



Push-to-Talk COMMUNICATION

BY TY ESTES

Push-to-Talk Over Cellular (PoC) provides group and individual communication services over both Wi-Fi, 4G and Long Term Evolution (LTE) technology, creating a nationwide radio network. Radio users are untethered by the range of repeaters and base stations required for traditional radio networks.

PoC is also referred to as Radio over IP (RoIP). Similar to Voice over IP (VoIP), RoIP devices are portable two-way radios that access cloud-based PoC services via the internet for unlimited voice and video calling. A data plan SIM card—like those used in cell phones—is installed in the PoC device to enable access to the internet using the 4G/LTE cellular infrastructure of mobile network operators like AT&T, T-Mobile, and Verizon. PoC radios are also known as Internet of Things (IoT) devices that access the internet for data communications via Wi-Fi networks like any other mobile device.

This alphabet soup of terminology may be confusing, but simply put, PoC devices access

the internet through 4G/LTE cellular and Wi-Fi networks for wide-area radio communications. The result is access to existing and reliable networks that require no maintenance or operational infrastructure expenses. An app on the PoC device provides simple and convenient access to PoC services.

The Benefits of PoC

PoC provides the same group calling capabilities as traditional two-way radio systems, enabling instant group calls to multiple users with the press of a button on a handheld or mobile PoC radio or from a dispatching application. Call groups can be set up based on emergency call groups, employee job

functions (educator, maintenance, administration, security); people can belong to multiple groups if they are a manager or team lead.

PoC requires no FCC frequency licenses or traditional radio infrastructure. There is no need to purchase, operate, and maintain equipment such as repeaters and multiple antenna systems. PoC also eliminates the need for expensive FCC radio frequency licenses, which may not even be available in some high-density urban areas. PoC systems can be deployed very quickly over existing cellular and Wi-Fi networks, and they can work out-of-the-box with SIM cards pre-installed.

PoC systems include web-based dispatching applications that can be run on a web browser. Dispatch applications provide a comprehensive fleet dispatching and group calling visual interface for instant nationwide voice and video calling and GPS location tracking. Group calls can be made to pre-programmed groups, or dynamic call groups can be easily created by

selecting users from a list or grouping within an area on the dispatch map. Dispatch applications can track multiple user locations and travel routes with job site time stamps to manage and dispatch remote workers.

Subscription Based PoC Services

PoC radio services can be purchased on a subscription basis with low-cost annual plans that include rental PoC devices, or the PoC devices can be purchased and owned by subscribers. The subscription costs typically include the SIM card which has a monthly service fee from the mobile cellular operator to access the LTE network through the SIM data plan. The benefits of subscription based PoC services include the following:

- PoC subscription plans are very inexpensive and cost-effective
- This plan provides a monthly operating expenses cost model with minimal up-front costs and low monthly or annual payments

- This innovation offers the easiest and fastest way to get reliable wide-area radio communications
- Users make no investment in depreciating radio network infrastructure
- Users have no equipment to house, power, and maintain
- The system is easily scalable, with unlimited subscribers so can easily grow with the needs of the organization
- Users have flexible deployment options with Wi-Fi and LTE networks

Subscription Based PoC Application Example

When PoC devices on subscription plans access a cloud based PoC system using Wi-Fi and cellular 4G/LTE networks, the PoC devices on the Wi-Fi network are utilizing the existing wireless network infrastructure of a campus to access the cloud based PoC controller. These devices include PoC radios,

PoC mobile computers, and PoC bodycams. It is important to note that a Wi-Fi coverage survey should be conducted to ensure there is sufficient coverage for the devices to access the cloud based PoC controller anywhere on campus. Wi-Fi connectivity is optional and 4G/LTE coverage can be used if there is no high-quality Wi-Fi network available.

The PoC devices on the nationwide 4G/LTE network use SIM cards to access the mobile operator's cellular network with an Access Point Name (APN) that routes the data traffic to the internet gateway. The PoC devices on the 4G/LTE network include mobile PoC radios installed in vehicles, in addition to the same devices found on the Wi-Fi network. The PoC controller accesses the internet through the customer's network router. PoC subscriptions can also include a web-browser based dispatch application that accesses all the PoC devices on the system via the internet.

