MiVoice Office 400

RAY BAUM'S Act General Overview and Solution Deployment Guide Kari's Law

January 2022

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RAY BAUM'S ACT GENERAL OVERVIEW AND SOLUTION DEPLOYMENT KARI'S LAW

In August 2019, the USA government adopted rules for implementing two federal laws that strengthen emergency calling: Kari's Law and Section 506 of RAY BAUM'S Act.

The Multi-line Telephone Systems (MLTS) – Kari's Law and RAY BAUM'S Act 911 Direct Dialing, Notification, and Dispatchable Location Requirements is described at the following link:

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

RAY BAUM'S Act classifies devices into two categories:

- Fixed MLTS devices - devices that connect to a single location (for example, a desk phone or office phone) and are not capable of being moved to another location by the end-user, although they may be moved to a different location by a professional installer or network manager.
- Non-Fixed MLTS devices - devices that the end-user can move from one location to another without assistance.

INTRODUCTION OF MIVOICE OFFICE 400 SUPPORT FOR SECTION 506 OF RAY BAUM'S ACT AND KARI´S LAW

MiVoice Office 400 (MiVO 400), as an MLTS, implements support for Section 506 of the RAY BAUM'S Act and Kari´s law.

Note: In this document, Section 506 of the RAY BAUM'S Act and Kari´s law are together called Ray Baum for simplification.

For the MiVO 400, we have the following device categories:

- Fixed MLTS Devices - Analog devices.
- Non-Fixed MLTS devices - IP devices, SIP devices, SIP-DECT devices, and so on.

For RAY BAUM'S support, the MiVO 400 is not integrated with any Next Generation 911 (NG911) providers in the USA and has not been validated against Intrado or RedSky solutions.

For Kari's Law, the MiVO 400 will be configured to support direct dial for 911 (emergency calls), without having to dial any prefix or access code. This default programming is assigned when the Channel ID for the system is set to US-Freemarket.

Generation and release	
Generation	MiVoice Office 400
Release	Release 6.3 HF2
System	
Communication server	Mitel 470
Country	US
Equipment ID (EID)	[redacted]
Support ID	[redacted]
Channel ID (CID)	US-Freemarket
Configured users	31
User licences (used / available / total)	User: 31 / 14 / 45 ♦ Basic: 0 / 5 / 5

Figure 1 Generation and release – Channel ID (CID)

All 911 calls can be delivered via Analog trunk, SIP trunk, or ISDN (PRI) trunk to the Public Safety Answering Point (PSAP).

Support for multiple dispatchable location details requires the use of PRI or SIP trunks as there is no CESID support for 911 calls via analog trunks. Only standard location address per analog trunk, which the trunk provider handles, is provided to the PSAP.

MIVO 400 - RAY BAUM HIGH-LEVEL ARCHITECTURE

Mitel's MiVO 400 based Emergency Call solution implements the use of CESID programming that will deliver unique digits over PRI or SIP trunks on behalf of the device that dialed 911. These unique digits will be a registered PSAP entry that provides the dispatchable location details for a given caller.

Note: the CESID digits need to be validated by the carrier service provider and the PSAP because the MiVO 400 will replace the standard company caller ID with the CESID digits for emergency calls.

The MiVO 400 solution for Ray Baum is composed of different devices (softphones or hard phones), and Mitel applications.

For the MiVO 400, we have the following device categories:

- Fixed MLTS Devices - Analog devices.
    - it requires a module in the MiVO 470 chassis
- Non-Fixed MLTS devices - IP devices, SIP devices, SIP DECT devices, and so on.
    - SIP - Mitel Phones (6800 and 6900 series)
    - Single Cell DECT (112 DECT Phone)
    - SIP – Third-Party phones

The following are the minimum MiVO 400 requirements for Emergency Call integration:

- A MiVO 400 system (470 model) with software version 5.x, 6.x, or 7.0.
    - SIP or PRI trunk channel licenses.
        - SIP or ISDN route for the 911 calls.
    - Devices licenses (directly for the terminals or as part of user licenses).
    - CESID assignments and programming for devices (no licensing required).
    - MBG with SIP trunks licenses (optional)

Figure 2 shows a high-level architectural view of MiVO 400 support for Ray Baum.

