



# Cisco Unified Communications Manager Express – 7921 Push-to-talk

Application Note

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## Revision History

Revision	Date	Author	Comments
1	03/29/2007	Tony Huynh	Version 1.0

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# 1 Introduction

The following document outlines a solution utilizing Cisco Unified Communications Manager Express (CME), 7921G IP Phone, and Cisco Wireless Access Point (AP) to enable Push-to-talk functionality. By utilizing the Push-to-talk functionality available on the 7921G IP Phones, customers can use the 7921 phone to quickly call a set of pre-defined stations – thus enabling single click speech capability.

## 1.1 Objective

The objective of this application note is to educate Systems Engineers (SEs) on how to set up a CME system and configure the 7921 IP Phone to support the Push-to-talk feature.

## 1.2 Scope

This application note provides the configuration instructions necessary to configure a CME system, 7921 IP phone as well as basic instructions on how to configure a Wireless AP.

## 1.3 Audience

This document is targeted at Cisco SEs and other personnel who assist in pre-sales design of SMB voice solutions.

## 2 Overview

The solution provides general Push-to-talk (PTT) capability using the 7921G IP Phone with Cisco Communications Manager Express. The PTT feature utilizes an intercom button that is configured on the 7921 phone – the intercom button is configured to ring a pre-defined paging extension number when the PTT button is pressed on the 7921G IP Phone. This functionality can be used by customers who wish to utilize the PTT feature of the 7921G phone in order to quickly call an IP Phone, a paging group or intercom handset. Some practical uses for this functionality would be a mobile user who needs to quickly call a set of intercoms or provide an important announcement to a group of stations.

### 2.1 Requirements

General familiarity with Cisco CME, IP Phones, and Wireless APs is required. This document focuses specifically on the configuration of CME and 7921 IP Phone Push-to-talk functionality.

### 2.2 Components Used

The information in this document is based on these software and hardware versions:

- A Cisco 2801 router running Cisco CME 4.2
- Cisco IOS Release 12.4(11)XW
- IP Voice Cisco IOS feature set
- 7921 IP Phone, with minimum firmware of 1.0.1
- Wireless AP

The information presented in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

## 3 Deployment Model & Configuration

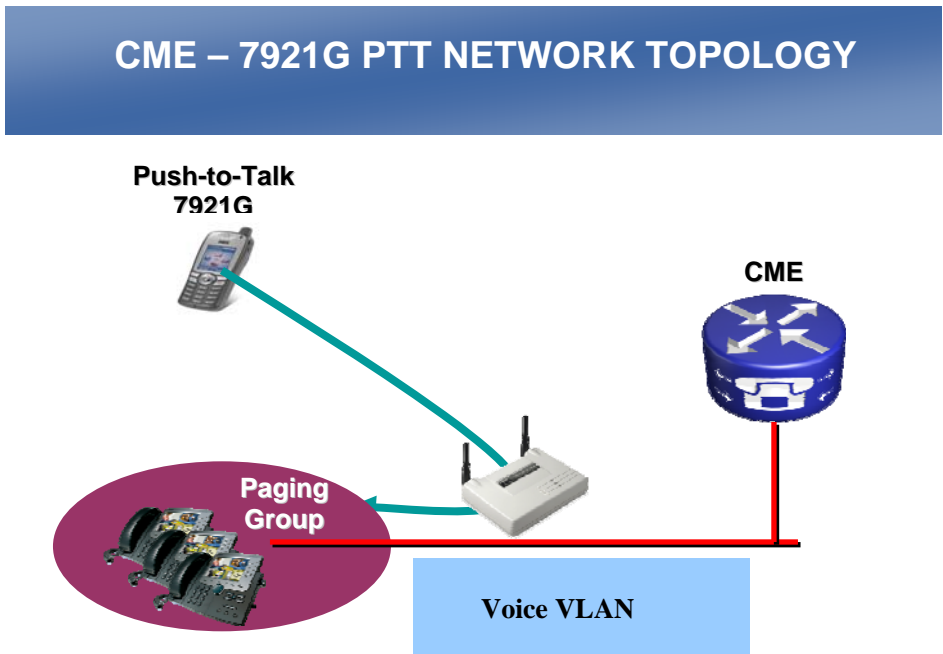
In this section, you are presented with the information to configure the solution described in this application note.

