MiVoice MX-ONE

Emergency Services and RAY BAUM Integration with Intrado

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Mitel®

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Introduction of Emergency Services

MiVoice MX-ONE can be configured to work with the Emergency Services requirements of USA. Mitel's MX-ONE, as an MLTS, implements Section 506 of the RAY BAUM'S Act and Kari´s law support in conjunction with third-party Next Generation 911 (NG911) emergency services.

This guide describes the integration between MX-ONE and the third-party Next Generation 911 emergency services provider Intrado.

In this document, section 506 of RAY BAUM'S Act and Kari´s law are referred to as RAY BAUM for the sake of simplicity.

For MX-ONE, the following two device categories are defined:

1. Fixed MLTS devices - TDM devices (Analog Devices, Digital Devices, and Integrated DECT).
2. Non-Fixed MLTS devices - IP Devices, SIP Devices, softphones, all Teleworkers, and so on.

To fully support the requirements of RAY BAUM, MX-ONE is integrated with Intrado Next Generation 911 (NG911) service provider for the USA market.

Description of MX-ONE RAY BAUM Integration with Intrado

MX-ONE implements RAY BAUM in conjunction with Intrado as the MX-ONE 911 solution alone does not meet the legislated requirements for RAY BAUM for all non-fixed devices.

For Kari's Law requirements, MX-ONE can be preconfigured for the direct dialing of 911 (emergency calls), without having to dial any prefix or access code. The 911 calls are sent via SIP trunk to Intrado and Intrado will redirect the call to the appropriate Public Safety Answering Points (PSAPs) based on the civic address of the location as identified by the NG911 service provider.

NOTE: The MX-ONE solution primarily sends Location identifiers to Intrado during emergency calls. Intrado will look up these Location identifiers to determine the civic address, which is used in the signaling to the PSAP. Intrado validates the civic address when the location is created in their database.

With the RAY BAUM'S Act solution, the Mitel MiVoice Border Gateway (MBG) is used as the Session Border Controller (SBC) between MX-ONE and Intrado in the solution. If a customer has an existing MBG used for SIP trunks, this can be upgraded to release 11.3 or later and used for the connection to Intrado. Additionally, the MBG can be used for MiCollab Remote User (Teleworkers). Standard engineering guidelines apply.

NOTE: Mitel validates the solution only with the MBG. Customers utilizing SBCs of other vendors will need to work with their SBC vendor for verification of NG911 Emergency Request Services (ERS).

The integration described in this guide requires that the customer has a valid service agreement with Intrado.

NOTE: Mitel does not provide this service agreement directly. To support local notifications compliant with Kari's law compliant, the solution will use Intrado´s notification application.

NOTE: MX-ONE notifications (including Mitel Revolution) provide supplemental information and are not sufficient to meet Kari's law on their own when MX-ONE is used in conjunction with an ERS.

Emergency callback behavior depends on the NG911 service provider selected. Intrado provider will pass on the callback information from the call-server (or if none is provided, use a fixed callback field in their Location database), which will enable the PSTN to route the call back from the PSAP over the public

PSTN to the specified callback number. In this case, MX-ONE will need to use the existing DID features to route the incoming emergency callback from the public PSTN.

Intrado also offers a function called Extension bind for non-DID numbers. This function, when enabled, assigns a temporary valid DID callback number for the extension number (non 10-digits number) that made the 911 call. In this case, if the call gets disconnected the Emergency Response Team can call back the person that called the Emergency Service.

MX-ONE RAY BAUM – High-level Architecture

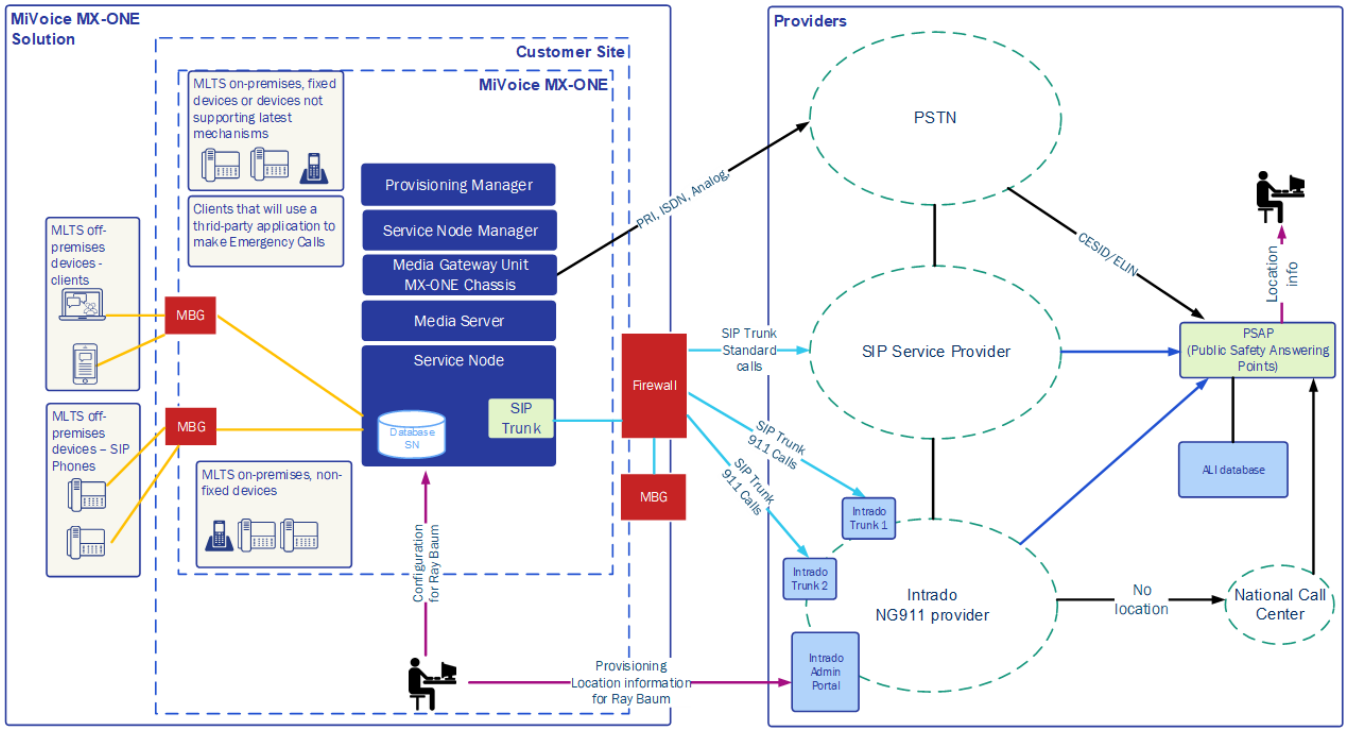
MX-ONE solution was validated together with the Intrado Next Generation 911 (NG911) service provider.

The integration described in this guide requires that the customer has a valid service agreement with Intrado.

NOTE: Mitel does not provide this service agreement directly.

The following figure shows a high-level architectural view of the MX-ONE RAY BAUM integration with Intrado using a single MX-ONE system.

Figure 1.1: MX-ONE system one site - RAY BAUM High-level Architecture



The setup shown in the above figure is used as a part of the integration validation.

Solution Components

The MX-ONE RAY BAUM solution is composed of the following components:

MX-ONE

The MX-ONE system comprises the following components:

- The MX-ONE Service Node – Call Server Control.
  The call server component that takes care of the signaling is called MX-ONE Service Node. It is a Linux-based call control software that can either be installed in a private cloud as an instance or reside in a standard Intel-based server.
  The MX-ONE Service Node contains an emergency location database among other functions, which is used to store the data used by the emergency solution in MX-ONE, in this case, RAY BAUM'S Act data.
- MX-ONE chassis with Media Gateway Unit.
  The MX-ONE chassis is used to house TDM boards used by legacy devices.
  - Media Gateway Unit (MGU card) is used for media transcoding. It also contains TDM trunks (E1 or T1 interfaces).
  - Analog board is used to provide analog extensions (Optional).
  - Digital board is used to provide digital extensions (Optional).
  - DECT board is used to provide Integrated DECT extensions (Optional).
- MX-ONE Media Server.
  - Media Server is a software-based media gateway used for media transcoding.
- MX-ONE Provisioning Manager.
  - Management system used to configure end-user information and end points (devices).
- MX-ONE Service Node Manager.
  - Management system used to configure system information; for example, number planning and route/trunks.