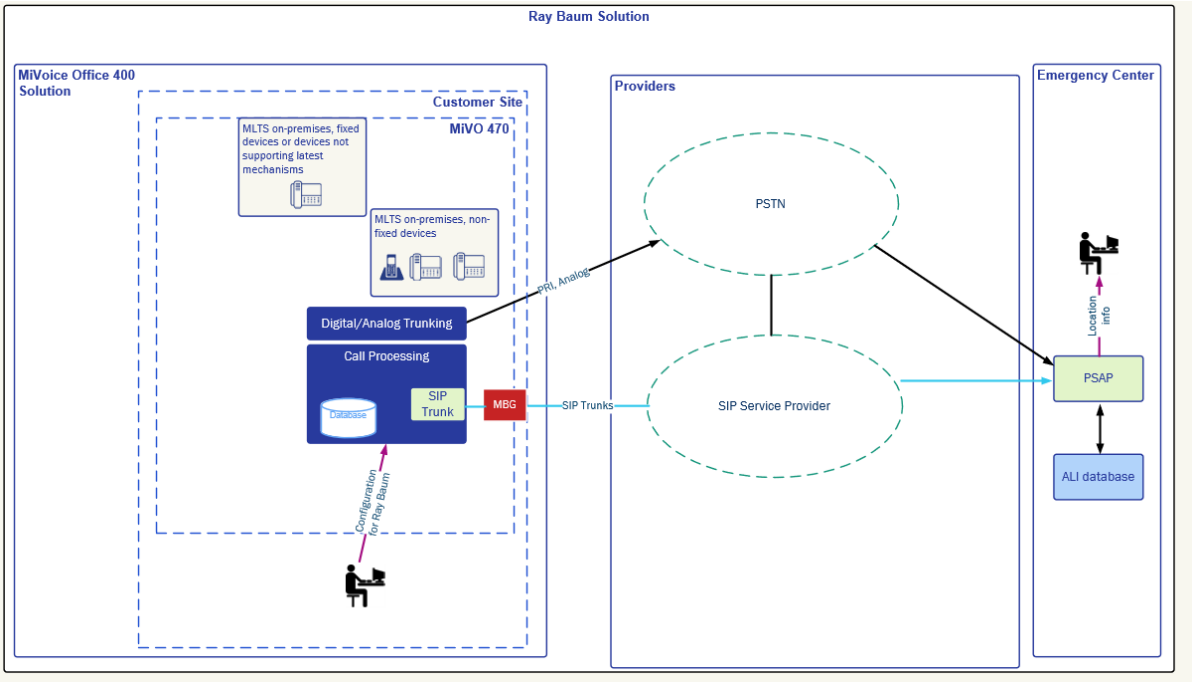

Figure 2 *MiVoice Office 400 system one site - Ray Baum High-Level Architecture*

DESCRIPTION OF MIVO 400 - RAY BAUM SUPPORT

The MiVO 400 system must be configured correctly to achieve the functionality required by the law. The specific functions required to support emergency service in North America are:

- Trunk Groups
- Emergency Location database
- CESID digit assignments

Additional standard MiVO 400 functions are also needed:

- Route setup
- Extension setup
- IP address mapping

LIMITATIONS

Remote users (Teleworker) are not supported with the MiVO 400 US market solution. Therefore, MBG Teleworker support has not been validated for Ray Baum.

Mobile phones – Mobile phones are not part of the MiVO 400 solution with Ray Baum as they use the native phone function to provide the location services information during an emergency call.

MIVO 400 REQUIREMENTS

Product	Minimum S/W Release	Minimum Requirements/Comments
MiVO400	5.0	

Product	Minimum S/W Release	Minimum Requirements/Comments
MBG	11.3	For SIP trunking
SIP DECT	SW version, which is delivered with the MiVO 400 release	8.3SP1 for MiVO 400 R7.0 8.1SPx for MiVO 400 R6.x 8.0 for MiVO 400 R5.x
IP DECT	11.6	
Mitel 68xx/69xx SIP Set	SW version, which is delivered with the MiVO 400 release	6.0 for MiVO 400 R7.0 5.1SPx for MiVO 400 R6.x 5.0 for MiVO 400 R5.0
Single Cell IP DECT	RTX V620B1	

HOW THE INTEGRATION WORKS

NON-FIXED DEVICES

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

This type of device includes SIP desk sets such as the Mitel 6900 and 6800 series devices.

For non-fixed devices, the IP address of the set is used to map the emergency location ID (ELIN – also known as a CESID) in the MiVO400 emergency location mapping table. This requires that the customer map their network to the dispatchable locations required for the RAY BAUM'S Act.

If the customer is unable to provide the network map capability to emergency locations, the MiVO 400 solution for Ray Baum will be limited to devices that cannot be moved without administrative involvement; that is, the user cannot move the devices without making programming changes. Therefore, to ensure that an end-user does not have the ability to move a non-fixed device, the customer must implement policies and/or technologies that prevent end-users from moving the device without administrative action. For example, the use of MAC address "locking" to a specific Ethernet switch port (for example, "Sticky" MAC) or a physical barrier to moving the set such as locked wall plates.