### 3.1 Network Diagram

This document uses the network setup shown in the diagram below. The configuration scenario has the following characteristics.

- Single site Cisco CME system
- The site defines 4-digit extensions and 10-digit dialing plan with IP Phone extensions in the 7501 – 7505 range, non-phone extension ( paging group) DN as 3999. The 10-digit numbers representing these same extensions are 408-434-XXXX.
- 4 x 7970 IP Phones are defined, extensions 7501 – 7504
- 1 x 7921G IP Phone with extension 7505

Figure 2 – Network Diagram



### 3.2 IP Addressing Scheme

The devices in this network use the following IP address scheme.

- **Voice VLAN - 100:** 10.10.10.0/24
- **Data VLAN – 200:** 192.168.10.0/24
- Wireless AP: Uses DHCP to obtain IP address

### 3.3 Communications Manager Express config

The following section provides configuration instructions for setting up the Communications Manager Express system according to the schema mentioned above – it will cover IP Phone configuration, paging configuration, as well as PTT phone service configuration.

#### 3.3.1 DHCP Scope config

DHCP will be used to hand out IP Addresses to the Wireless AP and IP Phones

```
DHCP Configuration
!
ip dhcp excluded-address 10.10.10.1 10.10.10.10
ip dhcp excluded-address 192.168.10.1 192.168.10.10
!
ip dhcp pool phone
  network 10.10.10.0 255.255.255.0
  default-router 10.10.10.1
  option 150 ip 10.10.10.1
!
ip dhcp pool data
  network 192.168.10.0 255.255.255.0
  default-router 192.168.10.1
```

**Network for voice devices**  
**Default router for devices in this network**  
**TFTP server ip address**

### 3.3.2 IP Phone config & Paging Group config

The following section provides the configuration for the IP Phone

IP Phone Config & Paging Group Configuration	
!	
ephone-dn 1 dual-line	
number 7501 secondary 4084347501	
name Gail Erickson	
!	
ephone-dn 2 dual-line	
number 7502 secondary 4084347502	
name Allen Brewer	
!	
ephone-dn 3 dual-line	
number 7503 secondary 4084347503	
name John Brown	
!	
ephone-dn 4 dual-line	
number 7504 secondary 4084347504	
name Wally Walker	
!	
ephone-dn 5 dual-line	
number 7505 secondary 4084347505	
name Tony Huynh	
!	
ephone-dn 6	
number 3999	<b>Configure paging extension number</b>
name IP-Paging1	
paging ip 239.1.1.1 port 2000	<b>Configure this paging-dn for multicast paging</b>
!	
ephone-dn 7	
number 3998	
intercom 3999 label "intercom PTT"	<b>Configure this intercom to ring extension 3999</b>
!	
ephone 1	
mac-address 0017.E035.4FD0	
paging-dn 6	<b>Add paging-dn 6 to ephone</b>
type 7970	
button 1:1	
!	
ephone 2	
mac-address 000F.23FC.A69D	
paging-dn 6	<b>Add paging-dn 6 to ephone</b>
type 7970	
button 1:2	
!	
ephone 3	
mac-address 0016.9DEF.199C	
paging-dn 6	<b>Add paging-dn 6 to ephone</b>
type 7961	
button 1:3	
!	
ephone 4	
mac-address 001A.6C9D.44AB	
paging-dn 6	<b>Add paging-dn 6 to ephone</b>

```

type 7970
button 1:4
!
ephone 5
mac-address 0009.3702.20E8
type 7921
button 1:5 2:7
!

```

**Add the intercom ephone-dn to the second button on ephone 5**

### 3.3.3 Push-to-talk Phone Service Configuration

The following configuration needs to be added on CME to define the Push-to-talk service for the 7921G IP Phone.

