

Push-to-Talk Over Cellular (PoC)

WHITE PAPER



Deploy a Nationwide Radio Communications Network with Push-to-Talk over Cellular

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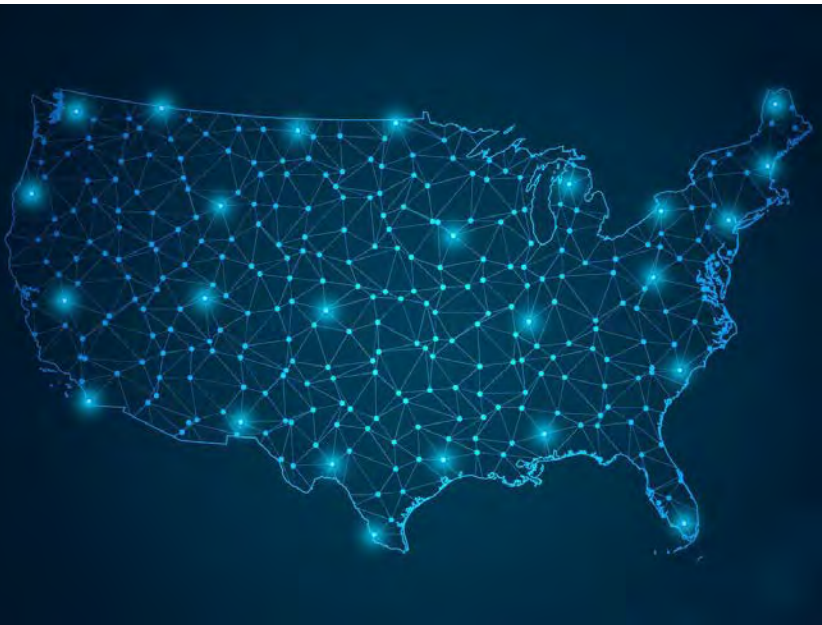
PUSH-TO-TALK OVER CELLULAR (POC) OVERVIEW

What is PoC?

Push-to-Talk over Cellular (PoC) provides two-way radio services over 3G, 4G, and LTE technology, creating a nationwide radio network that utilizes the cellular infrastructure of Mobile Network Operators. This enables radio networks with very wide coverage areas. Radio users are untethered by the range of repeaters and base stations used in traditional radio networks.

PoC utilizes the LTE cellular infrastructure of Mobile Network Operators, creating a wide-area radio network that provides national coverage with the bandwidth for data and video applications.

The concept of Push-to-Talk over Cellular was introduced by Nextel in 1987 as an alternative to two-way radios. Nextel revolutionized business communication when it started to pass small voice packets from radios across their iDEN network. Prior to cellular push-to-talk, business communication was dominated by two-way radios on peer-to-peer and local radio networks. Nextel was acquired by Sprint, and in 2013 Sprint decommissioned the Nextel iDEN network because it could not support modern LTE data and video bandwidth requirements.



Today, PoC provides the best of both narrowband digital radios and broadband LTE networks. PoC radios support the advanced features of Digital Mobile Radios (DMR), including messaging, instant group calling, GPS location tracking, and emergency notifications. Combining this functionality with LTE cellular networks provides the bandwidth required for modern data, photo, and video applications, along with the national coverage area of 4G/LTE.

How PoC Works



PoC devices connect to the cellular infrastructure networks of Mobile Network Operators, using a SIM card identical to those installed in cell phones. PoC network services are hosted in the Cloud. The Cloud services are located on privately hosted servers owned and operated by the PoC platform. Gateway routers provide connectivity between the MNO networks and the PoC servers.

The advantage is a highly reliable network that requires no maintenance (which requires operational expenses technicians). An app on the radio (typically an Android operating system) provides simple and convenient access to PoC services.

PoC Radios also support Wi-Fi connectivity. The Wi-Fi capability enables calls inside buildings with Wi-Fi network connectivity, or with Wi-Fi network hotspots that fill gaps in an LTE network with limited connectivity. PoC radios automatically and seamlessly switch to an LTE network when a caller moves outside Wi-Fi network range.

PoC Market Growth

Growth in PoC services is being driven not just by the technology, but also by the increase in mobile workforces, and the global adoption of the Internet of Things (IoT). There is proven demand for PoC services. At its peak, Nextel had over twenty million subscribers in the United States.

