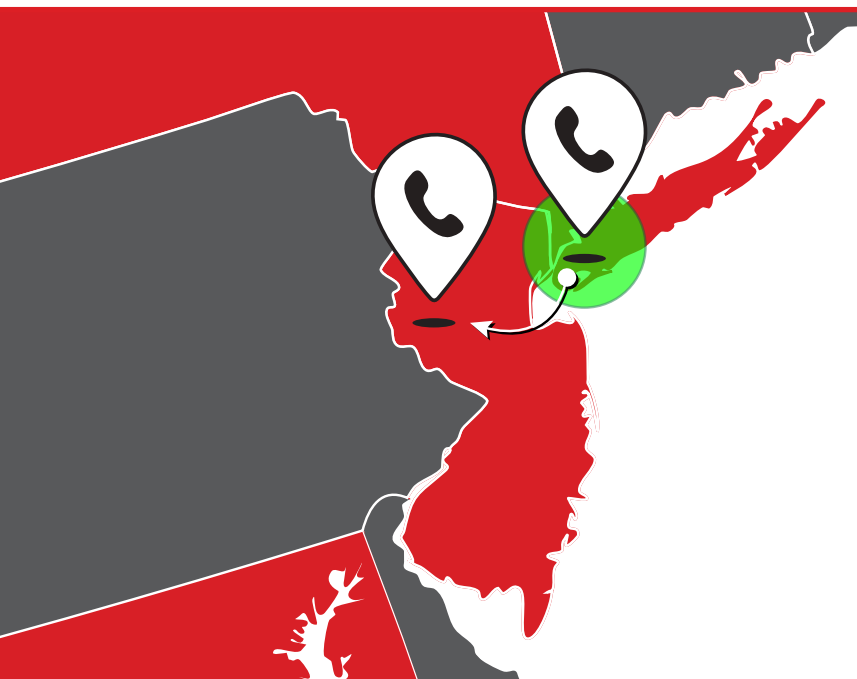


# DROP THE HEAVY LIFTING OF 9-1-1

## *How 911inform's LDS Carries the Weight*

In today's evolving enterprise environments, user mobility is everything. Remote workers are easily enabled and communications can now take place from almost anywhere, and on any device. With that, employees working from home have become the new normal. As an example, a user who has a wired phone at the office may also work remotely via their laptop and softphone. That user is now active in two separate locations, where both are using the same phone number and extension. This Multiple Device Access (MDA) capability creates a specific 9-1-1 location challenge that administrators must deal with to remain compliant with new Federal laws.

Public Safety Answering Points (PSAPs) are the local 9-1-1 call centers that receive emergency calls occurring within a specific geographic area. Across the US, these geographic areas can be defined in a multitude of different ways, all depending on their location. 80% of the 7000 centers are small agencies, serving a single city, or a single coverage area as large as a state (see Rhode Island). As Enterprise users can now work from both home and the office, they could (and will likely) cross the invisible boundaries of one PSAP to another without anyone being aware. In a scenario where a user has logged into a remote device or softphone at home and have not updated their location information, a 9-1-1 call would be routed to the PSAP that covers their work location, delaying response times. The inefficiency of E911 to provide dynamic location updates, and the high number of remote workers, is creating an environment more dangerous and requiring new NG911 solutions.



### **NEW YORK**

#### **Work Office - Wired Phone**

- Has wired office phone & logged in
- 9-1-1 call triggered from main wired office phone location

### **NEW JERSEY**

#### **Home Office - Softphone & Laptop**

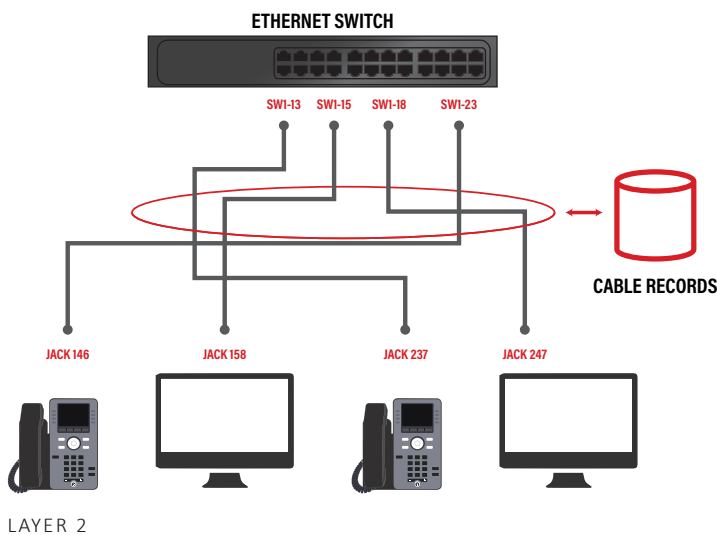
- Logged in remotely using softphone & laptop
- Now active in two locations under same phone number & extension
- Dials 9-1-1 without updating location information

# The Legacy E911 Solutions

For the past 20 years, existing solutions have attempted to solve the mobility/location dilemma by tracking the movement of devices. These solutions attempt to tie a device to a specific location and unique phone number. They also assume that the device will not move unless an administrator knows about it.

