

MiVoice Connect

RAY BAUM'S General Overview and Solution Deployment Guide for
RedSky

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Kari's Law and RAY BAUM'S Act

In August 2019, the United States Federal Communications Commission (FCC) adopted rules for implementing two federal laws that strengthen emergency calling; Kari's Law and Section 506 of RAY BAUM'S Act.

Kari's law requires that users must be able to dial 911 emergency calls directly without having to dial any prefix or access code, such as the number 9.

RAY BAUM'S Act requires that Multi-Line Telephone Systems (MLTS) must ensure that a "dispatchable location" is conveyed with 911 emergency calls to dispatch centers, regardless of the technological platform used. There are multiple compliance date requirements. In general, the federal rules are forward-looking and apply only with respect to MLTS that are installed after February 16, 2020.

Details about these laws are available at the following link:

<https://www.fcc.gov/mlts-911-requirements>

FAQ about RAY BAUM can be found at the following link. <https://www.fcc.gov/files/mltsfaqspdf>.

- [Introduction of MIVC Support for section 506 of RAY BAUM'S Act and Kari's Law](#)

Introduction of MIVC Support for section 506 of RAY BAUM'S Act and Kari's Law

MiVoice Connect has always been able to implement direct 911 emergency dialing. Similarly, sending a dispatchable location by Site is standard for on-premises and fixed devices (although some companies might need to evaluate whether additional granularity is required, such as, the floor level, room number, and so on.). This location information is sent as a Caller Emergency Service ID (CESID) through the telephone carrier, which delivers location information to the Public Safety Answering Point (PSAP) based on the calling number.

Section 506 of RAY BAUM'S Act (hereafter referred to as "RAY BAUM" for simplification) has additional requirements to deliver a dispatchable location for on-premises non-fixed devices and off-premises devices. According to the FCC, this location information should be automated if technically feasible, a location based on end-user manual update, or the best available location information that can be obtained from any available technology or combination of technologies at reasonable cost.

For non-fixed and off-premises devices, MiVoice Connect systems, beginning with Release 19.2 SP2 can deliver a dispatchable location by integrating with third-party companies known as Next Generation 911 emergency service providers (NG911). Depending on the customer requirements, the CESID can be mapped to the phone's location using the IP address range, MAC address, or updated directly by the user into an application. The NG911 service providers also offer other features such as email and SMS notification to other individuals when a 911 emergency call is made.

MIVC - RAY BAUM High Level Architecture with RedSky

Before making any changes, customers should spend some time planning how they will implement their solution to meet RAY BAUM'S Act. The option selected must be based on the type of deployment in place, such as:

- The size of the physical location site
- Whether the deployment is purely on-premises
- Whether the deployment includes off-premises endpoints

Depending on the solution, the customer might:

- Need not upgrade, but rather use existing CESID mappings to allow for automatic move detection of IP phones.
- Need to upgrade to get the new CESID mappings.
- Need to upgrade to get the new CESID mappings and also to integrate with a third-party vendor.

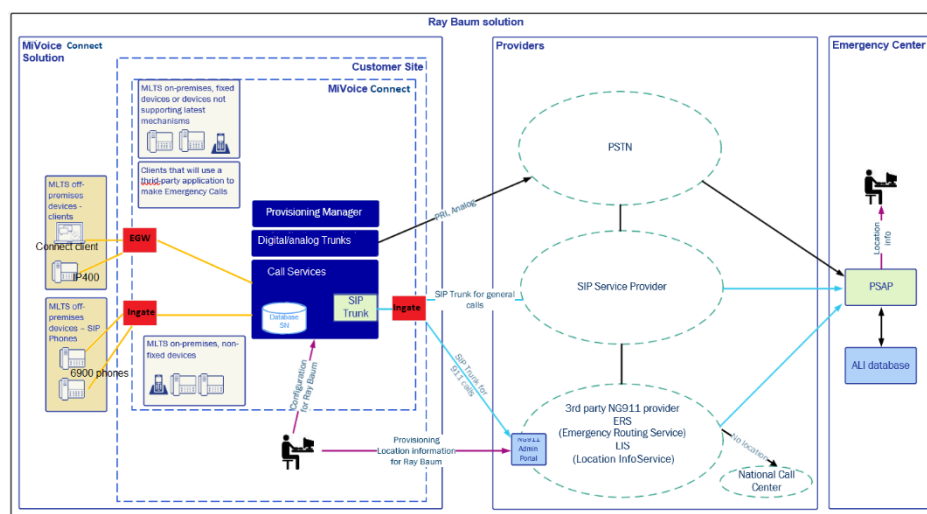
To help illustrate the options, consider a customer with a large physical deployment that will require more than one dispatchable location. For example, a single floor of a large building might require four dispatchable locations, one to cover each corner:

1. Customer has only on-premises IP4xx and/or 69xx and/or DECT devices. In this situation, the customer can order the required number of CESIDs (four in this example) from their service provider and use the existing IP range and/or L2 CESID mapping features available on MiVoice Connect system without the need for any upgrade. Enabling these features provides a dynamic location update if the device is moved by the user within the premises.
2. If the customer adds Connect Client softphones on laptops or mobile phones or any kind of remote Teleworkers to their solution, the customer must upgrade and integrate with a Mitel-verified third-party vendor.

The solution required for third-party NG911 vendor integration will be discussed further in this document, while describing using the RAY BAUM feature without integrating NG911 vendors.

The following figure illustrates a high-level view of the MiVoice Connect RAY BAUM architecture.

Figure 1 : MiVC system onsite - RAY BAUM high-level architecture



The MiVoice Connect RAY BAUM solution is composed of the following components, which are described in the following sections.

- [RedSky](#)
- [Edge Gateway](#)

- [Ingate SIParator](#)
- [MiVoice Connect](#)
- [Establishing a Contract with RedSky](#)
- [Access Control List of the Ingate Servers with RedSky](#)
- [Horizon Mobility Setup - RedSky Portal](#)

RedSky

A valid commercial agreement with RedSky is required. Part of setting up this agreement involves:

- Pre-authorization of the external internet address of Ingate(s) by RedSky.
 - Identification of the following transport protocols to use with RedSky:
 - UDP on port 5060
 - TCP on port 5060
 - TLS v1.2 and later versions on port 5061
- Note:** To use the TLS protocol, an Ingate is required.

From this agreement, you must obtain the following information from RedSky:

- Pre-authorization of the external Internet address of the Ingate(s) used by RedSky.
- RedSky SIP Gateways - Primary and secondary SIP gateways using UDP (5060) or TLS 1.2 or later versions (5061) that MiVoice Connect/Ingate will use for emergency calls. These gateways must be preconfigured and tested during the implementation and integration between MiVoice Connect and RedSky. The number 933 can be used as the test number.
- RedSky Horizon Mobility Portal - This is the main configuration portal for RedSky. You must:
 - Define the users as follows:
 - + Emergency On-Site Notification (EON) users - This is required for notifications.
 - + Basic user/Enterprise users - This is required for devices that will use the MyE911 application for location identification.
 - Define Locations
 - Refer to the RedSky applications guides, in particular the *RedSky Horizon User Guide*, *MyE911 User Guides* (for Windows/Mac).
 - Review the downloadable applications for MyE911 application - RedSky provided application to run along with select third-party softphone devices (Vendor app method for location).
- Organization ID - This is used by RedSky to isolate one Organization's locations from that of another. This information is also available in the RedSky Portal.
- HTTP enabled location discovery (HELD) URL - This is used by some devices to update their location directly to RedSky location information server (LIS).
- HELD+ Secret - This is used by RedSky to authenticate client access to the RedSky LIS. This information is also available in the RedSky Portal.

Edge Gateway

Edge Gateway is used for enabling Teleworker support for IP 400-Series phones and Connect Client.

Ingate SIParator

- Acts as Session Border Controller (SBC) and enables SIP trunking to and from the NG911 service provider.
- Enables Teleworker support for 6900-Series phones. (In pipeline for 2022 release).
- MiVoice Connect can be directly integrated with the without using Ingate by RedSky vendor using MIVC trunk switches. However, the deployment with Ingate is suggested for flexibility, security, management, and also for SRTP support.

MiVoice Connect

The following are the major network elements of MiVoice Connect:

- Provisioning interface

- Call servers
- SIP peer for Ingate
- Trunking nodes for PSTN or SIP trunks

MiVoice Connect enables the following features for RAY BAUM conformance:

- Location information by wire-map or by HTTP enabled location discovery (HELD).
- DID and calling party number (CPN) substitution for each device (or location) that can be used to make 911 emergency calls.
- SIP peer profile dedicated to signaling with NG911 vendors, which helps in vendor integrations.
- SIP device capabilities for devices that provide location information.
- Emergency number dialing and routing calls based on trunks configured.