According to Persistence Market Research, the PoC market will grow at a Compound Annual Growth Rate (CAGR) of 9.7% from 2019 to 2029; with the market value increasing from \$3.2 billion to \$10 billion over the next 10 years. The fastest growth will take place in the Services Segment, which includes transportation, hospitality, and mobile workforces like security guards, electricians and plumbers.

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Who Uses PoC?

Industries which use PoC services are looking for wide-area communications with a low startup cost. These industries include transportation and logistics, retail, security, construction, local government organizations, hospitality, manufacturing and others.

PoC is particularly useful for businesses needing to communicate across widely dispersed sites or with mobile work forces, such as service companies with vehicle fleets and logistics firms. These are companies with service fleets and multiple locations that don't want to invest capital in the infrastructure required for wide-area radio networks.

- Security Guards
- Property Management
- Retail
- Hospitality
- Electricians, Plumbers and Exterminators
- Construction and Building Materials
- Bus and Transportation
- Waste Management
- Food Distribution and Delivery Services
- Large Event Production Companies



PoC also provides a cost-effective solution for smaller organizations, such as retail outlets or hospitality, where traditional Land Mobile Radio (LMR) solutions might be more than is required or too high of an investment.

OPEX vs CAPEX Model

Traditional wide-area private radio networks require significant up-front Capital Expenditures (CAPEX), that include base stations, repeaters, routers, and antennas. PoC is based on Operational Expenditures (OPEX) with a low-cost, subscription-based service. The only up-front investment is the PoC radios and SIM cards.

PoC Radios vs. Phones

Employees can use personal cell phones, company issued cell phones, or PoC radios for internal company business communication. Providing an employee with a dedicated PoC device ensures employees use the devices exclusively for business-related communications.

There are several advantages to PoC radios:

- Provides instant group calls and individual calls
- Higher volume for using in noisy environments
- Provides a dedicated, purpose-built device for professional communications
- Provides one touch emergency alarms
- Car kits are available for in-vehicle use
- No looking up contacts or dialing a long phone number
- No waiting for the 'phone to ring' to be answered
- No apps to launch to speak

There are several drawbacks to cell phones:

- No group calling
- Cell phones services are much more expensive than PoC subscriptions
- Cell phones enable employees to waste time on social media, games, and calling and texting friends
- Cell phones do not support advanced radio features like noise suppression for talking in loud environments, Man Down notification, and remote shut off.



PoC Radios vs. Traditional Two-Way Radios

Two-way radios are limited in range, and the radio coverage is dependent upon investment in infrastructure equipment like repeaters, power supplies, antenna, hi-site site rental and in securing an FCC license. This can be expensive to purchase and maintain.

PoC leverages existing cellular and Wi-Fi networks, providing instant nationwide communications, without having to spend on infrastructure. However, if there is already a significant investment in a radio communications system, PoC can be deployed in an integrated hybrid solution that enables existing radios to be connected to PoC radios and devices.



POC FEATURES AND BENEFITS

Nationwide Coverage

PoC leverages 3G/4G/LTE and Wi-Fi networks to provide a secure, instant, and nationwide communications solution for today's mobile workforce.

No Infrastructure Required

Another major benefit with PoC is that the customer no longer needs to purchase, operate and maintain any infrastructure, as this is all done by the Mobile Network Operators. This gets rid of the day-to-day responsibilities of owning and maintaining the infrastructure, reduces operating costs and dispenses with the need for frequency licenses for private LMR systems.

Rapid Deployments

Since the radio network infrastructure already exists, PoC systems can be deployed very quickly. PoC radios can work out-of-the-box with SIM cards pre-installed, and system configuration such as call groups, emergency alarms, and geo fencing can be easily done through a web-based dispatch application.

Unlimited Bandwidth

Unlike LMR networks where channel capacity is finite, PoC platforms allow any number of virtual channels and as many call groups as required to be created, including the ability to create dynamic call groups. LTE networks also support bandwidth-hungry applications like video streaming.

Push-to-Talk Individual and Group Calling

PoC technology enables subscribers to make one-to-one (individual) calls or one-to-many (group) calls to different groups of people at the same time over a mobile operator's network. One press of a button on a rugged handheld device and you are talking to your group or an individual.

GPS Location Tracking

PoC devices with integrated GPS enable location tracking via a dispatcher. This is an essential tool for managing, scheduling, and tracking remote teams. PoC dispatch applications that support Geo Fencing enable alarm triggers when employees enter hazardous areas, or when remote service employees stray from defined territories. Dispatchers are typically web-based applications allowing for easy deployments and minimal start-up costs.