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Customer Owned PoC Systems

PoC radio systems can also be owned by the customer as a Capital Expenditure purchase. This designation allows the customer to make a single purchase payment for the PoC system without any recurring subscription costs. Customer-owned systems do require subscriptions for the SIM cards from the mobile cellular operator to access the LTE network through the SIM data plan.

PoC systems are typically available with entry-level or advanced PoC controllers. Entry-level systems provide very cost-effective PoC communications. They support Wi-Fi and 4G/LTE network access, group voice calling, text messaging, and a limited number of PoC devices (around two hundred users). Advanced PoC controllers add capabilities and functions such as dispatch applications, supporting video calls from PoC bodycams and other video capable PoC devices, in addition to supporting an unlimited number

of users. The benefits of customer-owned PoC Systems include the following:

- Customer owned PoC systems can have a lower total cost of ownership over several years compared to a PoC subscription plan
- Capital expenditure cost model with all costs up front in a single purchase and no monthly service payments
- Fast deployment of reliable wide-area radio communications
- Simple equipment installation of a PoC controller
- Scalable growth and flexible deployment options with Wi-Fi and LTE networks

Customer Owned PoC System Application Example

While similar to the subscription application example, this version shows the PoC controller residing on the customer premises

rather than in the cloud. This application has an advanced PoC controller that supports a dispatch application and video calls.

The PoC devices on the Wi-Fi network are utilizing the wireless network infrastructure of the campus to access the PoC controller. A Wi-Fi coverage survey is recommended to ensure there is sufficient coverage for the devices to access the PoC controller anywhere on campus. Wi-Fi connectivity at the facility is optional and 4G/LTE coverage can be used if there is no Wi-Fi network available.

The PoC devices on the nationwide 4G/LTE network use SIM cards to access the mobile operator's cellular network with an Access Point Name (APN) that routes the data traffic to the mobile operator's internet gateway. The PoC controller accesses the internet through the customer's network router.

Customer-owned PoC systems with a dispatch application typically require an

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additional dispatch controller. The dispatch web-browser-based application accesses the dispatch controller via the internet or a direct LAN connection.

PoC Devices

PoC devices include handheld radios, PoC mobile radios, PoC handheld smart devices, mobile computers, and PoC bodycams. These compact, rugged, and easy-to-operate handheld devices enable group voice and video communications over Wi-Fi and nationwide cellular 4G/LTE networks.

Key features of PoC devices:

- Digital noise suppression and high-volume speakers for excellent voice quality in loud environments
- Built-in Wi-Fi that automatically switches over to the LTE network when out of Wi-Fi range
- GPS enables tracking and positioning for the dispatching application

- Ruggedized to water and dust ingress protection ratings
- Supports individual or group texting
- Built-in Bluetooth supports wireless connection with audio accessories for hands-free operation
- Powerful batteries provide reliable operation over multiple shifts
- Multi-unit chargers available for most PoC devices
- Car kits are available for specific handheld PoC radios to provide safe and DOT approved use in vehicles
- PoC handheld smart devices run any Android business app for a true unified communications device
- PoC bodycams with integrated PoC radios reduces equipment costs and simplifies communications
- PoC devices and bodycams with cameras support user-initiated video calls

Summary

Push-to-Talk over Cellular and Wi-Fi technologies are enabling private universities to leverage the capabilities of advanced wide-area communications without the time and expense required to deploy traditional radio infrastructure. PoC technology, along with modern cellular and wireless networks, provides the flexibility, low cost, and wide-area coverage required for today's university operations and student safety.



ABOUT THE AUTHOR: Ty Estes is the Marketing Director for Hytera US Inc, where he oversees promotion of the company's radio communication products. Ty has over twenty years of experience in marketing wireless communications and network technologies, and he has chaired committees in telecommunications trade associations and authored several technical papers. Ty has a bachelor's degree in English from California State University, Long Beach.

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