## Layer 2 Discovery

Tracking the location of VoIP phones to the desktop is accomplished by using the Layer 2 discovery method. With Layer 2 discovery, the connection to the physical data switch port is achieved, but the location reported is the physical switch port in the communications closet and not the location

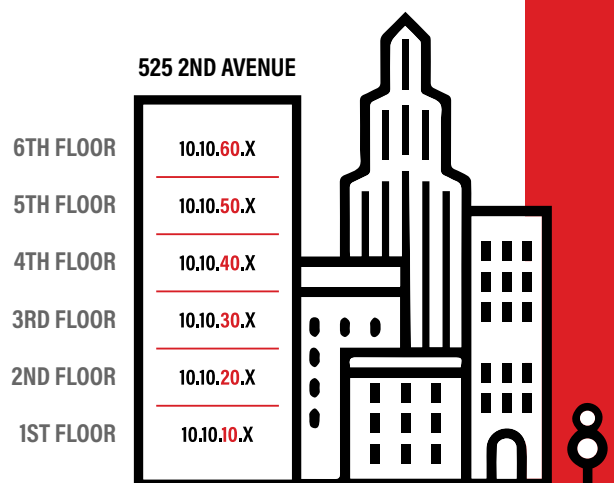


of the wall jack where the phone is located. In order to obtain that actual jack information, detailed cable records must be maintained of each patch cord in the data closet; and exactly what jack each switch port is connected to. Should a cable be moved, the accompanying cable record must then be manually updated with the new information. If the cable records are out of date, the associated location information will mislead internal and first responders which will delay a response. While this method can

provide very accurate location information, it requires a dedicated amount of manual intervention in order to accurately manage the cable plant records. In addition to these arduous record keeping requirements, unique DID (Direct Inward Dialing) numbers must also be assigned to each location and tracked, associating them to the 911 location record.

## Layer 3 Discovery

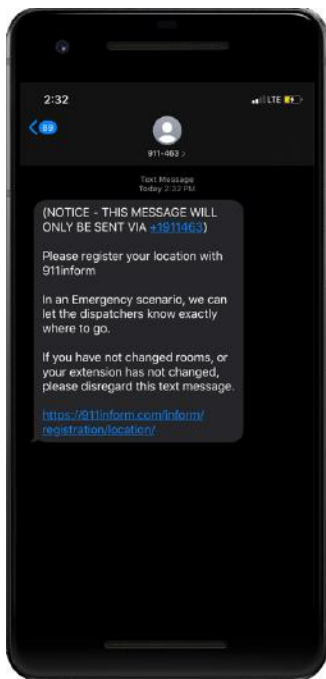
An alternative method of tracking the movement of VoIP phones is to associate MLTS phones to specific subnet ranges within a building. This is commonly referred to as Layer 3 discovery. This simply means that a network utilizes multiple subnets, or IP address ranges, and associates each range to a specific physical area. These Emergency Response Locations (ERLs) or “zones” of a building, designate the general area of the emergency. As phones register, their IP Address ties them to a specific subnet ERL. Each ERL is provisioned with the appropriate location and identification used by Public Safety to respond. This method works well, and in most cases maintains itself, however, issues can arise if the physical area of a subnet gets stretched beyond the defined zone. For example, if a cable from one subnet is connecting to a user located in a different subnet area, the logic is broken, and the incorrect information is then relayed to first responders. Plus being “zone” based, the granularity of reporting is to an area, not a specific location. While this method is very easily maintained, the granularity is compromised.



## 911inform LDS

In early 2020, 911inform set out to develop a new solution that simplifies and solves the tracking of movement for IP phones. What was developed was a revolutionary new way to accomplish this that has never been seen before. There is an old Seinfeld episode in which Cosmo Kramer gets a new phone number that gets confused with the hotline for Mr. Moviefone – a phone service that would give information on movie times. In the episode, Kramer utters the infamous line “well why don’t you just tell me what movie you would like to see?”

