

## Cloud Location over Cellular (C-LoC) Drives IoT Success in Home Healthcare Market

### IoT Brings Flexibility to Home Healthcare Market

The Internet of Things (IoT) has revolutionized many industries and will continue to impact our lives in ways we can't yet imagine. Entirely new categories of use cases are now possible through technology innovations that enable connected devices, which can use artificial intelligence and machine learning to enrich business outcomes and enhance consumer experiences.

Healthcare is one such industry that has changed dramatically with the advent of IoT. In the past, medical care was delivered via a healthcare professional at an office or in a hospital setting. Through the use of emerging technologies, patients can now choose to receive remote healthcare from their providers in the comfort of their home or as they travel.

In a January 2018 research study, Markets and Markets predicted the wearable medical devices market will reach \$14.41 billion by 2022, up from \$6.22 billion in 2017, at a CAGR of 18.3%. New

wearable medical devices allow freedom for patients, as well as security that their health status is being monitored and adjusted as needed with little effort on the part of the patient. This is a result of new technologies like Cloud Location over Cellular (C-LoC), which enables medical devices to connect to the 4G and 5G cellular networks automatically to send patient data in a highly secure environment.

With the arrival of IoT to the home healthcare market, location technologies are quickly proving to be the common denominator for success in many use cases. Providing an inexpensive, low power solution has been a challenge until C-LoC from Polte emerged. Using the cellular network and cloud computing through Polte's platform, manufacturers can now deliver IoT devices that are the least expensive, lowest power, most accurate and inherently secure.



**Moving healthcare away from hospitals reduces cost and often results in better patient outcomes**



**87%**  
**of healthcare organizations use IoT technology**

## DRIVERS OF INCREASING HOME HEALTHCARE

- Government proposal to promote home healthcare
- Rising aging population
- Increasing incidences of chronic diseases
- Technological advancements
- Growing healthcare costs
- Rising need for affordable treatment options

## C-LoC enables added functionality and mobility to medical devices

As healthcare moves away from traditional facilities and into the home, the need to keep track of expensive medical devices is increasingly important. Also, with the freedom of mobility comes the risk of theft or loss. As many medical devices are leased, having a way to locate a

device if it goes missing saves millions of dollars every year for device providers, patients and insurance companies. It also provides peace of mind for patients whose lives may depend on their devices reporting health states to their healthcare professionals.

## C-LoC Track and Trace Solution

Polte's track and trace C-LoC solution utilizes broadly deployed cellular networks. The Polte solution leverages small amounts of cellular tower data from 4G and 5G networks to determine location. The tower data is sent to the Polte Cloud where the location of the device is calculated. By using the Polte Cloud for all location computations, the device itself needs a very limited amount of power and processing capacity. This drives down the cost of the IoT solution while providing the inherent security of the cloud.

As cellular networks provide coverage both indoors and outdoors, medical devices and patients can be seamlessly tracked as they move from one environment to another. Polte software embedded in a cellular modem on the medical device connects automatically to the 4G and 5G

networks relieving patients of the worry in finding a wireless network and "pairing" their device each time they move.

Polte can relay not only location information, but other sensor data as well, including patient health status. In the Polte Cloud, location information is analyzed along with the other sensor data to provide actionable intelligence, insights and trends. Parameters or geofences can be set so when specific metrics are met, or a location boundary is breached, an action is triggered. For example, a notification could alert a healthcare provider if a patient's heartrate goes above a certain point or if a memory care patient has wandered past a predetermined boundary. Immediate steps could then be taken to remedy the situation quickly.

## HOME HEALTHCARE DEVICE AVERAGE COST

• Home respiratory therapy equipment	\$500 to \$3,000
• Home dialysis equipment	\$50,000
• Home IV equipment	\$250
• Home patient monitors	\$1,000 to \$2,000
• Telemedicine patient monitoring systems	\$2,000 to \$4,000
• Mobility assist equipment	\$2,000 to \$4,000
• Medical furniture, including beds, lifting chairs	\$500 to \$3,000
• Bathroom safety equipment	\$1,000 to \$2,000

## Common Location Technologies

GPS has long been the go-to solution to provide track and trace capabilities. GPS trackers access satellites orbiting earth 12,500 miles away to deliver the approximate location of an object. A GPS radio needs a clear line of sight to the satellite network in order to work, which requires considerable power, and users can expect a delay in getting location information that is not always accurate. GPS only works outdoors, so it's not ideal for use cases that need seamless indoor/outdoor location information.

Wi-Fi, Bluetooth and other radios can provide good location results, but only where networks are deployed and accessible. Those networks are

typically for indoor use, have limited range and are often proprietary. In the case of an open network, there is little security for the device. Because these technologies continuously scan for networks to connect, they tend to use significant battery power as well.

Widely deployed 4G and 5G networks provide the ideal location solution for the billions of IoT devices forecast over the next several years. Polte leverages these networks and its patented Cloud Location over Cellular technology to enable the lowest cost, lowest power, most secure location solution for IoT and mobile devices.

# The IoT Revolution in Healthcare

As increasingly more people elect for aging in place, the home healthcare market will continue to grow rapidly. Technology innovation allows them the flexibility to receive healthcare in their home or other remote locations with greater ease and often better patient outcomes.

IoT is enabling effortless solutions for remote patients that provide accurate, real time results. With the addition of location technologies to remote healthcare solutions, providers experience increased efficiencies that help drive revenue while customers enjoy a better experience.

## BENEFITS OF C-LoC

- **Single cellular radio is less costly than hybrid approaches**
- **Lower power requirements result in extended battery life**
- **Seamless indoor and outdoor coverage with no handoffs**
- **Smaller form factors**
- **Location data is inherently secure in the Polte Cloud**
- **High location accuracy**

## **POLTE** Positioning Technologies

Headquartered in Dallas, Texas, Polte is a software company that delivers the most accurate Cloud Location over Cellular (C-LoC) solution available. Leveraging 4G and 5G signals, Polte's cloud-based platform locates IoT and mobile devices seamless in real time as they move between indoor and outdoor environments.

By handing complex location computations from the device to the cloud, the Polte solution is more than 25-50 times more power efficient than GPS for initial fixes, and 3-10 times more accurate than

other cellular-based location solutions. Since calculations are done in the Polte Cloud, manufacturers can now deliver the lowest cost, lowest power, most secure and accurate location available.

Polte's software-only platform disrupts IoT economics by enabling millions of things not previously tracked to be easily and inexpensively located. With 74 global patents and patents pending, Polte enables an entirely new set of use cases for millions of IoT devices.