The Ingate SIParator is commonly used as the Session Border Controller (SBC) between MiVoice Connect and the third-party NG911 service provider in the solution.

A SIP trunk is set up between MiVoice Connect and Ingate; and between Ingate and the third-party NG911 service provider.

MiVoice Connect contains emergency location identification information for devices that are used with the RAY BAUM'S Act solution.

Establishing a Contract with RedSky

The channel partner/customer must have an agreement with RedSky. The agreement must be prepared with the information listed in the following table.

Table 1: Required information for the contract with RedSky

Requirement	Description
Ingate(s) External IP Address	RedSky maintains an access control list to limit access to their SIP gateways. The MiVoice Connect solution will require the IP addresses of the Ingate(s) used by RedSky to be added to the access control list.
SIP Transport Protocol	RedSky's access control list limits the transport protocol allowed for the SIP gateway.
Buildings/Locations	The number of locations required to satisfy RAY BAUM's law.
HELD Clients	These are the number of users/devices that will provide Geolocation (currently, provided only by Connect Client).
MyE911® application	The number of users/devices that will require the NG911 application (for example, third-party soft phones such as Xlite and so on)


During the initial setup with RedSky, the RedSky connectivity worksheet is typically used. See the [RedSky worksheet](#) for more details.

The following table describes the RedSky connectivity worksheet.

Table 2: RedSky worksheet

Information	Description
IP Address of Termination Point	IP address or WAN FQDN of the Ingate(s). This is used by RedSky's access control list (see Sample RedSky Access Control List for more information).
Transport Method	RedSky supports only a single transport protocol for their SIP trunk, and this protocol must be determined at the time of setup.
Primary Gateway	Identifies the primary SIP peer for MiVoice Connect and SIP trunk for Ingate.
Secondary Gateway	Identifies the Secondary SIP peer for MiVoice Connect and SIP trunk for Ingate.

Figure 2 : Sample RedSky Access Control List


SIP Connectivity

Network Information:
RedSky assumes that the customer has the appropriate level of expertise required to configure their own devices. Customers are responsible for the configuration and operation of their own equipment.

1) Method of Connectivity to RedSky Lab

IP Address of Termination Point:
(Public IP the SIP Invite is coming from) ____ . ____ . ____ . ____

Transport Method:

UDP	<input type="checkbox"/>
TCP	<input type="checkbox"/>
TLS	<input type="checkbox"/>

2) RedSky Gateway Information

RedSky IP address / port range that the customer will connect to:

Primary Gateway

Interface: 18.189.128.222
primevgw1.lab.e911cloud.com

SIP Port: 5060 (TCP/UDP)
5061 (TLS)

RTP Port Range: 30000 – 60000

Secondary Gateway

Interface: 3.134.4.224
primevgw2.lab.e911cloud.com

SIP Port: 5060 (TCP/UDP)
5061 (TLS)

RTP Port Range: 30000 – 60000

Access Control List of the Ingate Servers with RedSky

RedSky SIP gateways will accept calls only from pre-authorized customers. For the MiVoice Connect solution, RedSky must pre-authorize the IP address/FQDN of the Ingate(s) for customers. If the RedSky

SIP gateway receives a SIP invite from an unknown SIP client, then a 403, Forbidden error will be sent back.

Horizon Mobility Setup - RedSky Portal

The RedSky Portal is available through the web. RedSky will provide this URL through a welcome email. For more detailed information about using this portal, see the *Horizon Mobility User Guide* available from RedSky.

The following are some of the methods for setting up location information in RedSky:

- Location based on CESID/Alternate ID.
- Location based on HELD.
- Location based on network discovery.
- Location based on device ID using MyE911 application.
- Location based on phone number.

MiVoice Connect based on the deployment and devices use subsets of the above methods for RAY BAUM conformance.

Following is a list of devices supported in MiVoice Connect and the respective methods used for location management with RedSky.