#### Push-to-Talk Configuration

```

telephony-service
load 7921 CP7921G-1.0.1
max-ephones 24
max-dn 72
ip source-address 10.10.10.1 port 2000
service phone thumbButton1 PTTH2 Map PTT button to button #2 on phone
system message CME-7921-PTT
call-forward pattern .T
moh music-on-hold.au
web admin system name cisco password cisco
transfer-system local-consult
transfer-pattern 9.T
transfer-pattern .T
!

```

NOTES: The general format for the push to talk configuration is:

```

telephony-service
  service phone thumbButton1 PTTH<1-6>
ephone-template 1
  service phone thumbButton1 PTTH<1-6>

```

- Where <1-6> is the button on the 7921 with an intercom dn targeting a paging number.
- Can be configured globally (under telephony-service) or locally (under an ephone-template which is applied to a specific 7921 ephone or set of ephones).
- After configuring this, perform a 'create cnf-files' under telephony-service and reset the 7921.

After you add the configuration above, perform “create cnf” to update the config files for the phones. Next perform the following command to verify that the push-to-talk service url is correctly populated in the 7921 config XML file.

```

CME-PTT-7921#more system:/its/XMLDefault7921.cnf.xml
<device>
<versionStamp>{7921 May 13 2008 09:33:00}</versionStamp>
.
.
<proxyServerURL></proxyServerURL>
<thumbButton1>PTTH2</thumbButton1> // PTT thumb button mapped to button 2
</vendorConfig>
</device>

```

After all this is completed, reboot the 7921 phone so that it picks up its new config file.

### 3.4 Wireless Access Point Config and 7921G IP Phone config

The following section provides instructions for setting up a Cisco AP to work with a 7921G IP Phone. For this application note, a Cisco 8 port POE switch installed in a 2801 was used. If an external switch is used instead of the onboard 8 port POE switch, then extra configuration on the switch will be required.

#### 3.4.1 Wireless AP Config

In the following configuration, the Cisco Wireless AP is connected to port FastEthernet0/3/4 and the Web server is connected to port FastEthernet0/3/5. The Cisco Wireless AP is configured to receive its IP address via DHCP is configured with SSID **nlo20**.

2801 VLAN configuration	Cisco Wireless AP
<pre> ! interface FastEthernet0/1 ip address 100.100.100.2 255.255.255.0 duplex auto speed auto ! interface FastEthernet0/3/0 description Phone1 switchport trunk native vlan 200 switchport mode trunk switchport voice vlan 100 spanning-tree portfast ! interface FastEthernet0/3/1 description Phone2 switchport trunk native vlan 200 switchport mode trunk switchport voice vlan 100 spanning-tree portfast ! interface FastEthernet0/3/2 Phone3 switchport trunk native vlan 200 switchport mode trunk switchport voice vlan 100 spanning-tree portfast ! interface FastEthernet0/3/3 Phone4 switchport trunk native vlan 200 switchport mode trunk switchport voice vlan 100 spanning-tree portfast ! interface FastEthernet0/3/4 description Cisco Wireless AP switchport access vlan 100 ! </pre>	<pre> Cisco-Wireless-AP#sh run Building configuration...  Current configuration : 1323 bytes ! version 12.3 no service pad service timestamps debug datetime msec service timestamps log datetime msec service password-encryption ! hostname Cisco-Wireless-AP ! enable password 7 cisco ! ip subnet-zero ! ! no aaa new-model ! ! dot11 ssid nlo20  authentication open  guest-mode ! ! bridge irb ! ! interface Dot11Radio0 no ip address no ip route-cache ! ssid nlo20 ! speed basic-1.0 basic-2.0 basic-5.5 6.0 9.0 basic-11.0 12.0 18.0 24.0 36.0 48.0 54.0 no power client local </pre>