FIXED DEVICES

A fixed device is a device that cannot be moved by an end-user within the enterprise without assistance from a professional installer or network manager.

COLLECTING DATA

For fixed and non-fixed devices, the MiVO 400 internal logic will check for information in the emergency location database. (This information needs to have been added to the system by the system administrator before the call is placed).

After MiVO 400 has collected the information for the device, it checks which trunk provider/route is configured to be used and builds the information to be sent in the SIP trunk or ISDN trunk of the provider, including the appropriate SIP headers required by the provider.

EMERGENCY CALL OVERVIEW

During normal call handling for PSTN outbound calls, the user or company Caller ID will be delivered to the provider.

In this case, this is a normal call (non-emergency) with the added Caller ID. This view is from a sniffer trace for a call over a SIP trunk.

```
> Frame 1: 1072 bytes on wire (8576 bits), 1072 bytes captured (8576 bits)
> Ethernet II, Src: Multitec_00:be:ef (00:80:00:00:be:ef), Dst: Mitel_00:ba:ba (08:00:0f:00:ba:ba)
> Internet Protocol Version 4, Src: 192.168.2.100, Dst: 192.168.2.140
> User Datagram Protocol, Src Port: 5060, Dst Port: 5060
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:6135553101@192.168.2.140 SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 192.168.2.100;branch=z9hG4bK_AI2021Dec2022357376135553101207;rport
    > To: sip:6135553101@192.168.2.140
    > From: <sip:5554443333@192.168.2.140>;tag=AI6AFC238D7AA86D15
      Call-ID: AI5EFAA10A7992E5C9_00:08:5d:9a:05:a8
      [Generated Call-ID: AI5EFAA10A7992E5C9_00:08:5d:9a:05:a8]
    > CSeq: 1 INVITE
      Allow: ACK,BYE,CANCEL,INVITE,NOTIFY,OPTIONS,PUBLISH,UPDATE,REFER
      Allow-Events: presence,dialog,message-summary,refer
      Max-Forwards: 70
      User-Agent: Aastra 400
      Content-Type: application/sdp
      Privacy: none
      Accept: application/sdp
    > P-Preferred-Identity: <sip:5554443333@192.168.2.140>
      P-Early-Media: supported
      Supported: 199
    > Contact: <sip:5554443333@192.168.2.100:5060>
      Content-Length: 345
  > Message Body
```

When a device dials 911, the MiVO 400 replaces the Caller ID with the CESID programming.

```
> Frame 1: 1049 bytes on wire (8392 bits), 1049 bytes captured (8392 bits)
> Ethernet II, Src: Multitec_00:be:ef (00:80:00:00:be:ef), Dst: Mitel_00:ba:ba (08:00:0f:00:ba:ba)
> Internet Protocol Version 4, Src: 192.168.2.100, Dst: 192.168.2.140
> User Datagram Protocol, Src Port: 5060, Dst Port: 5060
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:911@192.168.2.140 SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 192.168.2.100;branch=z9hG4bK_AI2021Dec20443451391163;rport
    > To: sip:911@192.168.2.140
    > From: <sip:6135555555@192.168.2.140>;tag=AI98BCB827EB93AB9C
      Call-ID: AIC75E7D76A57EA23E_00:08:5d:9a:05:a8
      [Generated Call-ID: AIC75E7D76A57EA23E_00:08:5d:9a:05:a8]
    > CSeq: 1 INVITE
      Allow: ACK,BYE,CANCEL,INVITE,NOTIFY,OPTIONS,PUBLISH,UPDATE,REFER
      Allow-Events: presence,dialog,message-summary,refer
      Max-Forwards: 70
      User-Agent: Aastra 400
      Content-Type: application/sdp
      Privacy: none
      Accept: application/sdp
    > P-Asserted-Identity: <sip:6135555555@192.168.2.140>
      P-Early-Media: supported
      Supported: 199
    > Contact: <sip:6135555555@192.168.2.100:5060>
      Content-Length: 345
  > Message Body
```

MIVO 400 EMERGENCY CALL CONFIGURATION

This chapter describes the various features/components that must be configured as part of the Emergency Call configuration.

ROUTING/GRAPHICAL VIEW

In the programming interface, under *Routing/Graphical* view, there is a full view of outbound call paths and the various programming that is used.

