mobile Radio) Gateway



Contents

- Product Overview
- Hardware Specification
- LMR(Land-to-Mobile Radio) Service
- RoIP System Message Flow Diagram

Product Overview

AP-LMR2000 LMR Gateway

- Radio over IP Service Support
- Radio Systems(Motorola, etc) are Extended to IP Network
- High Performance RISC & Programmable DSP Architecture
- Two(2) 10/100Mbps Fast Ethernet (IP Share ,etc)
- High Performance LAN-to-LAN Routing Capability
- Two(2) Module Slots for Radio Interface (E&M, etc)
- VoIP Codec : G.711/G.726/G.723/G.729, VAD, etc
- Powerful Network Protocols (PPPoE, DHCP, Static Routing, etc)
- IPv4/IPv6 Dual Stack Support
- SIP/H.323 Dual Concurrent Signaling Protocols
- Firmware Upgradeable Architecture
- Advanced Voice QoS Mechanism
- Powerful Web based Management
- RS232C Port Support for Command Line Interface

Hardware Specification

AP-LMR2000 LMR Gateway

RISC
CPU

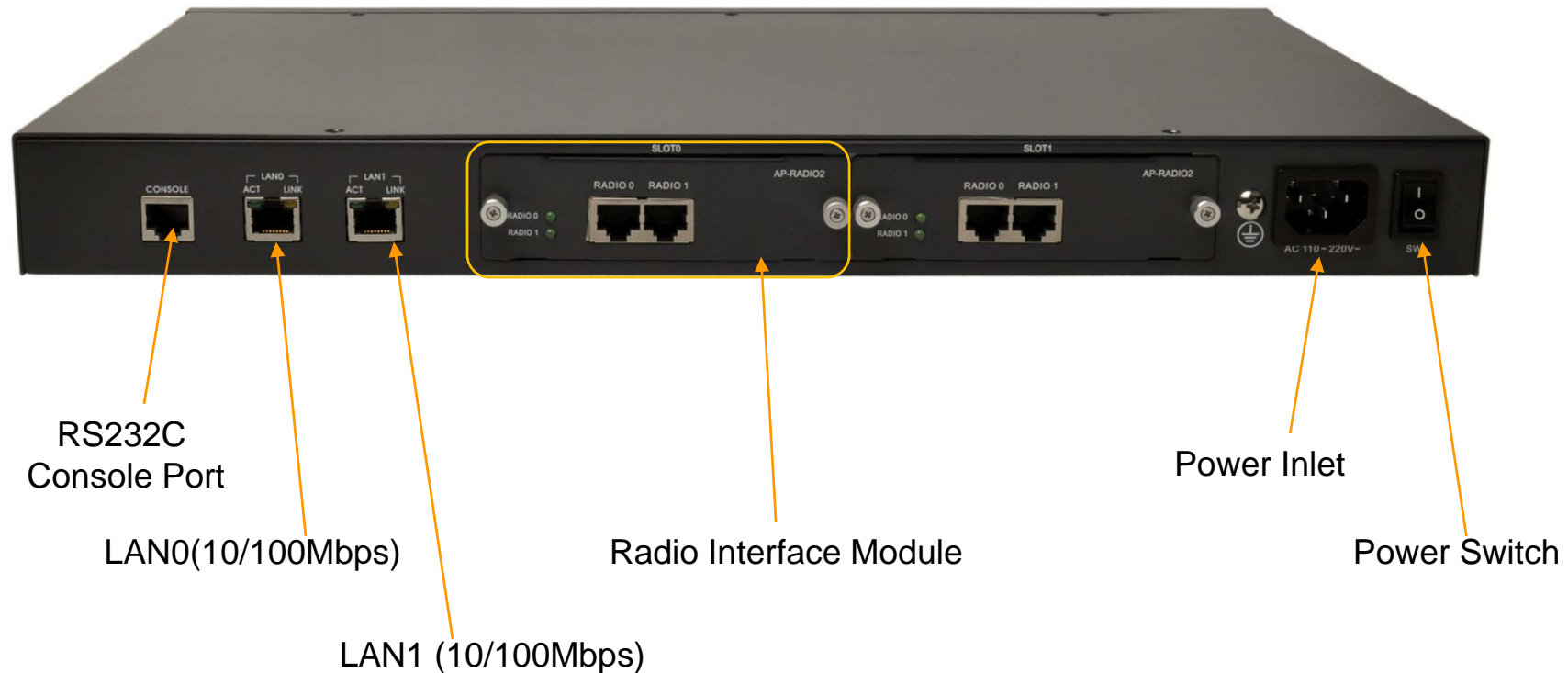
High-end
DSP

- RISC Microprocessor Computing Power
- Main Chassis
 - Network Interface
 - Two(2) 10/100Mbps Fast Ethernet
 - One(1) RS-232C Console (RJ45)
 - Two(2) Radio Module Slots for E&M, etc
 - Internal Power Supply