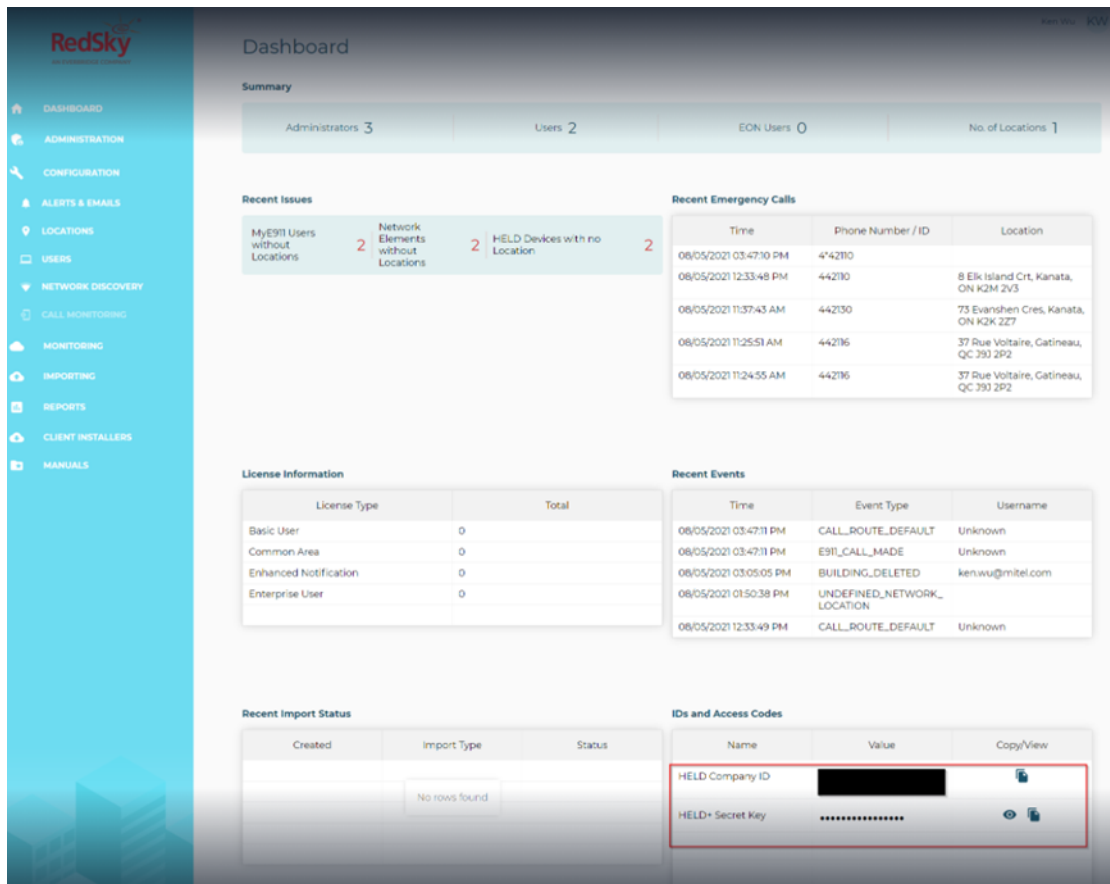
Table 3: List of devices supported in MiVoice Connect

Device Type	Location Management Method
69xx	Location based on CESID/Alternate ID
IP4xx/MGCP	Location based on CESID/Alternate ID
DECT handsets	Location based on CESID/Alternate ID
MIVC Connect Client Softphone	Location based on HELD
Analog phones	Location based on CESID/Alternate ID
ATA	Location based on CESID/Alternate ID
Any third-party softphones	Location based on device ID using MyE911 application

The RedSky Portal configuration for the above location management methods and other general steps to be followed for the MiVoice Connect solution to work with RedSky are as follows:

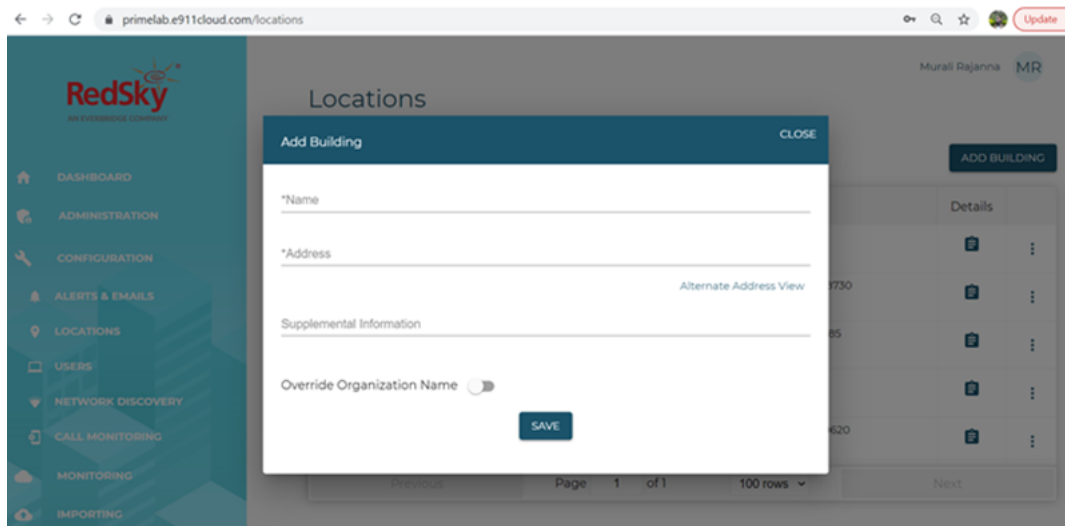
1. From the RedSky Portal, obtain the **Organization ID** and **Secret Key** information.