MiVoice Border Gateway

MiVoice Border Gateway (MBG) is used as the SBC between MX-ONE and Intrado in the solution.

NOTE: The MBG is used as Teleworker for MiCollab clients and can be used together with the SIP trunks to connect with NG911 service provider. Standard engineering guidelines apply.

Teleworker support - An additional MBG is required for Remote Users (Teleworkers) - SIP phones (Mitel 6800 and 6900 series).

SIP Trunking to or from NG911 Service Provider

A SIP trunk is set up between MX-ONE and MBG and between MBG and the NG911 service provider.

For redundancy purpose, the NG911 service provider offers two point of presence (two different locations). It is recommended that two SIP trunks are set up between MBG and NG911 provider. For this case, MX-ONE can have one SIP trunk towards the MBG and the Round Robin mechanism in the MX-ONE Service Node software can provide load-balancing functions between the SIP trunks. For example, the first call goes to the Point of Presence 1 and the second goes to the point of presence 2.

Another approach is to use two SIP trunks between MX-ONE and MBG and two SIP trunks between MBG and the Points of Presence (PoPs).

Emergency SIP Trunk for Calls from Logged on or Logged off SIP Devices

The Emergency SIP trunk handles the emergency 911 incoming calls from logged on and logged off SIP devices to MX-ONE system according to configured emergency trunk profile.

Any MX-ONE setup restriction for Traffic Connections and A-number presentation will be disabled for the calling SIP device and Geolocation, BSSID, MAC address, and Emergency Location Identification

Number (ELIN) information provided by the device will be forwarded as input data to the emergency location database lookup for Location-ID.

Devices

Devices that are normally used in MX-ONE include 6800 and 6900 SIP phones, DECT, and Wi-Fi cordless phones as well as legacy analog and digital phones.

Optional Mitel Applications

The following components can be integrated with the MX-ONE RAY BAUM solution.

- InAttend Client
- MiCollab Clients
  - Desktop PC and MAC
  - Web clients

Intrado Components

- Intrado provides civic address validation and notification for the solution compliant RAY BAUM'S Act.
- **Portal**: In Intrado, a web portal is used to set up the information required for the solution to work properly. Much of the information required depends on the provider, but some information is mandatory; for example, the civic address, a valid DID (10-digit dialable number) for callback calls, a valid DID number (10-digit dialable number), an extension number or a location identification of the device. The access to the Intrado portal is provided by Intrado for a customer with a valid commercial agreement.
- **SIP trunk**: In the Intrado solution, a SIP trunk is used to receive 911 calls. The trunk must be pre-configured and tested during the implementation of the integration between MX-ONE and Intrado. Intrado provides primary and secondary gateway for redundancy. The SIP transport mode can be configured as UDP or TCP (port 5060). As TLS is not supported as transport protocol by Intrado, a VPN option is available to secure the SIP traffic between the customer premises and Intrado´s point of presence (highly recommended solution). Contact Intrado for additional information on VPN options.

Requirements for MX-ONE RAY BAUM Integration with Intrado

Mitel MiVoice MX-ONE Solution Requirements

The following table summarizes the minimum MX-ONE requirements for the RAY BAUM solution.

Product	Minimum SW Release	Minimum Requirements/Comments
MX-ONE	7.4	• SIP trunk licenses For the RAY BAUM solution, a minimum of two SIP trunk routes are required along with the SIP channel licenses. • One SIP trunk for the connection between MX-ONE and MBG configured using Round Robin functionality reaching the two NG911 POPs (Points of Presence) and another for internal Emergency SIP trunk handling incoming emergency (911) calls to MX-ONE from SIP devices and clients. **NOTE:** MX-ONE requires the internal Emergency SIP trunk to remove any service that the extension has. For example, a number presentation restriction or traffic connection restrictions for SIP devices/clients. • Devices licenses • Optional licenses
Mitel MiVoice Border Gateway (MBG)	11.3	At least one standalone MBG in the solution with the appropriate SIP trunk licenses. • MBG licenses • SIP trunk connections to NG911 service providers (a minimum of two connections is recommended for redundancy, one for each Point of Presence). **NOTE:** If remote users (Teleworkers) using SIP Phones (6800 and 6900 series) are needed as part of the solution, an additional MBGs is required. In MX-ONE solution, a dedicated MBG is always used for the Teleworker SIP Phones. In some cases, if the capacity allows, the MBG used by the MiCollab clients can also be used by the SIP trunks. Standard engineering guidelines apply.

Product	Minimum SW Release	Minimum Requirements/Comments
SIP-DECT 6xx	8.3 SP1	Device-based provisioning of an ELIN/CESID that is to be sent during calls.
IP-DECT 56xx (ASCOM)	11.6	Device-based provisioning of an ELIN/CESID that is to be sent during calls.
5634 Wireless (ASCOM) WinPDM (Management tool)	3.0.2 3.15.3	Device-based provisioning to enable sending of the MAC address (BSSID) of connected Wireless Base Station during calls.
MiCollab	9.4 SP1	Geolocation support via HELD the NG911 service provider's location information server.
6800 and 6900 SIP Phones	6.1 or later	Pop-up support (for supporting Teleworker devices).
InAttend	2.6 SP3	RAY BAUM emergency private queue.

Intrado Requirements

The customer must have a valid agreement with Intrado (https://www.intrado.com/) to get access to their services.

Description of MX-ONE RAY BAUM Support

Introduction

MX-ONE release 7.4 implements functions to support emergency services requirements according to the USA E911 legislation.

MX-ONE system must be configured properly to support the functions required by the law. The functions specific for supporting emergency services in the USA are:

- SIP trunk profiles
- MX-ONE emergency location database
- Domain setup
- Integrated DECT setup (if the customer uses Integrated DECT)

Additionally, the following standard MX-ONE functions are also needed:

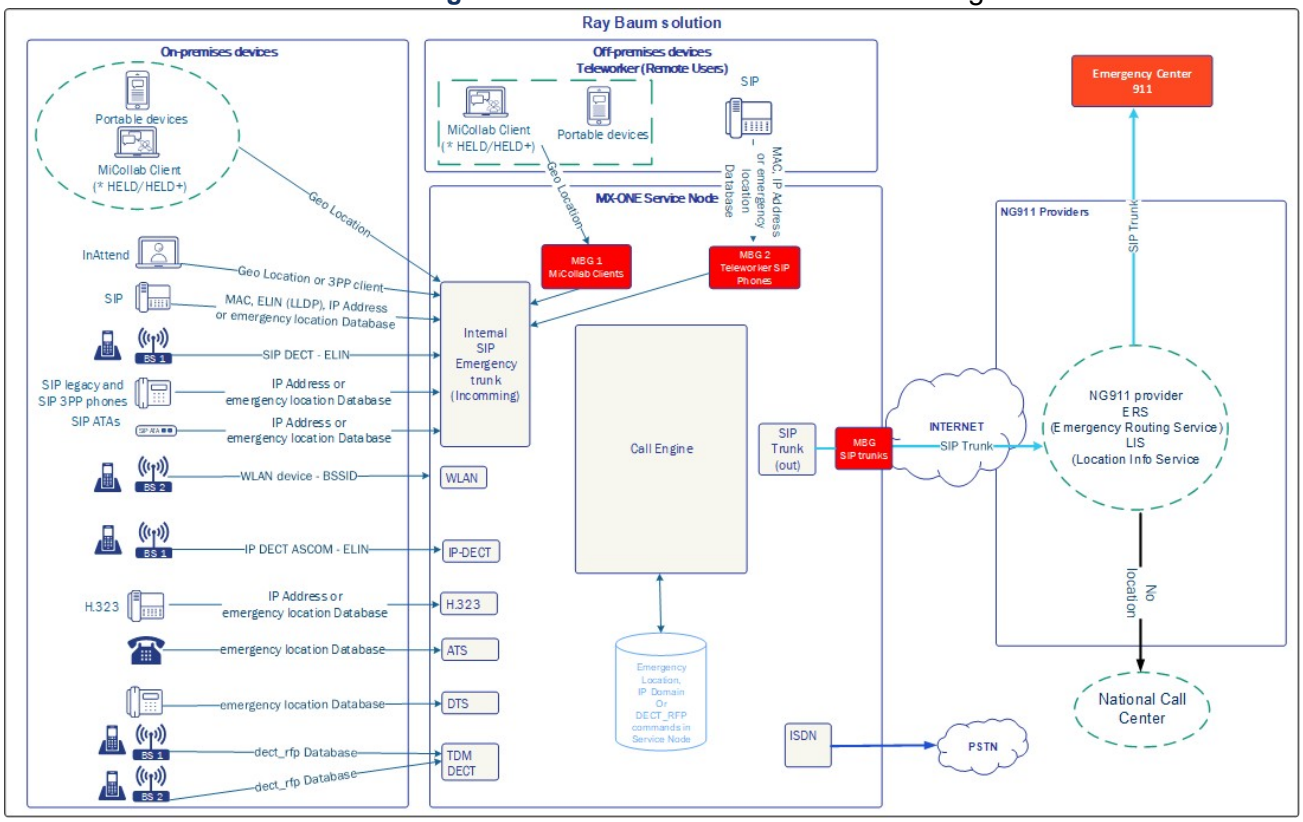
- Number conversion
- Least Cost Routing
- Route setup
- Extension setup
- Alternative routing

How the Integration Works

When a user dials the emergency number 911, the call engine inside MX-ONE will look for the type of device used to make the call and collects the appropriate data (A-Number, Geolocation, BSSID, MAC address, and an ELIN/CESID or an IP address) if available.

After that, the MX-ONE system prepares the data (Geolocation, A-Number or Location ID) to be sent via the SIP trunk to the Intrado NG911 service provider.

Figure 3.1: MX-ONE Service Node Call Engine



The RAY BAUM solution comprises three main components: devices, MX-ONE, and the NG911 service provider.

Following is a description of these components.

- **Devices**: The devices are used to initiate an emergency call. Each device needs to provide a unique identifier during the call setup to MX-ONE. The identifiers can be a A-number, Geolocation, BSSID, MAC ad- dress, and an ELIN or CESID or an IP address. The devices must be properly configured by the customer system administrator to provide the re- quired information.
- **MX-ONE**: The MX-ONE, call manager processes the information received from a device and sends it to the NG911 service provider via MBG. The information that is sent by MX-ONE depends on the NG911 requirements; it can be:
  - A 10-digit number
  - An identifier such as ELIN or CESID > In MX-ONE, the Location ID (location identifier) is used to provide the ELIN/CESID information to the NG911 service provider. The Location ID is defined in MX-ONE via a command.

    NOTE: The MX-ONE RAY BAUM call engine processes the data in the following priority order if multiple input information is provided by the device:

- **Geolocation**: provided by HELD (HTTP-Enabled Location Delivery) protocol. The devices need to support the HELD protocol.
- **BSSID**: provided by the 5634 to MX-ONE, the Wi-Fi access point's Basic Service Set Identifier (BSSID) in the SIP INVITE or 200 OK (PANI header).
- **MAC Address:** provided by 6700, 6800, and 6900 SIP phones in the INVITE (SIP instance) – mainly used in Teleworker mode (6800 and 6900).

  NOTE: 6700 is not supported in Teleworker mode.

- **ELIN or CESID** provided by SIP-DECT or the IP-DECT in the SIP INVITE or 200 OK (PAI header), and in SIP Phones (configuration in the network switch).

  NOTE: The device or the base station must support the ELIN or CESID setup.
- **IP address**
- **Emergency Location database**, `dect_rfp` command (Integrated TDM DECT).
- **Emergency Location database**, `emergency_location` command.
  MX-ONE must be properly configured by the system administrator (customer or partner) to provide the required information.
- **Intrado - NG911 Service Provider**: Intrado providing ERS (Emergency Routing Services) function receives the call setup information from MX-ONE and verifies with the Location Information Server (LIS) that there is a preconfigured valid civic address associated with the device/user (subscriber) before forwarding the call to the correct Public Safety Answering Point (PSAP).
  Intrado supplies a web portal where the customer system administrator must set up information about the customer on-premises environment, for example, validated civic address of the building and network information for HELD devices, or any information that could specify a dispatchable location.

  NOTE: If there is no valid location information, the call is redirected by the Emergency Routing Services (ERS) to their National Contact Center to get the location manually. This process may incur an extra cost per call that will be charged to the end-user.

Extension bind: Extension bind is a feature that enables Subscriber ID field to accept an extension. It is helpful in cases where the customers do not use 10-digits dialable numbers (DID), for example in hotel. If the function is enabled, when a 911 call is sent to Intrado, the Intrado system will recognize the extension as the Subscriber ID and it will assign a temporary callback number for that extension number (non 10 digits number). Existing sip trunk route between MX-ONE and Intrado will then be used to setup the callback call from the Emergency Response Team via Intrado system to the extension in MX-ONE.

NOTE: Extension bind is a feature that requires Intrado activation as it is not available by default.

For additional information about the Intrado setup, see the Intrado vendor's documentation.

Devices

Non-Fixed Devices

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

The following are non-fixed devices in MX-ONE.

- SIP - Mitel Phones (6800 and 6900 Series)
- SIP - Mitel Phones (6700 Series)
- SIP - Third-party (3PP) Phones
- SIP - DECT
- SIP - ATA (Analog Terminal Adapters - Mitel TA7100 family)
- Integrated DECT (requires a board in the MX-ONE Chassis)
- IP-DECT - ASCOM
- Wi-Fi Phone
- H.323 (IP Phones)
- InAttend - Client
- Soft client - MiCollab - SIP

- CTI client - MiCollab - Controlling SIP Device
- WebRTC client

Collecting Data (Non-fixed Devices)

For non-fixed devices, the MX-ONE logic checks for the Geo-location, BSSID, MAC address, ELIN/CESID, and the IP address provided by the device. For BSSID, the MAC address, and IP address, additional information must be added in the MX-ONE's Emergency Location database to complement the information received from the device. The system administrator needs to add additional information manually in the system.

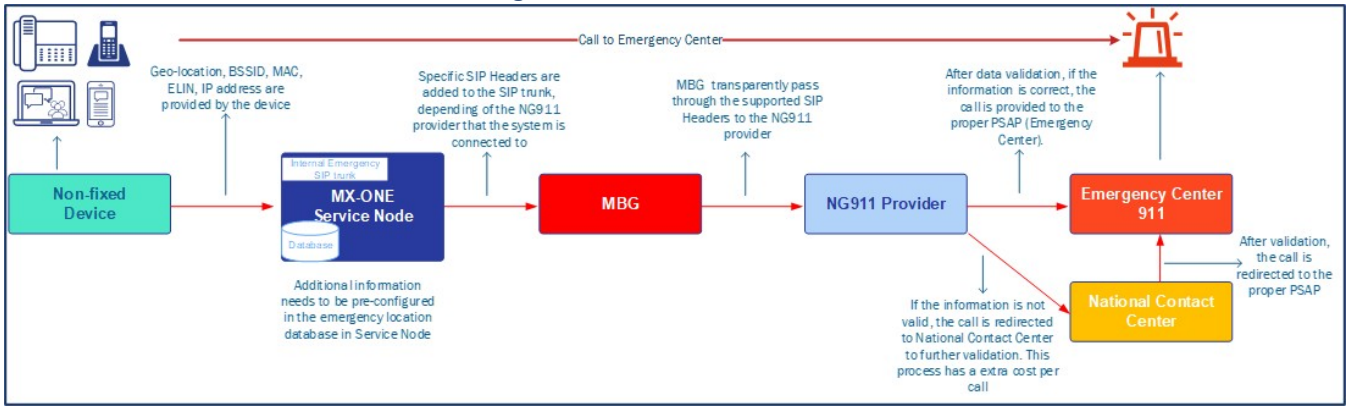
NOTE: Using the `dect_rfp` command, MX-ONE can be configured to provide the base station location information via the Location ID set up for Integrated DECT (legacy TDM DECT). The system administrator must add this information in the MX-ONE system.