Hardware Specification

AP-LMR2000 LMR Gateway

AP-LMR2000 Back Side



Hardware Specification

AP-LMR2000 LMR Gateway

Example : AP-RADIO2 E&M Interface Module for Radio Interworking



Hardware Specification

AP-LMR2000 LMR Gateway

Example : E&M Interface for Radio Interworking

Lead Name	Pin	Description
E (Ear or Earth)	Pin 7	Signal wire asserted by the router toward the connected device. Typically mapped to the push-to-talk (PTT) lead on the radio.
M (Mouth or Magnet)	Pin 2	Signal wire asserted by the router toward the connected device. Typically mapped to the push-to-talk (PTT) lead on the radio.
SG (Signal Ground)	Pin 8	Used on E&M signaling Types II, III, and IV.
SB (Signal Battery)	Pin 1	Used on E&M signaling Types II, III, and IV.
Two-Wire Mode		
T1/R1 (Tip-1/Ring-1)	Pin 4,5	In two-wire operation, the T1/R1 leads carry the full-duplex audio path.
Four-Wire Mode		
T/R (Tip/Ring)	Pin6,3	In a four-wire operation configuration, this pair of leads carries the audio in from the radio to the router and would typically be connected to the line out or speaker of the radio.
T1/R1 (Tip-1/Ring-1)	Pin5,4	In a four-wire operation configuration, this pair of leads carries the audio out from the router to the radio and would normally be connected to the line in or microphone on the radio

LMR Service

AP-LMR2000 LMR Gateway

- LMR system overview
 - A LMR(Land Mobile Radio) system is a collection of portable and stationary radio units designed to communicate with each other.
 - LMR is deployed wherever organizations need to have instant communication between geographically dispersed and mobile personnel.
 - Typical LMR system users are public safety organizations (ex: police departments, fire departments, etc).
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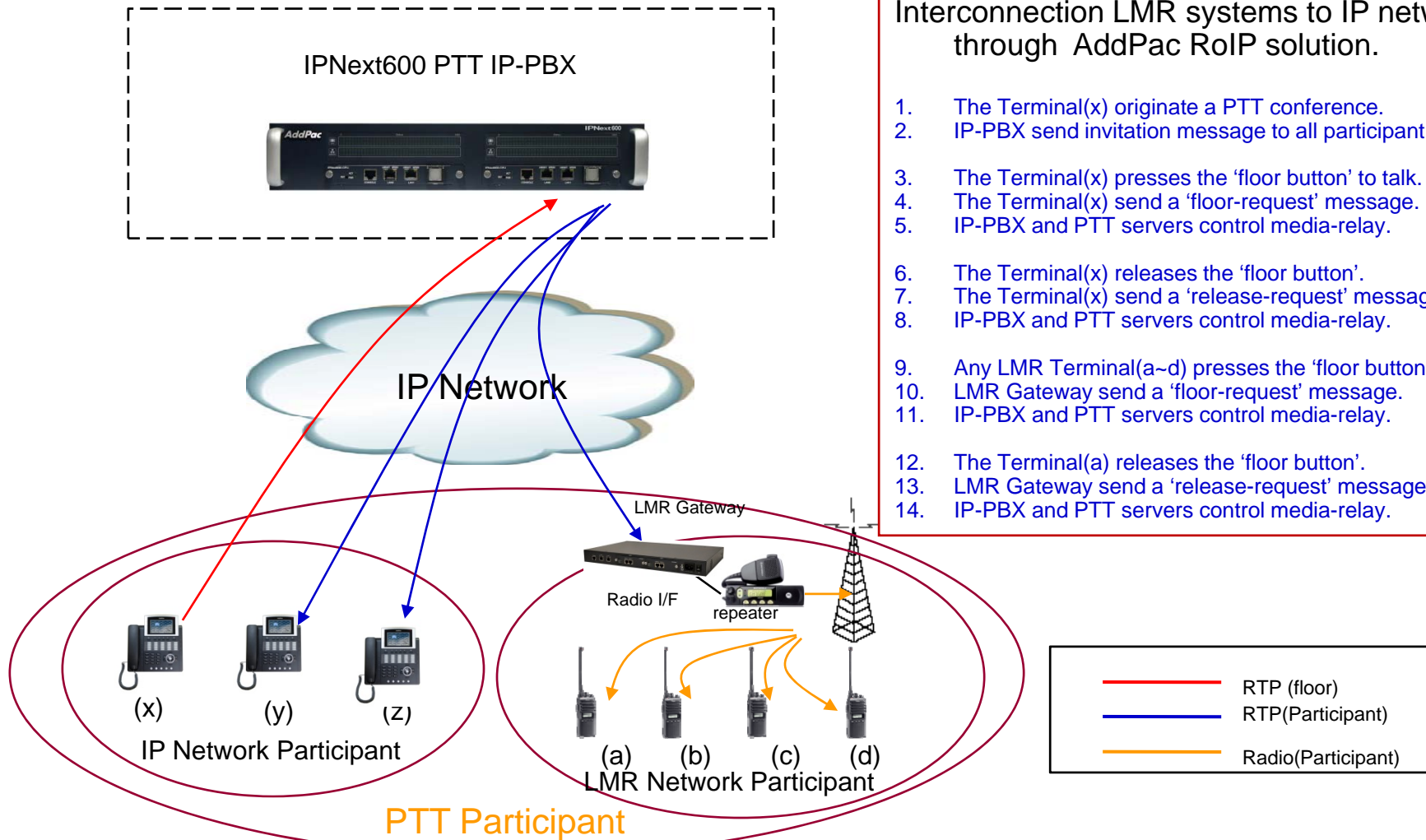
LMR Service