For outbound, it starts with the user, through the Route, through the Trunk Group and then the Network Interface (SIP or PRI). The US Market channel configuration sets up the default outbound trunk access code of 9.

For Emergency calls, the programming involves a few more steps.

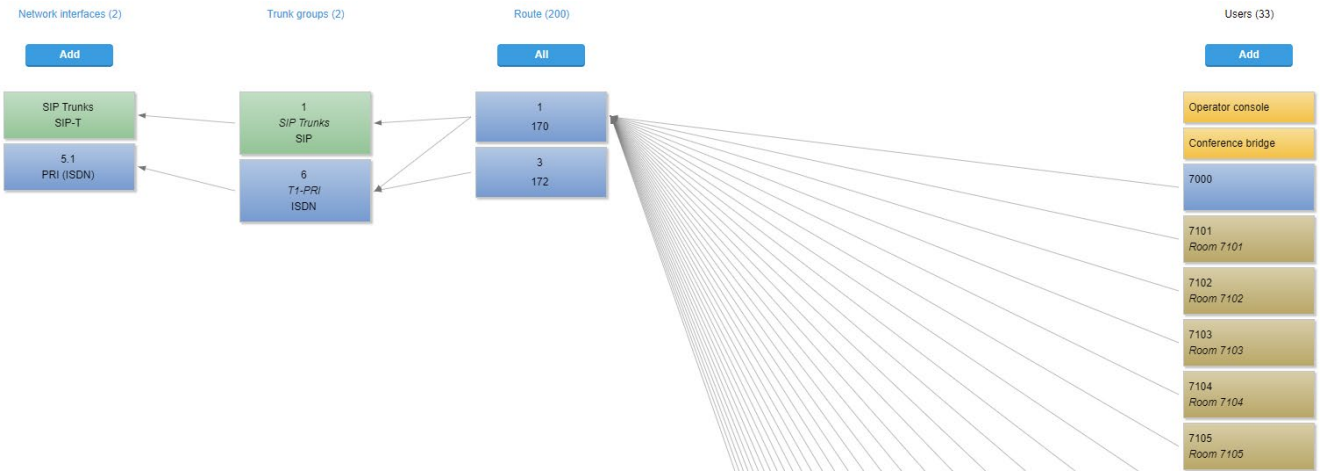

Figure 3 Routing/Graphical View

SIP TRUNK GROUP

During the configuration of the SIP trunk, it is possible to select an Emergency location protocol. Depending on the SIP Service Provider, the following programming options are useful:

- CLIP (Emergency location ID – ELIN/CESID - will be sent in FROM, PAI, and CONTACT header of the outgoing SIP INVITE message). The above-mentioned sniffer trace examples use this programming option. This is the default when US Freemarket is selected.
- PAI (Emergency location ID will be sent in the PAI header of the outgoing SIP INVITE message).

EMERGENCY LOCATION DATABASE

The Emergency Location database includes the configured location IDs.

The following data are stored in this database:

- Emergency location identifier (CESID/ELIN)
- Municipality identifier (not used in the US market)
- Route for outgoing emergency call
- Description of the location (these details are used only for internal Mitel display sets to view the Emergency response team devices) and the browser-based Hospitality Manager application.
- Internal emergency responsible team
- Additional email addresses for notifications

IP ADDRESS TO EMERGENCY LOCATION MAPPING TABLE

The table that maps IP address to emergency location includes entries for different types of non-fixed devices. It is possible to map an IP address or an IP address range to an MiVO 400 emergency location data set entry.

The use of this table requires that the company's IT department configure their network such that they know where each LAN cable terminates for accurate mapping of IP address to physical location. For example, a range of switch ports is associated with an assigned IP address range or subnet. Further, it is important, that if this setup changes this mapping table is updated accordingly.

ACCESS CODE

The public emergency number (911) may be called with or without an access code. The system will guarantee that the access code is not necessary; but in case it was dialed, it will be removed from the outgoing call to the detected outgoing trunk.

LEAST COST ROUTING (LCR)

If LCR is used in the system configuration, make sure that in all routes used for emergency calls, the check box 'Suppress LCR' is selected (these are cleared by default). This is used when there are multiple outbound routes for calls.

MIVO 400 LOCATION ID DEFINITION (CESID)

The Location ID is a reference/identification number used to identify a device or several devices in the MiVO 400. For the US market, only digits are used, and these are known as a CESID or ELIN. These reference/identification digits must be pre-defined and registered with the PSAP.

Once a location ID has been defined in MiVO 400 emergency location database, the location ID can be associated with:

- the MiVO 470 system (default)
- IP addresses or IP address range
- or the terminals.