Figure 3 : HELD Company ID and secret key



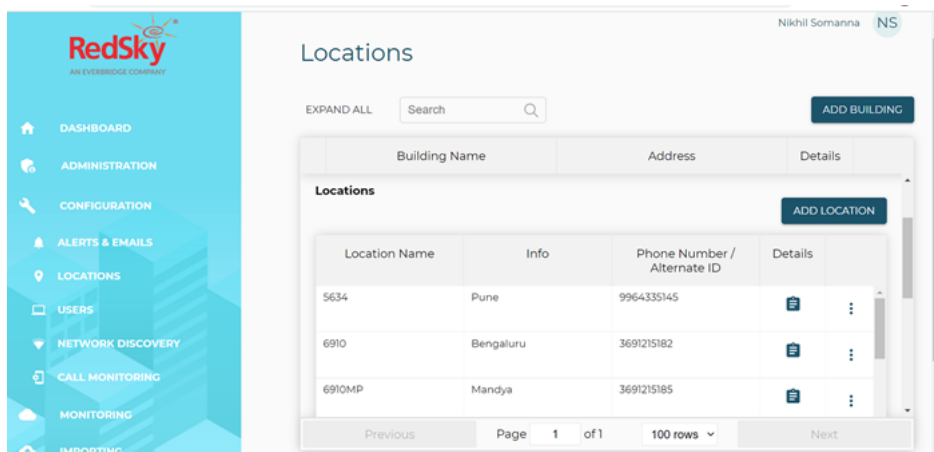
2. Identify the HELD URL and HELD credentials for your HELD-enabled clients.
Note: RedSky will send the HELD URL through a welcome email.
3. The Organization ID, Secret Key, HELD URL, and the HELD credentials for your HELD-enabled clients are used in setting up the MIVC SIP peer profile and HELD configuration:
 - a. HELD configuration is used by devices that use the HELD protocol to manage location information. Currently, only Connect Clients use this protocol.
 - b. The HELD configuration information is enough for devices to manage location using HELD. For these clients, no manual configuration is to be made in the RedSky Portal.
4. Obtain the location information using CESID/Alternate ID:
 - a. Configure Buildings/Locations with the Alternate ID. The Alternate ID configured is the CESID; the same CESID must be used to configure the location for devices in MiVoice Connect Director.
Note: Any number of Alternate ID/CESID can be configured in RedSky depending on the number of unique dispatchable locations as required for RAY BAUM conformance.