NOTE: For SIP phones using ELIN/CESID via LLDP_MED protocol, the ELIN/CESID configuration must be done in the LAN switches by the customer system administrator.

NOTE: For SIP-DECT and IP-DECT, the ELIN/CESID configuration must be done in each base station by the customer system administrator.

NOTE: For Wi-Fi phones, the customer system administrator must use the WinPDM tool to configure the device parameter Emergency call location method to send BSSID in the SIP Invite.

Figure 3.2: Non-Fixed Devices Call Flow



Sending Data to the Intrado

After MX-ONE has collected all information from the device side in the call setup, based upon the MX-ONE SIP trunk configuration, which is different for each NG911 service provider, it will insert the information needed to be sent in the SIP trunk, including the appropriate SIP headers as required, to the Intrado provider via the MBG.

NOTE: MX-ONE sends HELD devices information transparently to Intrado. However, if the full DID numbers are not available, MX-ONE can add the callback number (configuration is required) to be sent to Intrado.

To conclude the process, the NG911 service provider validates the information received and will take the appropriate action. If all data is correct, the call is sent directly to the PSAP (Emergency Center). If not, then the call is redirected to the NG911 vendor's National Call Center for further triage, in which case the end-user may incur an extra charge.

NOTE: MX-ONE will always route the call to the ERS irrespective of whether there is a correct location data or not (assuming that the routing is configured correctly).

Fixed Devices (Legacy TDM Devices)

A fixed device is defined as a device that cannot be moved to another location in the enterprise without assistance from a professional installer or network manager. These are typically TDM devices such as an analog set.

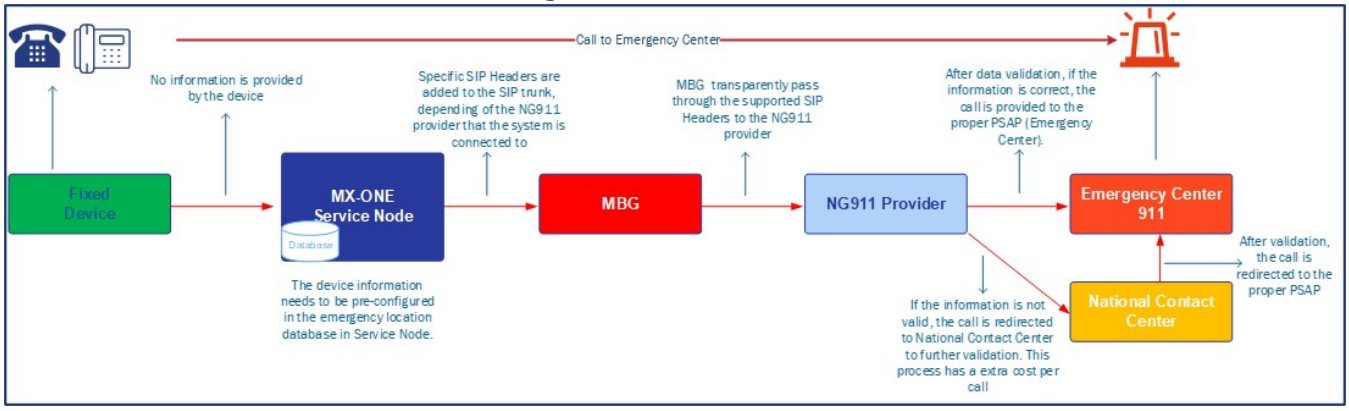
The following are the fixed devices in MX-ONE.

1. Analog – ATS (it requires a board in the MX-ONE chassis).
2. Digital – DTS (it requires a board in the MX-ONE chassis).

Collecting Data (Fixed Devices)

For fixed devices, the MX-ONE logic checks for information in the Emergency Location database because of no information is provided by the device. The system administrator must provide this information for these devices.

Figure 3.3: Fixed Devices Call Flow



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To conclude the process, the NG911 service provider validates the information received and will take the appropriate action. If all data is correct, the call is sent directly to the PSAP (Emergency Center). If not the call is redirected to the NG911 vendor's National Call Center for further triage, in which case the end-user might incur an extra charge.

NOTE: MX-ONE will always route the call to the ERS irrespective of whether there is a correct location data or not (assuming that the routing is configured correctly).

MX-ONE RAY BAUM Integration with Intrado - Configuration Guidelines

MX-ONE Emergency Services Configuration when using Intrado

SIP Trunk Profiles

MX-ONE supports SIP trunk profiles, which are predefined configuration files containing specific setup for SIP trunk providers.

For the USA emergency service solution (RAY BAUM), there is a pre-defined SIP trunk profile for connecting to the Intrado NG911 service provider.

The SIP trunk profile contains the SIP headers needed for each solution. These SIP headers are available in the North America Application System.

The Intrado SIP headers supported by MX-ONE are:

- FROM – it will transport a valid DID (10-digit dialable number) or Location ID/ELIN/CESID.
- E911-Organization-ID – it will transport the Intrado Account ID or Sub-Account ID, used mainly when customer groups are configured in MX-ONE system.
- PAI – it will transport the callback number.
- E911-User-Info – optional, it will transport IP address.

The SIP headers are added depending on how the system is configured.

Emergency Location Database

The MX-ONE Service Node contains an Emergency Location database, which is used to store the data used by the emergency service solution in the MX-ONE.

The data is required as an input and is required by the NG911 service provider to identify a device in MX-ONE side. The data is sent by MX-ONE via SIP trunk headers to Intrado.

The emergency location has the data structure shown in the following table.

Table	Description	Additional information
Location ID (LocationId) Table	Contains information such as Customer ID, Callback Number, and general information.	• The Location ID is a reference or identification used to identify a device in MX-ONE. This reference is then sent as an alternative ID instead of an ELIN/CESID in case a full DID number cannot be sent to the NG911 service provider. For example, in a hotel or for enterprise customers where extensions do not have a dialable number. • The Customer ID is required by the NG911 service providers to identify the customer associated with that call. • The callback number is required by the NG911 service providers if a full DID number (a 10-digit dialable number) is not sent. For example, in a hotel or for enterprise customers where extensions do not have a dialable number.
BSSID Table	Contains information that associates Location ID with BSSID (Access Point Information for Wi-Fi phones) or MAC addresses (SIP Phone) information.	• The BSSID is required to identify which Wi-Fi access point, a wireless device, is connected when an emergency call is made. The BSSID is associated with a Location ID. • The MAC address is optionally used to identify which SIP Phone was used to make an emergency call. The MAC address is associated with a Location ID. It is mainly used in Teleworker mode. • It can also be used in conference rooms and corridor phones.
DIR Table	Contains information that associates Location ID with a Directory Number (extension).	• It can be used for fixed devices and in some specific cases with non-fixed devices, such as H.323 phones, third-party SIP phones or ATA (Analog Terminal Adapters).