The Location ID can be sent as an alternative ID (that is, ELIN/CESID) in cases where an assigned DID number is not registered as an PSAP entry and provides the 'location identity' of a specific physical place to determine a building, a campus, a site, a room, suite, or radio cell reference. This series of digits will be cross-referenced in the PSAP's ALI database to provide a detailed location of the caller to the PSAP agent. The ALI/PSAP database entries must be manually managed and updated because there are no automatic updates/synchronization from the MiVO 400.

The location ID can be set up depending on the granularity required by the customer requirements. For example, one CESID per terminal or one CESID per floor or per East or West location of the floor. It is the customer's responsibility to define these requirements.

Figure 4 shows some examples of location ID supported by the MiVO 400 emergency location database.

In the example, the customer has two buildings:

- Building 1 has three floors and Building 2 has two.
    - Building 1 has a Location ID for each floor and the floors contain different rooms, each of them with a location ID.
    - Building 2 has a Location ID for the rooms on the different floors, each of them has one.

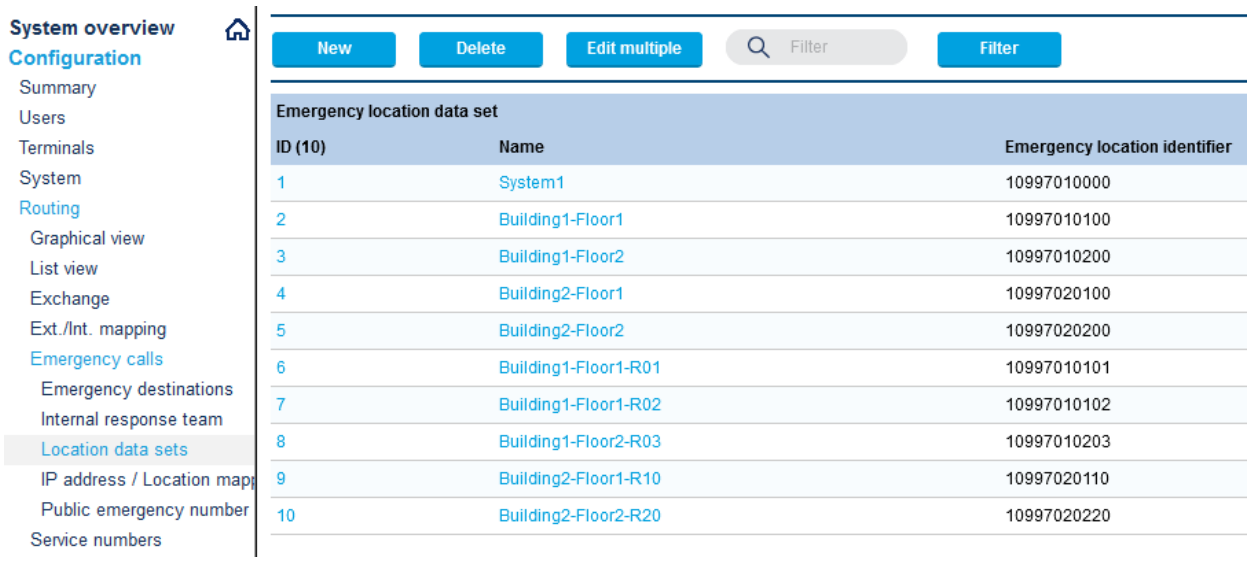

Figure 4 *Example for Location data sets*

While the Location ID supports digits and characters, digits only are recommended for the US market.

Note that the Administrator of the MiVO 400 system has the responsibility of providing accurate information about the exact location for a device. The user location details are the responsibility of the customer.

LOCATION MAPPING TO IP

To support an assigned IP address to a physical location in the building, the Network Admin must assign IP subnets that will be used for the MiVO 400 to deliver the correct Emergency Location ID (CESID) for that location.

Where DHCP is utilized, the DHCP scope will need to be configured to provide the required IP addressing based on the location of the source of the DHCP request; that is, the switch port. The MiVO 400 DHCP service can support multiple subnets, or the customer may use their own DHCP server. The switch port(s) will need to be configured in a VLAN associated with the required IP address range, which in turn is associated with the appropriate DHCP scope. This requires that the customer's switches utilize IP Helper or DHCP Relay to send the DHCP request to the correct DHCP scope.

Note Currently, MiVO 400 does not support the Mitel SIP phone capability of using LLDP-MED for address mapping.