AP-LMR2000 LMR Gateway

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LMR Service Examples

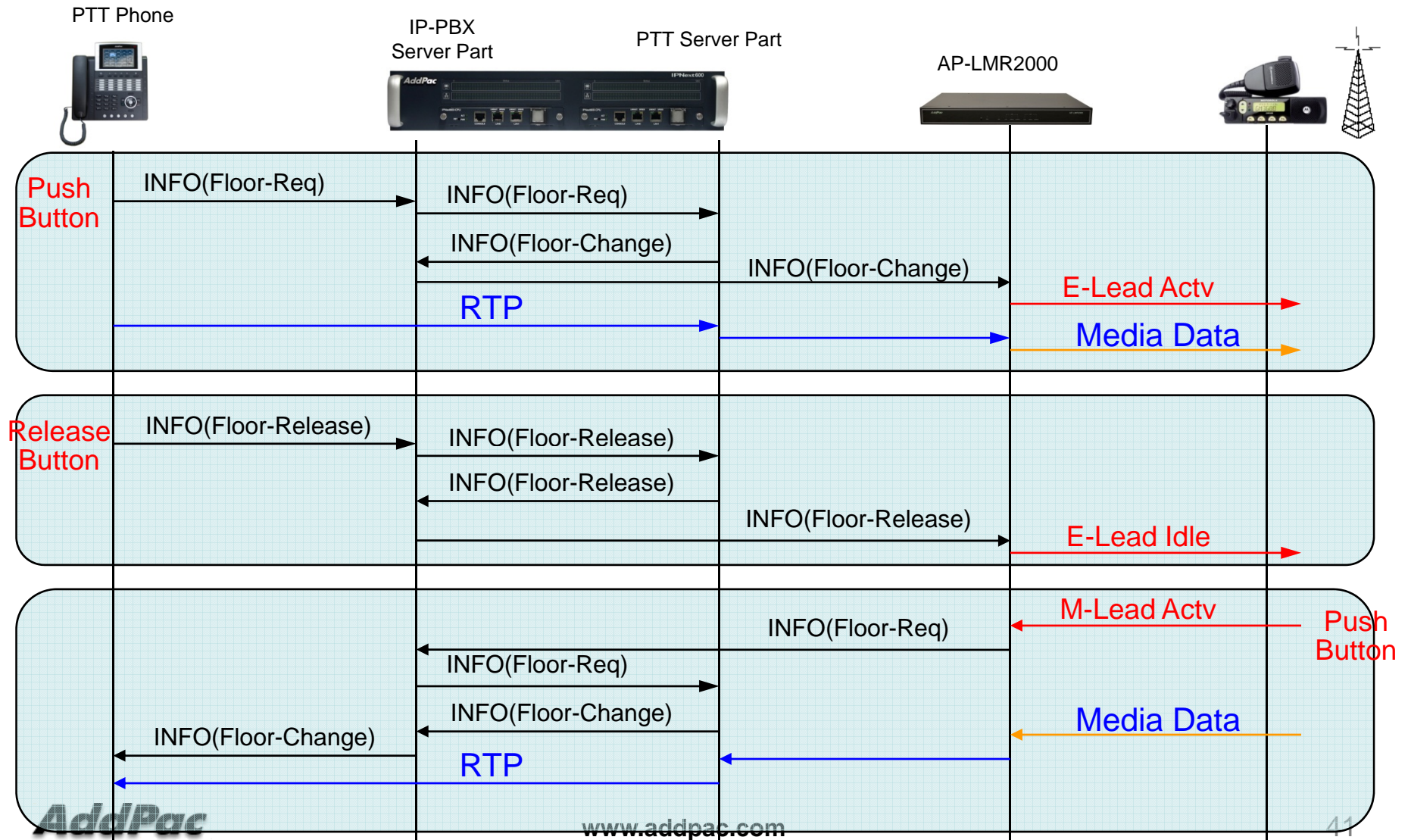
AP-LMR2000 LMR Gateway



- Interconnection LMR systems to IP network through AddPac RoIP solution.
1. The Terminal(x) originate a PTT conference.
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 3. The Terminal(x) presses the 'floor button' to talk.
 4. The Terminal(x) send a 'floor-request' message.
 5. IP-PBX and PTT servers control media-relay.
 6. The Terminal(x) releases the 'floor button'.
 7. The Terminal(x) send a 'release-request' message.
 8. IP-PBX and PTT servers control media-relay.
 9. Any LMR Terminal(a~d) presses the 'floor button' to talk.
 10. LMR Gateway send a 'floor-request' message.
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 12. The Terminal(a) releases the 'floor button'.
 13. LMR Gateway send a 'release-request' message.
 14. IP-PBX and PTT servers control media-relay.

RoIP System Message Flow

AP-LMR2000 LMR Gateway





WSMM Configuration for Paging Group
(WSMM : Web based Smart Multimedia Manager)
: AddPac IP-PBX Solution

Extension – Paging Group

Smart Multimedia Manager
www.addpac.com

Extensions

Modify	Delete	User Portal	Extension Number	Type	Name	Date Created
1			1000	User Extension	Ashley Allen	2015-07-28 12:39:51
2			1001	User Extension	Mary Moore	2015-07-28 12:39:55
3			1002	User Extension	Thomas Taylor	2015-07-28 12:40:00
4			1003	User Extension	Victoria Valdez	2015-07-28 12:40:04
5			1004	User Extension	Olivia Ortiz	2015-07-28 12:40:08
6			1005	User Extension	Linda Lewis	2015-07-28 12:40:12
7			1006	User Extension	George Sale	2015-07-28 12:40:17
8			1007	User Extension	Isabel Irwin	2015-07-28 12:40:21
9			1008	User Extension	William Watson	2015-07-28 12:40:25
10			1009	User Extension	Sarah Scott	2015-07-28 12:40:30
11			1010	User Extension	Nicolas Nelson	2015-07-28 12:40:34
12			1011	User Extension	Emma Evans	2015-07-28 12:40:38
13			1012	User Extension	Rachel Ross	2015-07-28 12:40:43
14			1013	User Extension	Henry Holt	2015-07-28 12:40:47

Add a Paging Group

Extension * (2~12 digits)

Name *

Audio Codec