PoC DEVICES AND SOFTWARE APPLICATIONS

Hytera HALO is a complete end-to-end PoC solution that includes PoC network access, radios, bodycams, management platform, and dispatch application.



Hytera HALO also supports Bring Your Own Device (BYOD) cell phones with the appropriate app installed, providing flexibility for users who may also need cellular access.

Hytera PoC Radios

The Hytera [PNC370 PoC Radio](#) is a compact, rugged, and easy-to-operate LTE handheld radio. The PNC370 enables fast voice communication and data transmission with a nearly limitless connection over nationwide LTE cellular networks.

- Sleek, compact and durable devices designed specifically for business PoC communications
- Digital noise suppression and high-volume speakers for excellent voice quality in loud environments
- Full-duplex individual calls
- Built-in Wi-Fi Enables connectivity to Wi-Fi networks, and automatically switches over to the LTE network when out of Wi-Fi range
- Built-in Bluetooth supports wireless connection with audio accessories for improved efficiency and hands-free operation
- High-power flashlight
- GPS enables tracking and positioning for the dispatching application and Real Time Clock for displaying call history
- IP55 rated for dust and moisture resistance
- Meets MIL-STD-810 G standards for shock and vibration resistance
- Pre-installed HALO Android app for simple and convenient access to PoC services
- Supports individual or group texting
- Powerful battery provides up to eighteen hours of operation
- Other advanced PoC radio features include Lone Worker monitoring and alarms, remote (by dispatcher) over-the-air stun or kill of devices, full call recording, logging and playback services



Hytera PoC Body Worn Cameras

The [Hytera VM780 Body Worn Camera](#) integrates a body camera with Push-to-Talk over Cellular (PoC) voice communications to capture, store, and share video, audio, and image evidence in the field. The VM780 features video transfer, evidence collection, and dispatching software applications.

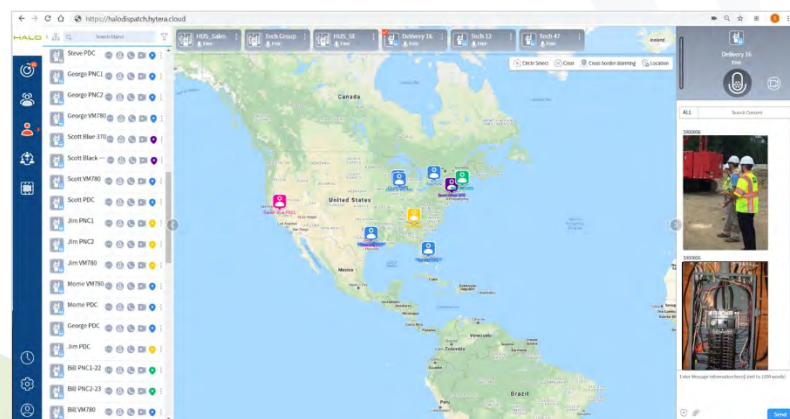
- All-in-one design reduces equipment costs and simplifies communications
- Full duplex voice and video calling
- Video conferencing
- 2.8-inch touch display
- HD 1080P video recording with AES256 advanced encryption
- Stream video over 4G/LTE or Wi-Fi networks for nationwide monitoring of events
- GPS built-in and Hytera HALO Dispatch application compatibility
- Supports individual and group calls between dispatch, VM780, and other POC devices Real-Time
- IP67 and MIL-STD-810G rated
- Powerful battery life supporting up to nine hours continuous recording



Hytera HALO Dispatch Application

Hytera HALO includes a powerful dispatch and fleet management application that provides tracking of driver locations and travel routes with time stamps. The dispatch application works with the GPS integrated into the PNC370 radios and VM780 bodycams and supports geofencing capabilities.

HALO Dispatch is available as a web-based application accessed through a web browser.



It supports instant group calling as well as individual calling. Dynamic call groups can be quickly created with a simple list selection or geographically by selecting an area on the dispatch map. The dispatcher may stun (turn off) and reactivate a radio, perform Lone Worker monitoring, receive emergency alarms, along with full call recording, logging and playback.

About Hytera

Since its founding in 1993, Hytera has established itself as a leading provider of comprehensive wireless communications solutions for the public safety, government, transportation, commercial, and industrial sectors. Hytera America offers a full suite of two-way radio products and communication solutions to meet any demand and budget.

- DMR Two-Way Radios
- Push-to-Talk over Cellular Radios and Bodycams
- Analog Two-Way Radios

Learn more about Hytera radios, repeaters and trunking systems at www.hytera.us in the USA, and www.hytera.ca in Canada



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