Figure 5 shows an example of an IP address location mapping table for SIP hallway phones. The SIP hallway phones are distributed on four different floors in two different buildings and each of them is associated with a location ID. Each floor is assigned with a different location ID, each device is assigned to one of these location IDs via the IP address mapping table in the MiVO 400.

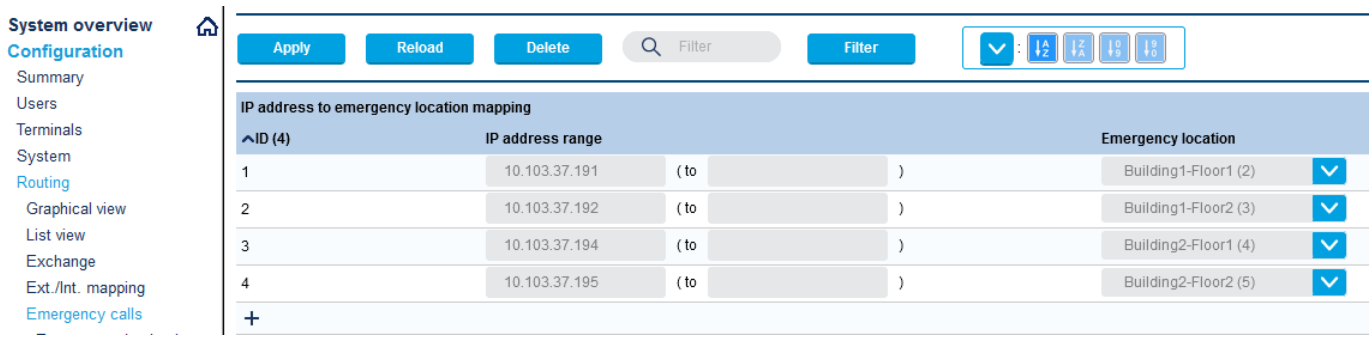

Figure 5 *Example for IP address / Location mapping table*

Note that depending on the floor size, one location ID might be used to identify the whole floor. If only one dispatchable location is required for all the hallway phones covering the floor, they can be given the same location ID. In the above example, an IP range would be set up (not shown) to handle multiple hallway phones on the same floor and assign the same Emergency Location to that range.

SYSTEM DEFAULT CESID

The location IDs from the Location data sets are assignable as one global location ID for the whole system (Figure 6) and to different types of terminals as well (Figure 7).

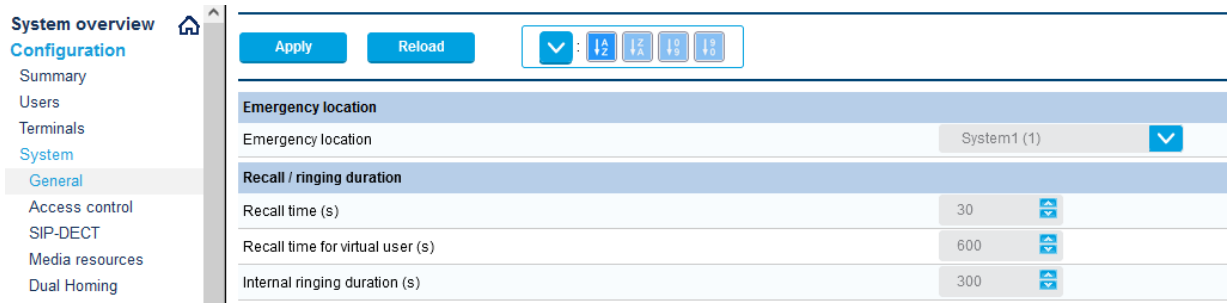

Figure 6 *Assignment of a location ID to the system*

TERMINAL ASSOCIATED CESID

Terminal associated CESID is used primarily with fixed devices such as an analog device or SIP sets that cannot be moved by the user without administrative assistance.