Play beep at start

Play Announcement

Extensions

Extension	Name
<input type="text"/>	<input type="text"/>

Paging Group Members

Name	Extension	Display Name	Multicast
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Paging Group

Group Members

Getting Started
Clustering Guide
Partitioning Guide
Linked in
facebook
YouTube

IVR Extension
An IVR (Interactive Voice Response) extension has a type of auto attendant for incoming calls from trunks. If incoming calls from trunk are routed to an IVR extension by incoming call rule, the interactive scenario will be proceed to transfer the call to a proper user extension.

Push-to-Talk Group
A PTT (Push to Talk) group has members of user extensions who will receive broadcasting announcement with auto answering and also can be used for speaker phone. This is full-duplex two-way broadcasting.

Paging Group
A paging group has members of user extensions who will receive broadcasting announcement with auto answering by speaker phone. This is half-duplex one-way broadcasting.

Paging Group
A paging group has members of user extensions who will receive broadcasting announcement with auto answering by speaker phone. This is half-duplex one-way broadcasting.

Paging Group Configuration

Smart Multimedia Manager
www.addpac.com

Add a Paging Group

Extension * 9000 (2~12 digits) Check Extension Extension number is valid.

Name *

Audio Codec G.711U

Play beep at start Beep Sound 3

Play Announcement

Group Members

Name	Extension
Ashley Allen	1000
Mary Moore	1001
Isabel Irwin	1007
William Watson	1008
Sarah Scott	1009
Nicolas Nelson	1010
Emma Evans	1011
Georgel Davis	1012

Paging Group Members

Name	Extension	Display Name	Multicast
Thomas Taylor	1002		Off
Victoria Valdez	1003		Off
Olivia Ortiz	1004		Off
Linda Lewis	1005		Off
George Gale	1006		Off

Authorized Members

Name	Extension	Display Name	Multicast
Ashley Allen	1000		Off
Mary Moore	1001		Off

Play Announcement Configuration

Play Announcement

Announcement Closing Notification

Repeat Count 1

Retry Count 2

Retry Interval 3 sec

Close on Caller Drop Call



Thank you!

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