<pre> interface FastEthernet0/3/5 switchport access vlan 200 spanning-tree portfast ! interface FastEthernet0/3/6 switchport access vlan 200 spanning-tree portfast ! interface FastEthernet0/3/7 switchport access vlan 200 spanning-tree portfast ! interface FastEthernet0/3/8 switchport trunk native vlan 200 switchport mode trunk switchport voice vlan 100 spanning-tree portfast ! ! <b>interface Vlan100</b> <b>description ** Voice VLAN **</b> <b>ip address 10.10.10.1 255.255.255.0</b> ! <b>interface Vlan200</b> <b>description ** Data VLAN **</b> <b>ip address 192.168.10.1 255.255.255.0</b> ! </pre>	<pre> power local cck 1 power local ofdm 1 station-role root bridge-group 1 bridge-group 1 subscriber-loop-control bridge-group 1 block-unknown-source no bridge-group 1 source-learning no bridge-group 1 unicast-flooding bridge-group 1 spanning-disabled ! interface FastEthernet0 no ip address no ip route-cache duplex auto speed auto <b>bridge-group 1</b> no bridge-group 1 source-learning bridge-group 1 spanning-disabled hold-queue 160 in ! <b>interface BVI1</b> <b>ip address dhcp client-id FastEthernet0</b> <b>no ip route-cache</b> ! ip http server no ip http secure-server ! ! control-plane ! bridge 1 route ip ! ! line con 0 privilege level 15 line vty 0 4 login local ! end  Cisco-Wireless-AP# </pre>
---	--

Configure Wireless AP to get IP Address via DHCP

### 3.4.2 7921 IP Phone config

In the following section, instructions will be provided on how to configure the 7921G IP phone. The first thing you will need to do is access the configuration menu.

- (1) The Cisco Unified Wireless IP Phone 7921G can be configured via one of two methods:
  - a. Manually
    - Using the keypad on the phone (\*\*# to unlock)

If you are using the manual configuration method, refer to the following link and populate the correct parameters.

[http://www.cisco.com/en/US/products/hw/phones/ps379/products\\_administration\\_guide\\_chapter09186a008079b4ce.html](http://www.cisco.com/en/US/products/hw/phones/ps379/products_administration_guide_chapter09186a008079b4ce.html)

b. Web Interface

- The phone has an HTTPS enabled interface that can be accessed via the 802.11a/b/g radio or USB
- If using USB, must statically set an IP on the computer side (i.e. 192.168.1.X /24)
- The 7921G USB is statically set to 192.168.1.100 /24 by default.
- Web username = Admin and default password = Cisco

(2) You will need to configure the following parameters when configuring a Network Profile

- a. SSID
- b. 802.11 mode
- c. Authentication / Encryption type
- d. Username and Password if using 802.1x
- e. WEP keys if using static WEP
- f. Pre-Shared key if using WPA-PSK
- g. Power Save Mode (for on call)

**NOTE:** In this application note, the SSID used was **nlo20**. In each individual setup, make sure that you configure the SSID on the IP Phone to match the SSID on the Wireless AP.

## 4 References

1. Cisco Unified Wireless IP Phone 7921G

[http://www.cisco.com/en/US/products/hw/phones/ps379/products\\_data\\_sheet0900aecd805e315d.html](http://www.cisco.com/en/US/products/hw/phones/ps379/products_data_sheet0900aecd805e315d.html)

[http://www.cisco.com/univercd/cc/td/doc/product/voice/c\\_ipphon/english/wip7921/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/wip7921/index.htm)

[http://www.cisco.com/univercd/cc/td/doc/product/voice/c\\_ipphon/english/wip7921/admn7921/7921cfgu.htm#](http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/wip7921/admn7921/7921cfgu.htm#)

2. Cisco Communications Manager Express documentation

[http://www.cisco.com/univercd/cc/td/doc/product/access/ip\\_ph/ip\\_ks/itscdc/itsph.htm](http://www.cisco.com/univercd/cc/td/doc/product/access/ip_ph/ip_ks/itscdc/itsph.htm)

[http://www.cisco.com/en/US/products/sw/voicew/ps4625/products\\_configuration\\_guide\\_book09186a00807c5776.html](http://www.cisco.com/en/US/products/sw/voicew/ps4625/products_configuration_guide_book09186a00807c5776.html)

3. Cisco Wireless Access Point

<http://www.cisco.com/univercd/cc/td/doc/product/wireless/index.htm>