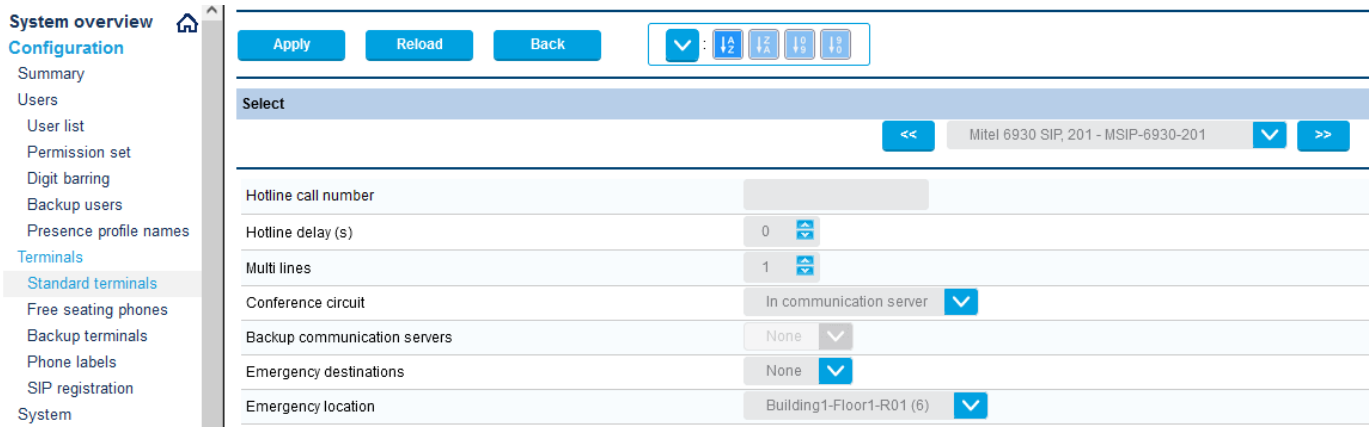

Figure 7 ***Assignment of a location ID to a terminal***

NOTIFICATIONS AND EVENTS/LOGS

MiVO 400 provides an event when an emergency call is made. This event is stored in the event log in the controller where the emergency call is started.

MiVO 400 can also be set up to provide an emergency notification to an internal emergency response team (using Mitel SIP sets) and the Hospitality Manager application (must be selected in Location Data Set programming). It can also be configured to send emails to notify when an emergency call is made. A valid email address and an SMTP mail server must be configured. These features are addressed in the MiVO 400 documentation and Knowledge Base articles explain these options further.

EMERGENCY NOTIFICATIONS

Alerts contain the following information, if available:

- Emergency call from – shows the extension that made the emergency call.
- to number – shows the dialed that is, 911.
- Location – shows the location associated with the extension in the Emergency Location Data Set.

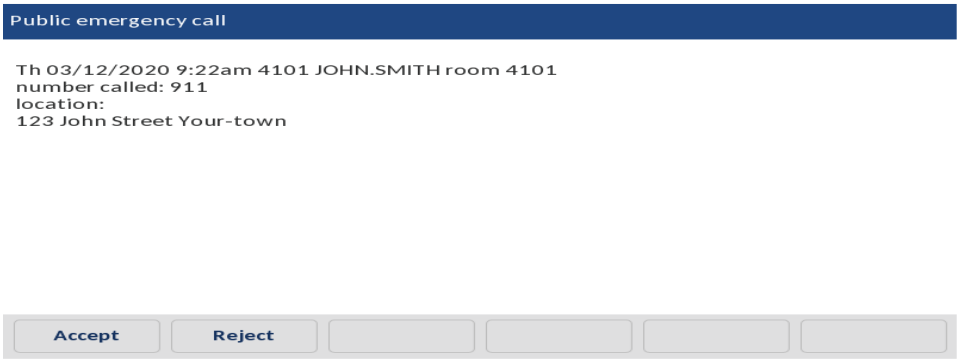

Figure 8 Emergency Notifications

These alerts must be acknowledged by one of the emergency response team members to silence the alert.

The Hospitality Manager web-based applications provide a list of emergency calls.