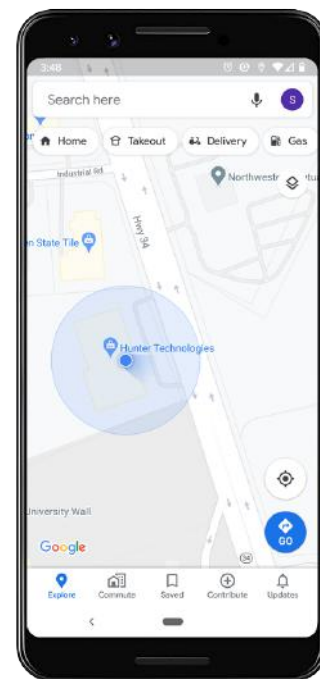
That iconic line inspired our developers at 911inform to have our new LDS solution to simply ask users that moved, “why don’t you just tell me where you have moved your phone?” This eliminated a complex task of trying to associate phones with subnets or ports and the requirement of keeping convoluted cable management databases. 911inform can still utilize the previously mentioned location detection services device to identify the location that the IP phone has relocated to. Today, over 96% of the population owns smartphone or laptop devices. Utilizing these devices as helper beacons, and the location services already embedded within them, the user is presented with a link through a text message or email that extracts the location from the device and updates the solution location databases.



Step 1



Step 2



Step 3

A determination can then be made of their location with where we think they have moved their IP phone to. If the location pin on a floor plan or map that we send is accurate, they can confirm that location and the information will instantaneously update the internal database. Users moving within a building (ex. from the 1st floor to the 3rd floor) are sent a floor plan, that is created by 911inform, asking them to confirm/update their current location on the map. Users that are outside of the building (ex. at home office, Starbucks, etc.) are sent a Google Map with a pin based on the reported device location. This information is only gathered at the time of updating. Once the update is stored in the database, the collection process ends.



Step 1



Step 2

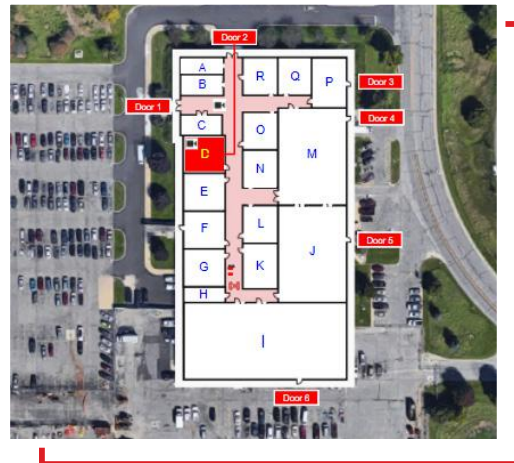
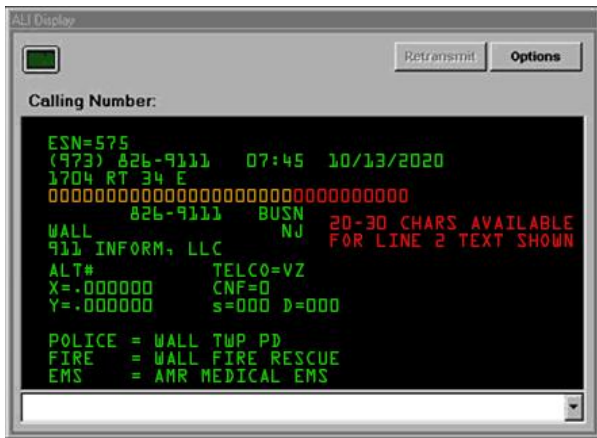


Step 3



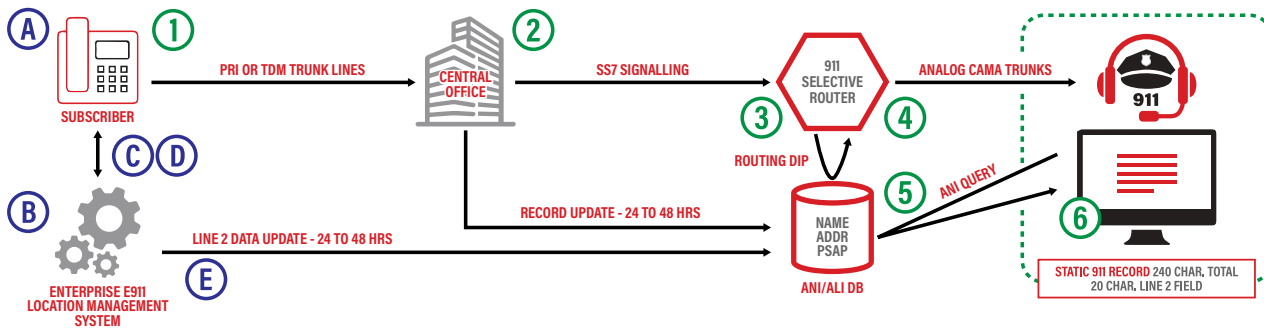
## E911 vs. NG911

E911 (Enhanced 911) is the 911 network functionality available today. E911 provides 2 basic lines of location information to the PSAP. The first is the Line 1 data and consists of the basic address associated with the specific phone number. The secondary Line 2 information is the data a first responder can use to identify a specific location beyond the basic address, allowing them to locate the emergency. Line 2 data is limited to 20 ASCII characters of information and is the information that can be updated when IP phones move location. In many cases, these updates can take anywhere from 24-48 hours to go live in the PSAP.