Table	Description	Additional information
LIM Table	Contains information that associates Location ID with a specific Service Node (LIM) or all Service Nodes (LIM).	• The LIM table can be used in some customer scenarios, where many devices (SIP, IP, analog, and digital phones) reside in the same physical location (or same building floor).
Customer Group Table	Contains information that associates MX-ONE customer groups (multi-tenant/CUST) with NG911 service provider Customer ID.	• It is used to associate an MX-ONE customer group (CUST) with the NG911 Customer ID. It can also contain a callback number to be used by the MX-ONE customer setup. • Customer group 0 is the default, and all extensions will be assigned to this group if no other customer group is specified. • One entry can be specified by each customer group used by the systems (including customer group 0). **NOTE:** Using the customer group setup simplifies the MX-ONE configuration, because it does not require that the Customer ID parameter is configured for each entry in the Location ID table. **NOTE:** If Customer ID is defined in both the Location ID table and the customer group table, the customer ID in the Location ID table has higher priority.

To define Emergency Location, the following setup is required:

- The Customer ID required by Intrado to unique identify a customer. The E911-Organization-ID is the SIP header used to transport the Customer ID to Intrado.

  NOTE: It is mainly used when sub-accounts are defined in Intrado portal and customer groups are defined in MX-ONE.
- The Location ID required by Intrado in case of a full DID number is not sent. The “FROM” is the SIP header used to transport the Location ID or an ELIN/CESID to Intrado.
- The Callback Number required by Intrado in case of a full DID (10-digit dialable number) number is not sent. The P-Asserted-Identity “PAI” is the SIP header used to transport the callback number to Intrado.
- The BSSID required to identify in which access point, a Wi-Fi device is connected when an emergency call is made. The BSSID is associated with a Location ID in the MX-ONE emergency location database, and then the Location ID is sent to Intrado. The “FROM” is the SIP header used to transport the Location ID to Intrado.

- The MAC address required to identify which SIP Phone was used to make an emergency call. The MAC address is associated with a Location ID in the MX-ONE emergency location database and then the Location ID is sent to Intrado. The “FROM” is the SIP header used to transport the Location ID to Intrado.
- The Directory number (DIR) associated with a Location ID in the MX-ONE emergency location database and then the Location ID is sent to Intrado. The “FROM” is the SIP header used to transport the Location ID to Intrado. It can be used for fixed devices and in some cases with non-fixed devices, such as H.323 phones, third-party SIP phones or ATA (Analog Terminal Adapters).

IP Domain

A subnet domain or IP address can be used to identify the SIP phone that was used to make an emergency call; for example, when SIP Phones are located in a floor and they belong to the same IP subnet or domain.

In MX-ONE, the `ip_domain` command is used to associate a Location ID with a specific IP address or a subnet domain (IP range) for emergency calls. Then, the Location ID is sent to Intrado. The “FROM” is the SIP header used to transport the Location ID to Intrado.

The customer needs to pay attention to IP Domain usage where an IP subnet may refer to more than one dispatchable location as required by the RAY BAUM’S Act. In this scenario, a single IP domain might not be granular enough to meet the legal requirements.

Integrated DECT

When the Integrated DECT devices are used in the customer, the system can be configured to associate a Location ID with a base station. The `dect_rfp` command is used for creating a radio cell reference.

Access Code

Access code setup is required for proper route selection. For example, 911 is the access code for the route to the NG911 emergency service provider. Configuration must allow for 911 to be dialed without prefix of suffix digit(s).

This setup is required to comply with Kari´s Law.

Number Conversion

Number conversion might be needed if number normalization is required for creating the proper DID number (10-digit dialable number).

Least Cost Routing

Least Cost Routing configuration might be needed depending on whether 911 is used as an access code or as an LCR code. Also, LCR configuration might be needed to convert 9911, and so on to 911 and route it to the NG911 service provider SIP trunk instead of to the public trunk.

NOTE: The number 933 must also be allowed for testing purposes.

Alternative Routing

If for some reason, the NG911 service provider is not reachable via the dedicated SIP trunk to the NG911 service provider, emergency calls must be routed to an emergency call center via the public PSTN lines connecting the MX-ONE system to the public network. In MX-ONE, this can be fulfilled by configuring Alternative Routing functionality on the dedicated NG911 SIP trunks. In this case, if the SIP trunks to the NG911 service providers are out of service, the system will route emergency calls via PSTN for further triage.

Intrado Integration - Setup Guidelines and Examples

Introduction

This chapter describes how MiVoice MX-ONE is integrated with the Intrado NG911 service provider. As a prerequisite, it is recommended that the engineer must first read the document MiVoice MX-ONE Emergency Services Description - Kari's Law and Section 506 of RAY BAUM'S Act available in MX-ONE CPI documentation for setting up the systems.

NOTE: Intrado offers a test number 933 to be used during the integration set up phase. It is recommended that the MX-ONE is set up with 933 until the full system integration and validation is completed.

MX-ONE System Setup - Routes, Number Conversion, Number Planning, and Least Cost Routing

The MX-ONE system needs to be configured to dial Emergency Services without any access code. For this, recommendations are:

- The SIP trunk profile to be used is “Intrado_E911_user_location”.
- When an emergency number 911 is dialed, the translation must lead to the emergency destination (in this case Intrado).
- When a public access code is followed by the emergency number (for example 9911), the translation must lead to the emergency destination (in this case Intrado).
- When public access code is followed by any other number (that is, a public number is dialed), the translation must lead to the usual public destination associated to the route to PSTN.

See *Operational Directions in MiVoice MX-ONE Emergency Calls*, *SOS Calls* for more information about setting up the emergency number; for example, call routing using Least Cost Routing.

Routes, Number Conversion, Number planning, and Least Cost Routing Examples

Number Planning

Preconditions for the integration test:

- Internal extension number range: 67000 to 67999.
- Public DID number range: 4856867000 to 4856867999.
- Destination code for the Intrado Emergency Route: 911 and 933 (used during the test validation).
- Default callback SOS --a number for logged off terminals: 67033.

NOTE: The configuration described here is only an example might need to be changed according to the customer number planning.

Emergency Route for 911 Call (internal route for SIP devices)

This route is used by MX-ONE to remove all SIP extensions services; for example, number restriction. Using this mechanism, MX-ONE can secure that the A-party is identified properly when an emergency call is made.

Emergency Route for 911 Calls Setup

ROCAI:ROU=901,SEL=7110000000000010,SERV=3110000001,SIG=0111101000A0,BCAP=001100, TRAF= 03151515,TRM=4;

RODAI:ROU=901,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;

sip_route -set -route 901 -profile MXONE-E911_keep_a -uristring0 sip:?@0.0.0.0 -accept EMERGENCY - match 911 -sosanumber 67033

ROEQI:ROU=901,TRU=1-1&&1-10;

Callback Number and Dest Code for Logged off Terminals

number_initiate -numbertype ED -number 67033
RODDI:ROU=901,DEST=67033,ADC=0505000000000250000000000100,SRT=1;

NOTE: D26=1 is required to make the callback to work.

See *Operational Directions in MiVoice MX-ONE Emergency Calls*, *SOS Calls* for more information about set up for calls from logged of terminals.

Route to Intrado Setup

There are two ways to set up the trunks between MX-ONE, MBG, and Intrado.

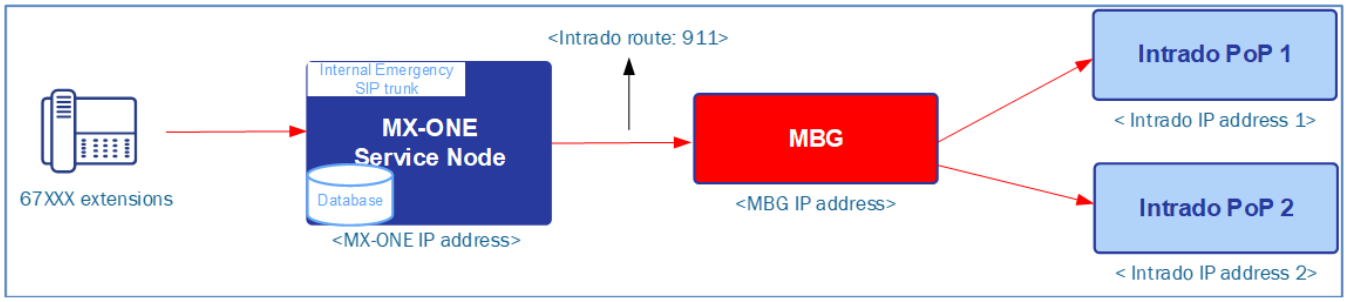
- Round Robin, which provides load-balancing between the Intrado point of presence.
- One dedicated route to each Intrado IP address (Point of Presence) using alternative routes.