Figure 4 : Adding a building



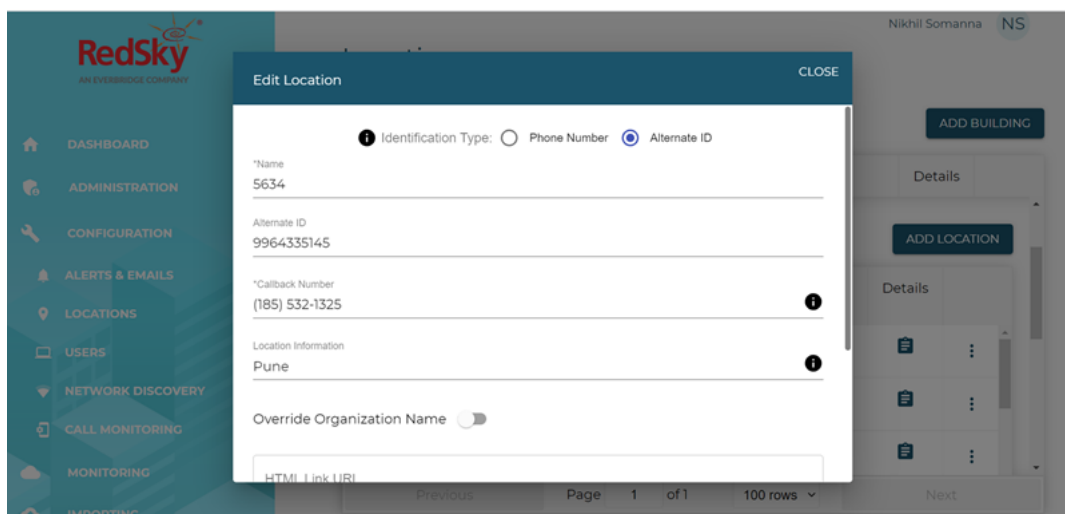
- b. In the RedSky Portal, go to **Configuration > Location > Buildings > Add Location** to add the locations.

Figure 5 : Adding a location



- c. In the page that opens, provide the name, location, and other details, select **Alternate ID**, enter the 10-digit unique numeric ID (CESID), and click **Add**.

Figure 6 : Adding alternate location ID



5. Obtain the location information using the device ID (MyE911 application):
- Configure the device users for MyE911 users (for example, X-Lite and other third-party softphone users).

- b. In the RedSky Portal, go to **Configuration > Users > Add User** and provide an email ID and other required details.
- c. Under **Device User ID**, provide the extension number for the user and click **Add**.
Note: For systems using On-Net Dialing (OND) prefixes, while configuring the emergency 911 vendor application, do not add a hyphen in the extension while specifying the device user IDs. For example, for the extension, instead of 53000-50712, enter 5300050712 in the **Device User ID** field.

Figure 7 : Vendor app details

Note: See the *Manuals* section in the *My911 User Guide* for more details.

- 6. Configure the Emergency Notification application for Kari's law conformance:

- a. Add EON users:
 - A. In the RedSky Portal, go to **Administration > Administrators > Add Administrators**.
 - B. In the page that opens, select the **Role** as **EON User**, enter the email address, first name, last name, and click **Save**.

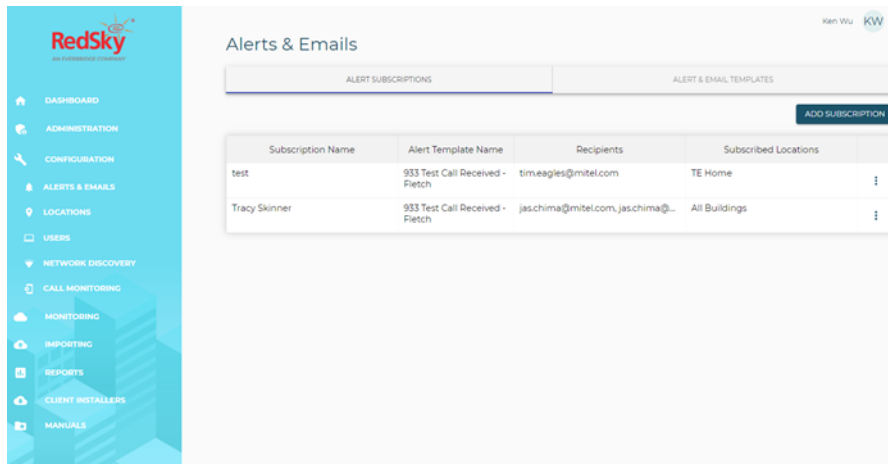
Figure 8 : Adding an EON user

- b. Configure EON users:
 - A. Add an Alert Subscription - For Kari's law conformance, create a subscription Alert Type of Emergency Call Received. Others are optional, but highly recommended. Add EON users, email and/or SMS message recipients.
 - B. While selecting buildings, select all buildings to get notification for all users. If a specific building is selected, then the notification will be sent only to phones located in that building.

- C. Add an Alert Template - For Kari's law, the standard Emergency Call Alert Template is sufficient for an alert template.

Note: This EON notification is used in conjunction with MiVoice Connect Emergency Notification application.