NG911 (Next Gen 911) is the future of 911. Canada is already taking steps to enable NG911. The CRTC has already announced plans to deploy NG911 starting in June of 2021, and then eliminate the legacy E911 network within 2 years (June of 2023). At this point, the entire country is expected to be fully moved NG911 operations. NG911 provides PSAPs and first responders with multimedia location content that is dynamic and in near real-time. Armed with this information, first responders can locate emergencies within buildings with less guesswork, ultimately reducing response times enabling them to save more lives.

## E9-1-1 CALL FLOW



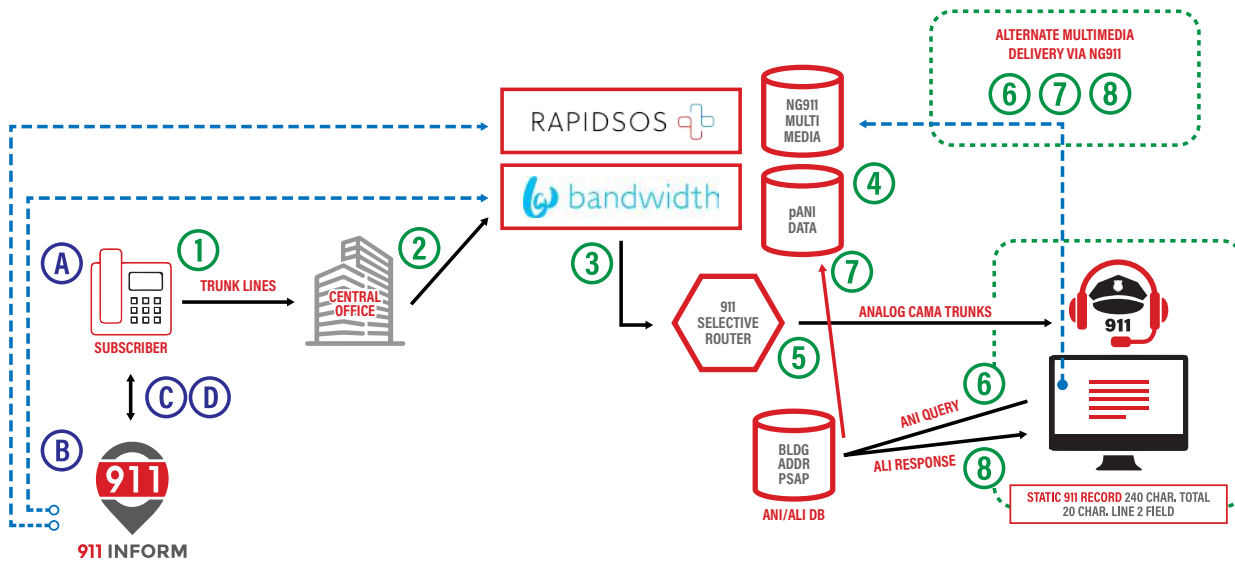
### PRECALL

- A. SET REGISTERS
- B. SET DISCOVERED
- C. MLTS ROUTING DB UPDATED
- D. MLTS CALLER ID DB UPDATED
- E. ALI DATABASE UPDATE WITH 20 CHARACTERS OF LINE 2 DATA

### CALL TIME

1. 911 CALL WITH CALLER ID
2. CO PASSES TO SEL. ROUTER
3. SEL. ROUTER QUERIES FOR PSAP
4. SEL. ROUTER ROUTES TO PSAP
5. PSAP USES ANI TO COLLECT ALI
6. ANI/ALI DISPLAYED TO PSAP

## NG911 CALL FLOW



### PRECALL

- A. SET REGISTERS
- B. SET DISCOVERED
- C. MLTS ROUTING DB UPDATED
- D. MLTS CALLER ID DB UPDATED

### CALL TIME

1. 911 CALL WITH CALLER ID
2. CALL TO BANDWIDTH (SIP OR PSTN)
3. BW PASSES TO SEL. ROUTER
4. BW CREATES PANI RECORD
5. SEL. ROUTER ROUTES TO PSAP
6. PSAP QUERIES ON ANI
7. ANI/ALI UPDATED WITH PANI LOC
8. PANI/LOC DISPLAYED TO PSAP



# 911 INFORM

Make Every Second Count

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*Frost & Sullivan Presents 911inform the New Product Innovation Award  
911inform takes home the top prize in Enterprise Safety Solutions*

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