SIP Route - Setup 1 - Using Round Robin to Intrado IP Addresses (Point of Presence)

The following figure shows the IP addresses used in the SIP trunk set up with Intrado. A route to Intrado was to be set up in MX-ONE.

The following information is required to set up the SIP trunk.

Figure 5.1: Setup 1



- **Intrado Gateway**: <Intrado IP address 1 and Intrado IP address 2>
- **MBG (sip proxy)**: <MBG IP address>
- **MX-ONE Service Node**: <MX-ONE Service Node IP address>

- **Account ID or Sub-Account ID from Intrado**: <Customer ID from Intrado>

Route to Intrado Using Round Robin

ROCAI:ROU=911,SEL=7110000000000010,SERV=3100000007,SIG=1111100000A0,BCAP=001100, TRAF= 03151515,TRM=5;

RODAI:ROU=911,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;

SIP Route to Intrado Using Round Robin (Non-Extension bind – callback number support)

The two IP addresses are defined in the route. The Round Robin mechanism in MX-ONE will send one call for each trunk.

sip_route -set -route 911 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>** -uristring0 sip:?@**<(Intrado IP address1|Intrado IP address2>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@<(Intrado IP address1|Intrado IP address2> -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** -accept NOT_USED -supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: accept NOT_USED prevents all incoming calls on a trunk.

SIP Route to Intrado Using Round Robin (Extension bind – callback number support)

The SIP trunk and MBG need to be configured to accept incoming calls for the Intrado´s Extension Bind – callback number to work.

NOTE: Be careful if this setup to avoid security issues. Mitel highly recommends the use of VPN between the customer site and Intrado.

The two IP addresses are defined in the route. The Round Robin mechanism in MX-ONE will send one call for each trunk.

sip_route -set -route 911 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>** -uristring0 sip:?@**<(Intrado IP address1|Intrado IP address2>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@<(Intrado IP address1|Intrado IP address2> -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** -accept REMOTE_IP -match **<MBG IP address>** -supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: accept = MBG IP address, it allows incoming calls on a trunk.

Number of Trunks in the Emergency Route to Intrado

In this example, 10 trunks are added in the Intrado route. The number of trunks used in this integration requires dimensioning. The dimensioning needs to be done according to the customer size and specific requirements.

ROEQI:ROU=911,TRU=1-1&&1-10;

RODDI:ROU=911,DEST=911,ADC=02270000000002500020011101 00,SRT=1;

RODDI:ROU=911,DEST=933,ADC=02270000000002500020011101 00,SRT=1;

Number Conversion

Number conversion setup is required for sending the number (the extension number) 67xxx to Intrado in National format.

The `Numbertype` parameter set as 10 (Internal directory number when sent to public network) is used for extensions and the `Numbertype` parameter set as 5 (Private Unknown) is used for calls via the emergency trunk.

Example: Configure the extension numbers 67xxx to fill up the 10-digit number (DID) in the emergency route 911.

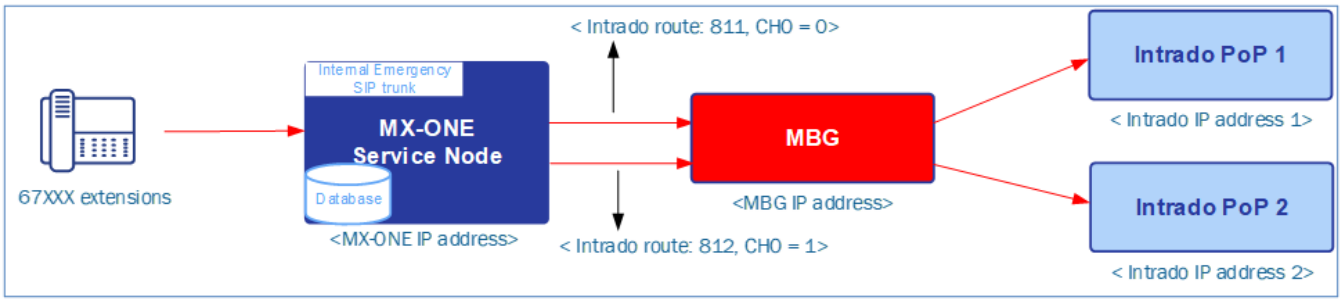
number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 10 -pre 48568 -route 911 -newtype 2

number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 5 -pre 48568 -route 911 -newtype 2

SIP Route – Setup 2 – One Dedicated Route to Each Intrado IP Address (Point of Presence) Using Alternative Route

The following figure shows the IP addresses used in the SIP trunk setup with Intrado. Two routes to Intrado were to be set up in MX-ONE.

Figure 5.2: Setup 2



The following information is required to set up the SIP trunk.

- **Intrado Gateway**: <Intrado IP address 1 and Intrado IP address 2>
- **MBG (sip proxy)**: <MBG IP address>
- **MX-ONE Service Node**: <MX-ONE Service Node IP address>
- **Account ID or Sub-Account ID from Intrado**: <Customer ID from Intrado>

Route to Intrado Point of Presence 1

ROCAI:ROU=811,SEL=7110000000000010,SERV=3100000007,SIG=1111100000A0,BCAP=001100, TRAF= 03151515,TRM=5;

RODAI:ROU=811,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;

The IP address of the Point of Presence 1 is used in the first route.

SIP Route to Intrado Point of Presence 1 (Non-Extension Bind – Callback Number Support)

sip_route -set -route 811 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>** -uristring0 sip:?@**<Intrado IP address1>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@**<Intrado IP address1>** -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** -accept NOT_USED -supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: accept NOT_USED to prevent all incoming calls on a trunk.

SIP Route to Intrado Point of Presence 1 (Extension Bind – Callback Number Support)

The SIP trunk and MBG need to be configured to accept incoming calls for the Intrado´s Extension Bind – callback number to work.

NOTE: Please be careful if this setup to avoid security issues. Mitel highly recommends the use of VPN between the customer site and Intrado.

sip_route -set -route 811 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>** -uristring0 sip:?@**<Intrado IP address1>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@<Intrado IP address1> -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** --accept REMOTE_IP -match **<MBG IP address>** -supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: accept = MBG IP address, it allows incoming calls on a trunk.

Route to Intrado Point of Presence 2

ROCAI:ROU=812,SEL=7110000000000010,SERV=3100000007,SIG=1111100000A0,BCAP=001100,

TRAF= 03151515,TRM=5;

RODAI:ROU=812,TYPE=TL66,VARC=00000000,VARI=00000000,VARO=00000000;

SIP Route to Intrado Point of Presence 2 (Non-Extension Bind – Callback Number Support)

The IP address of the Point of Presence 2 is used in the second route.

sip_route -set -route 812 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>** -uristring0 sip:?@**<Intrado IP address 2>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@**<Intrado IP address2>** -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** -accept NOT_USED -supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: -accept NOT_USED to prevent all incoming calls on a trunk.

SIP Route to Intrado Point of Presence 2 (Extension Bind – Callback Number Support)

The SIP trunk and MBG need to be configured to accept incoming calls for the Intrado´s Extension Bind – callback number to work.