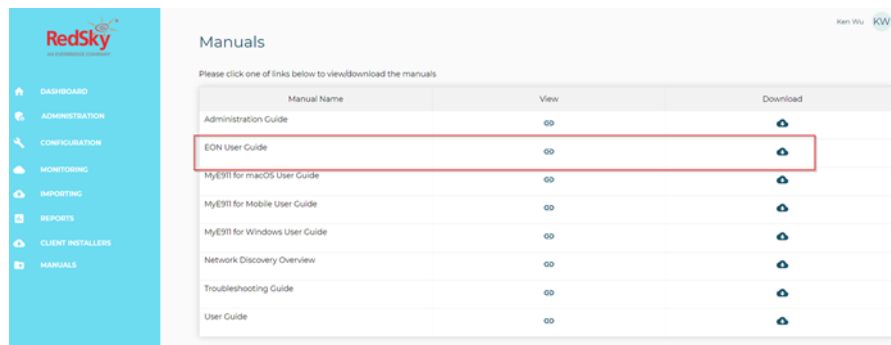
Figure 9 : Adding subscriptions and alerts



Note: See the *Manuals* section in the *EON User Guide* for more details.

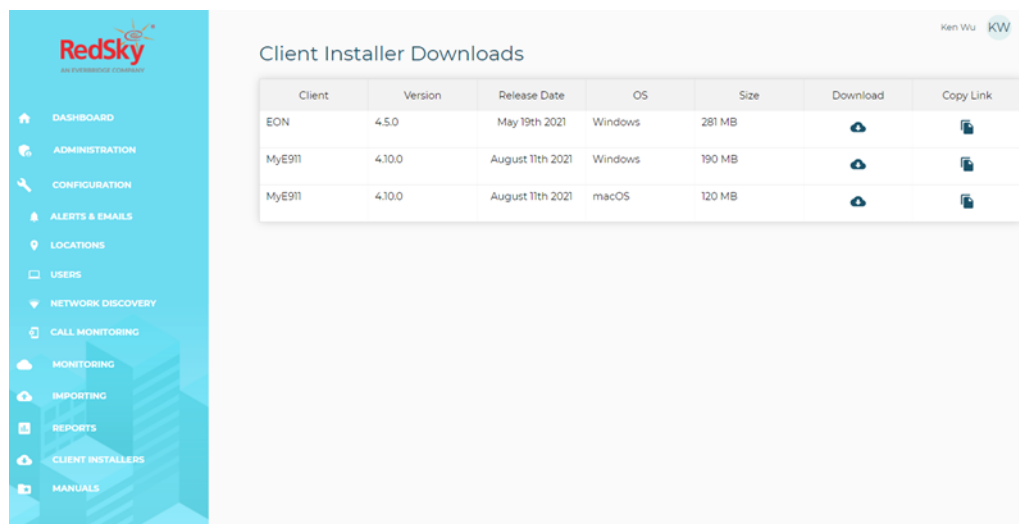
7. Provide documents for installation and application as required:
 - a. In the RedSky Portal, click **Manuals** to view the RedSky manuals.

Figure 10 : RedSky manuals



- b. In the RedSky Portal, click **Client Installers** to download the client installers.

Figure 11 : Client installers



Solution: How the integration works

- [Non-Fixed Devices](#)
- [Collecting Data](#)
- [Sending Data to RedSky](#)
- [Collecting Data](#)
- [Sending Data to RedSky](#)

Non-Fixed Devices

A non-fixed device is a device that the end-user can move from one endpoint to another without assistance.

Collecting Data

For non-fixed devices, MiVoice Connect will check for the Geolocation, MAC address, and IP address.

Additional information can be added in the MiVoice Connect database to complement the information received from the device. The additional information must be added in the system by the system administrator.

MiVoice Connect uses the following priority order for deriving the location information during an emergency call:

- Geolocation – provided by HELD-enabled devices
- L3 (IP address) to CESID mapping
- L2 to CESID mapping
- Manual/Automatic CESID based on the switch type
- Site/Zone CESID