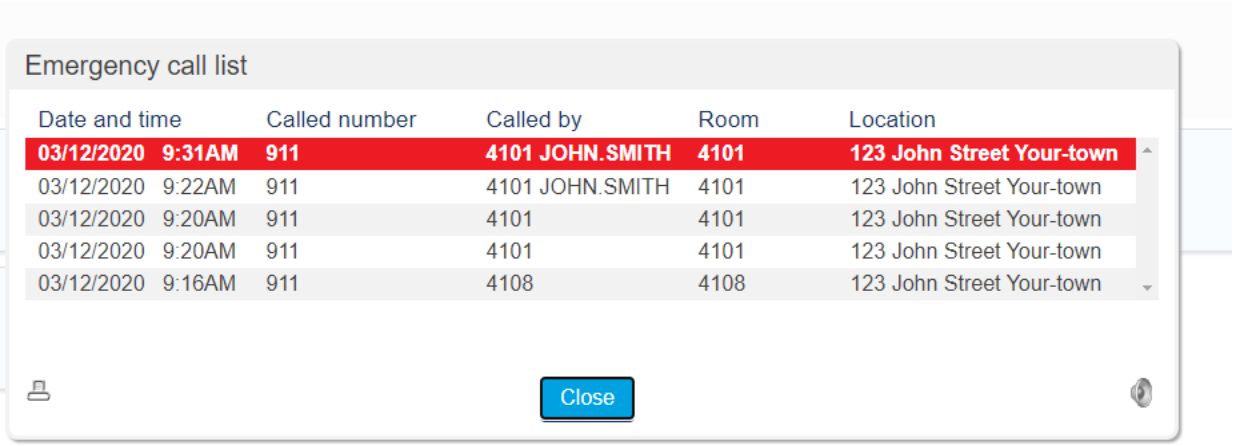

Figure 9 Emergency call list

EVENTS/LOGS IN MIVOICE OFFICE 400

In the event log of the MiVO 400, two entries are added. One with an event/notification "Emergency call started" and the other with an event/notification "Emergency call ended". The events/notifications contain the following information:

- Dialed call number – shows the dialed number; that is, 911.
- User number – shows the extension or the user that made the emergency call.
- Caller – shows the programmed terminal ID that made the emergency call.

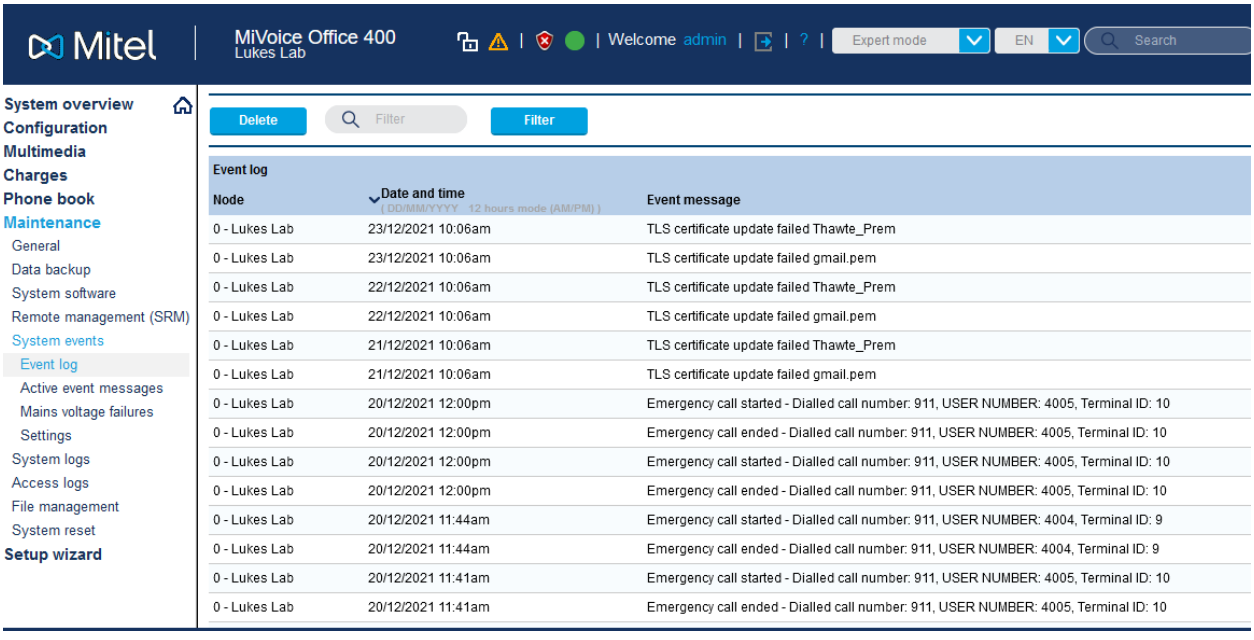

Figure 10 Events/Logs in MiVoice Office 400

ACRONYMS, ABBREVIATIONS, AND GLOSSARY

CESID - Caller Emergency Service Identification, equivalent to ELIN.

ELIN - Emergency Location Identification Number, equivalent to CESID.

ERS - Emergency Routing Services.

Fixed devices - A fixed device is a device that an end-user cannot move from one endpoint to another within an enterprise without assistance from a professional installer or network manager.

MBG - Mitel MiVoice Border Gateway (SBC solution from Mitel).

MLTS - Multi-Line Telephone System. Equivalent to 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 within an enterprise without assistance from a professional installer or network manager.

NANP – North American Numbering Plan (https://en.wikipedia.org/wiki/North_American_Numbering_Plan)

PAI header - P-Asserted-Identity header.

PANI header - P-Access-Network-Info header.

PBX - Private Branch Exchange, equivalent to MLTS.

PSAP - Public Safety Answering Point.

SBC – Session Border Controller.

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