NOTE: Be careful if this setup to avoid security issues. Mitel highly recommends the use of VPN between the customer site and Intrado.

sip_route -set -route 812 -profile Intrado_E911_user_location -protocol udp -proxyip **<MBG IP address>**-uristring0 sip:?@**<Intrado IP address 2>** -fromuri0 sip:?@**<MX-ONE Service Node IP address>** -uristring1 sip:+?@**<Intrado IP address2>** -fromuri1 sip:+?@**<MX-ONE Service Node IP address>** --accept REMOTE_IP -match <MBG IP address>-supervise ACTIVE_SUPERVISION -supervisetime 60

NOTE: - accept = MBG IP address, it allows incoming calls on a trunk.

Number of Trunks in the Emergency Route to Intrado

In this example, 10 trunks are added in the Intrado route. The number of trunks used in this integration requires dimensioning. The dimensioning needs to be done according to the customer size and specific requirements.

Individual Trunks to Intrado Point of Presence 1

ROEQI:ROU=811,TRU=1-1&&1-10;

RODDI:ROU=811,DEST=911,ADC=02270000000002500020011101 00,SRT=1,CHO=0;

RODDI:ROU=811,DEST=933,ADC=02270000000002500020011101 00,SRT=1,CHO=0;

Individual Trunks to Intrado Point of Presence 2

ROEQI:ROU=812,TRU=1-1&&1-10;
RODDI:ROU=812,DEST=911,ADC=02270000000002500020011101 00,SRT=1,CHO=1;
RODDI:ROU=812,DEST=933,ADC=02270000000002500020011101 00,SRT=1,CHO=1;

NOTE: The CHO parameter is used to define the second route as an alternative routing to route 1. In case Intrado is not reachable via the first SIP trunk, the emergency calls will be routed via the second route.

Number Conversion

Number conversion setup is required for sending the number (the extension number 67xxx) to Intrado in National format.

NOTE: The `Numbertype` parameter set as 10 (Internal directory number when sent to public network) is used for extensions and the `Numbertype` parameter set as 5 (Private Unknown) is used for calls via the emergency trunk.

Number Conversion to Intrado Point of Presence 1

number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 10 -pre 48568 -route 811 -newtype 2

number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 5 -pre 48568 -route 811 -newtype 2

Number Conversion to Intrado Point of Presence 2

number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 10 -pre 48568 -route 812 -newtype 2

number_conversion_initiate -entry 67 -conversiontype 1 -numbertype 5 -pre 48568 -route 812 -newtype 2

MX-ONE System Setup – IP Domain

IP Domain Setup

The `IP domain` command is used to associate a Location ID with a specific IP address or a subnet domain (IP range) for emergency calls.

IP subnet: **<my subnet 1>**

Location ID: **<my subnet 1 locationid>**

ip_domain -i --domain-name Building1 --ip-net **<my subnet 1>** --packetization-interval 20 --video-limit 100 --codec-priority-list PCMA,PCMU,G729AB,G729A,G722 --location-id **<my subnet 1 locationid>**

For emergency calls from logged terminals, the A-number must be sent to the emergency center that can be initiated for each domain and each LIM. See Operational Directions in *MiVoice MX-ONE Emergency Calls*, *SOS Calls* for more information.

MX-ONE System Setup - Emergency Location Database Setup

The emergency location database needs to be set up for the devices that do not provide Geolocation, ELIN, or a valid DID (10-digit number).

Intrado requires some data to make the solution work properly, and these data must be added in the MX-ONE emergency location database.

The following table shows the MX-ONE and the Intrado names for such data.

Table 5.1: Emergency Location Database

MX-ONE Name	Intrado Name	SIP Trunk Header Name
Customer ID	Account ID	E911-Organization-ID
Location ID	ERL ID	FROM
Callback Number	Callback Number	PAI

NOTE: If extension bind is not used, a callback number must be defined for non-DID numbers and can be configured in the MX-ONE emergency location database or in the Intrado web portal. The number configured in Intrado portal has higher priority than that set up in the MX-ONE. For example, an extension in a hotel room normally uses an internal number (non-DID number); in this case, the callback number shall be set up to the hotel DID reception (not to an IVR) or security desk DID number.

Account ID Definition

Intrado

Intrado requires a customer identifier for each emergency call which are part of sub-accounts (level 3 account) (Tenants/Customer group in MX-ONE). The customer identifier is provided by Intrado and it is called as Account ID in the Intrado portal. It can be found in the Intrado portal dashboard under General Information.

For standard accounts (layer 2 accounts) Intrado identifies the calls using Public IP addresses or FQDNs for the customer network.

The E911-Organization-ID SIP header is used to transport the Customer ID.

MX-ONE

In MX-ONE, the emergency location command is used to add the Customer ID (the Account ID from Intrado) in MX-ONE emergency location database.

The Customer ID in MX-ONE can be configured for each customer group or individually as part of a Location ID.

Customer Group

The Customer ID can be specified for each customer group in the emergency location database by using the parameter Customer ID.

The Customer ID defined for each customer group will be used in calls from extensions that belong to the customer group, when no Customer ID is configured for a Location ID.

If the Customer ID is configured as part of a customer group (Multi-tenant) in MX-ONE, all extensions that belong to that customer group will have the same Customer ID. The customer group is 0, the default and all extensions will be assigned to this group if no other customer group is specified.

One entry can be specified by each customer group used by the systems (including customer group 0).

Example:

When an extension belonging to a customer group makes an emergency call, MX-ONE will send the associated Customer ID in the E911-Organization-ID SIP header to Intrado.

Command Syntax:

```
emergency_location -i --customer 50 --customer-id 4ae5-
da2b-93e9-4e4c-bdd0-74316a36eae9
```

```
customer = customer group in MX-ONE
```

```
customer-id = Account ID defined in the Intrado portal
```

Individual - Location ID

The Customer ID can be specified individually in the emergency location database as part of a Location ID, parameter `Customer ID`.

The Customer ID defined individually will be used in calls from extensions using the Location ID for which the Customer ID is set up in the MX-ONE emergency database.

Example:

When a user makes an emergency call from an extension that is configured with the Location ID and associated with a Customer ID, MX-ONE will send the associated Customer ID in the E911-Organization-ID SIP header to Intrado.

NOTE: The individual Customer ID set up in the emergency database has higher priority than the Customer ID configured in the customer group. MX-ONE uses the former for calls.

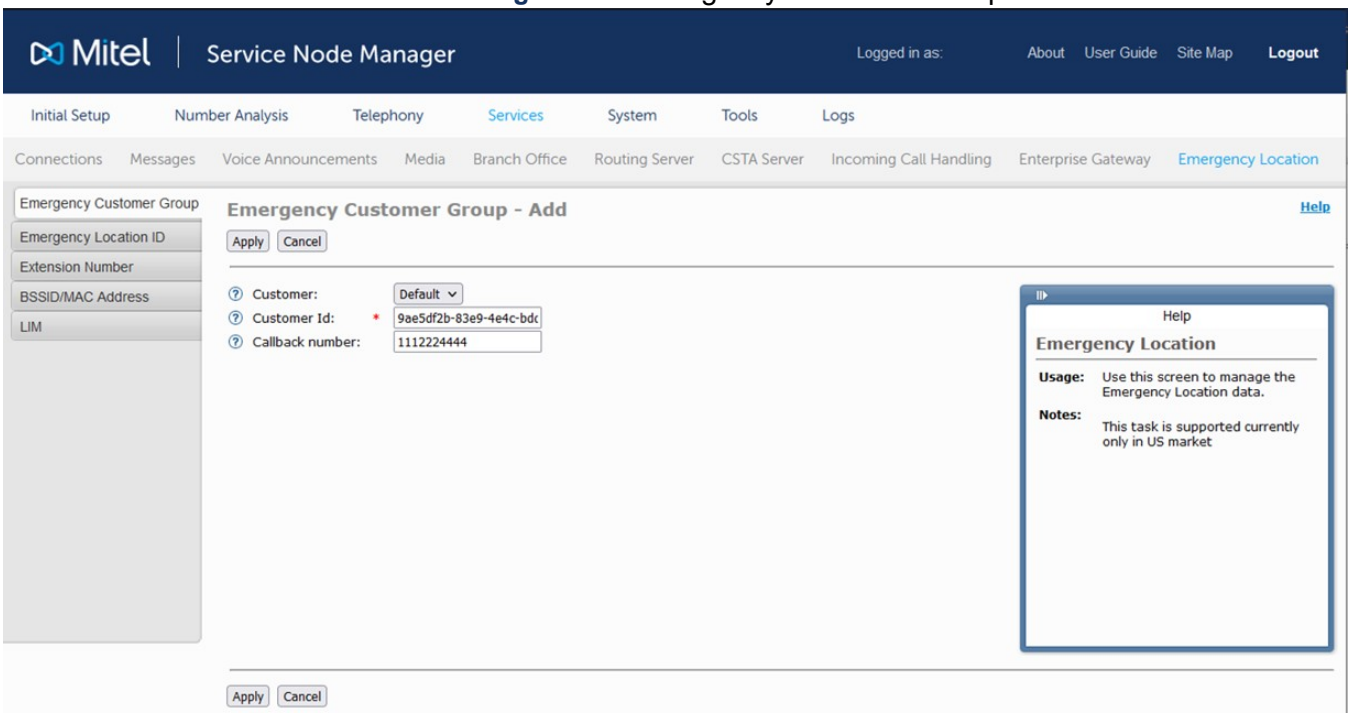
Add Customer ID to a Customer Group in MX-ONE