Sending Data to RedSky

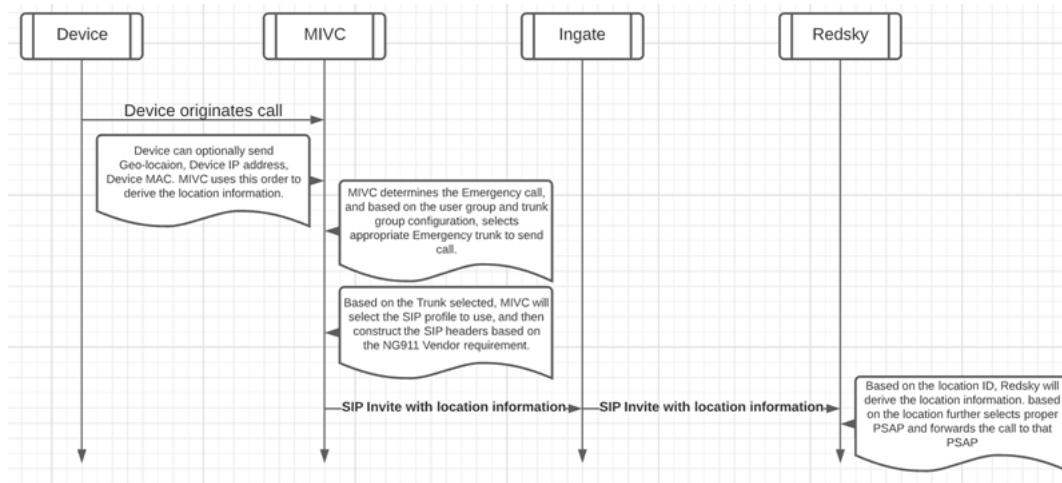
After MIVC has collected the information from the device side, it builds the information to be sent in the SIP trunk, including the appropriate SIP headers required by RedSky.

After that, the call is sent to Ingate, which will transparently pass the call with the supported SIP headers to RedSky.

To conclude the process, RedSky will validate the information received and will take the appropriate action. If the data is accurate, the call is sent directly to the PSAP (emergency center). If the information is not accurate, then the call is redirected to the National Call Center for further triage.

Note: The call to the National Call Center entails an extra cost for the customer.

Figure 12 : Sending Data to RedSky



Fixed Devices

Fixed device is a device that cannot be moved to another place in the enterprise without assistance from a professional installer or network manager.

Collecting Data

For fixed devices, as no information is provided by the device, MiVoice Connect will use the programmed CESID (switch port CESID, switch, or Site CESID). This information must be added in the system by the system administrator.

Sending Data to RedSky

After MiVoice Connect has collected the information from the device side, it checks which provider is used, and it builds the information to be sent in the SIP trunk, including the appropriate SIP headers as required by RedSky.

After that, the call is sent to Ingate, which will transparently pass the call through the supported SIP headers to RedSky.

To conclude the process, RedSky will validate the information received and will take the appropriate action. If the data is accurate, the call is sent directly to the PSAP (emergency center). If the information is not accurate, then the call is redirected to the National Call Center for further triage.

Note: The call to the National Call Center entails an extra cost for the customer.

Emergency Callback

Previously the CESID was considered as the location identifier and an emergency callback number. For RAY BAUM enabled SIP trunks, MiVoice Connect will separate the two concepts:

- CESID remains the location identifier for most devices; except for devices for which geo-location is enabled, and softphones that will use a RedSky provided application to identify the location.
- The calling party number (CPN), the Substitution/DID, or the DN of the device will be used to support emergency callback (required for RedSky).

Note: RedSky does not directly support emergency callbacks. These calls will go from the PSAP back through the public PSTN.

Acronyms, Abbreviations, and Glossary

- **ELIN** - Emergency Location Identification Number also known as CESID.
- **LIS** - Location Information Service
- **ERS** - Emergency routing Services.
- **CID** - Caller ID
- **CESID** - Caller's Emergency Service Identification
- **MAC** - Media Access Control
- **SRTP** - Secure Real-time Transport Protocol
- **CPN** - Calling Party Number
- **EON** - Emergency On-Site Notification
- **E911** - Enhanced 911
- **FQDN** - Fully Qualified Domain Name
- **Fixed devices** - Fixed device is a device that cannot be moved to another place in the enterprise without assistance from a professional installer or network manager.
- **L2** - Layer 2
- **L3** - Layer 3 of the Open OSI model
- **MLTS**- Multi Line Telephone System. Equivalent to a PBX, but is the nomenclature used in the RAY BAUM'S Act.
- **NG911** – Next Generation 911
- **Non-fixed devices** – A non-fixed device is a device that the end user can move from one endpoint to another without assistance.
- **SBC**– Session Border Controller
- **SIP** - Session Initiation Protocol
- **TLS** - Transport Layer Security
- **TCP** - Transmission Control Protocol
- **HELD**– HTTP-enabled location discovery
- **UDP**– User Datagram Protocol