Emergency Customer Group (Service Node Manager)

To add a Customer ID to a customer group in MX-ONE Service Node Manager (SNM), do the following:

1. In SNM, go to **Services**> **Emergency Location** menu.
2. Select the **Emergency Customer Group**.

Figure 5.3: Emergency Customer Group



3. Add **Customer**, **Customer Id**, and **Callback number** and click **Apply**.

   NOTE: If there is no customer group defined in SNM, such as for Telephony, Groups, and Customer tasks, then only the default group will be displayed in the drop-down list.

4. If any customer groups are defined in the Service Node Manager as shown in the following figures, these will be displayed in the **Emergency Customer Group** task.

Figure 5.4: Customer

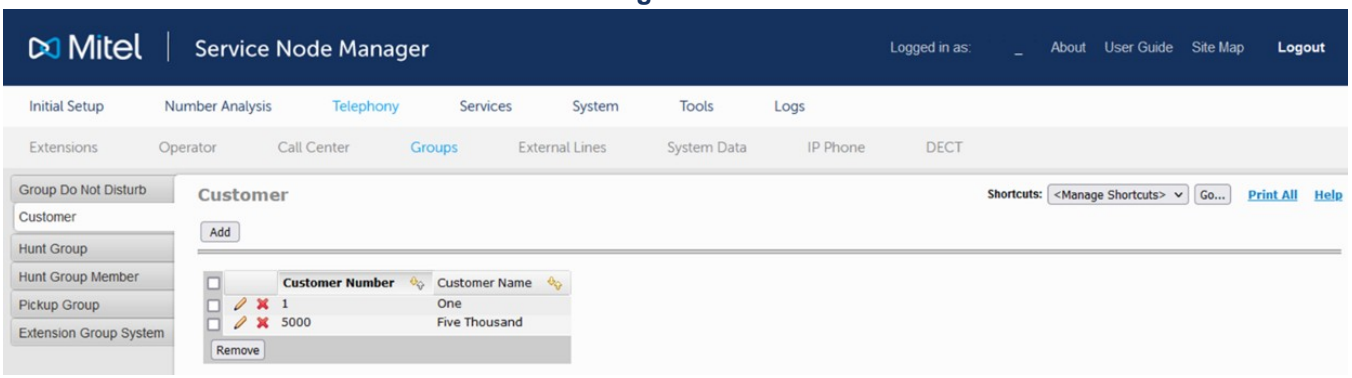
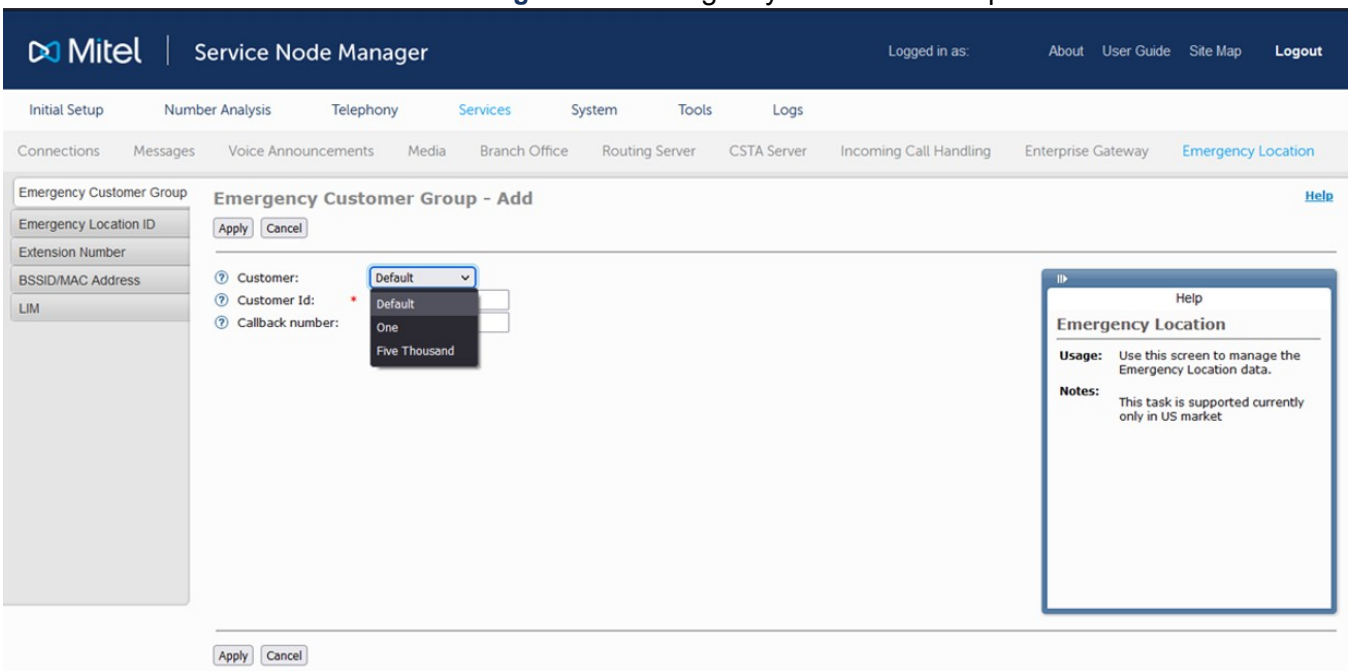


Figure 5.5: Emergency Customer Group



5. If additional Customer IDs are required, add the required information and click **Apply**.

MX-ONE Command Line Interface

Connect to MX-ONE via SSHv2 and initiate the Location ID using the MX-ONE Command Line Interface.

```
emergency_location -i --customer 0 --customer-id
9ae5df2b-83e9-4e4c-bdd0-74316e36eae6 --callback-number 1112224444
```

Figure 5.6: Emergency Customer Group Data Print

```
Emergency Customer Group Data print
Cust  Customer ID                                  Callback Number
0     9ae5df2b-83e9-4e4c-bdd0-74316e36eae6         1112224444
```

Add Location ID in MX-ONE

A location ID in MX-ONE is composed of three main parameters; Location ID, Customer ID, and Callback Number (optionally, Info parameter can be assigned).

- **Location ID** - used to identify the location identity; that is a building, site, campus, suite, room, or radio cell reference, and so on.
- **Customer ID** - Identifier of the customer who made an emergency call. In Intrado, this is the Account ID, and the information is available in the Intrado portal.
- **Callback Number** - Phone number to be used as the callback number sent to the Public Safety Answering Point.
- **Info** - parameter supplements the Location ID by providing the physical address of the location.

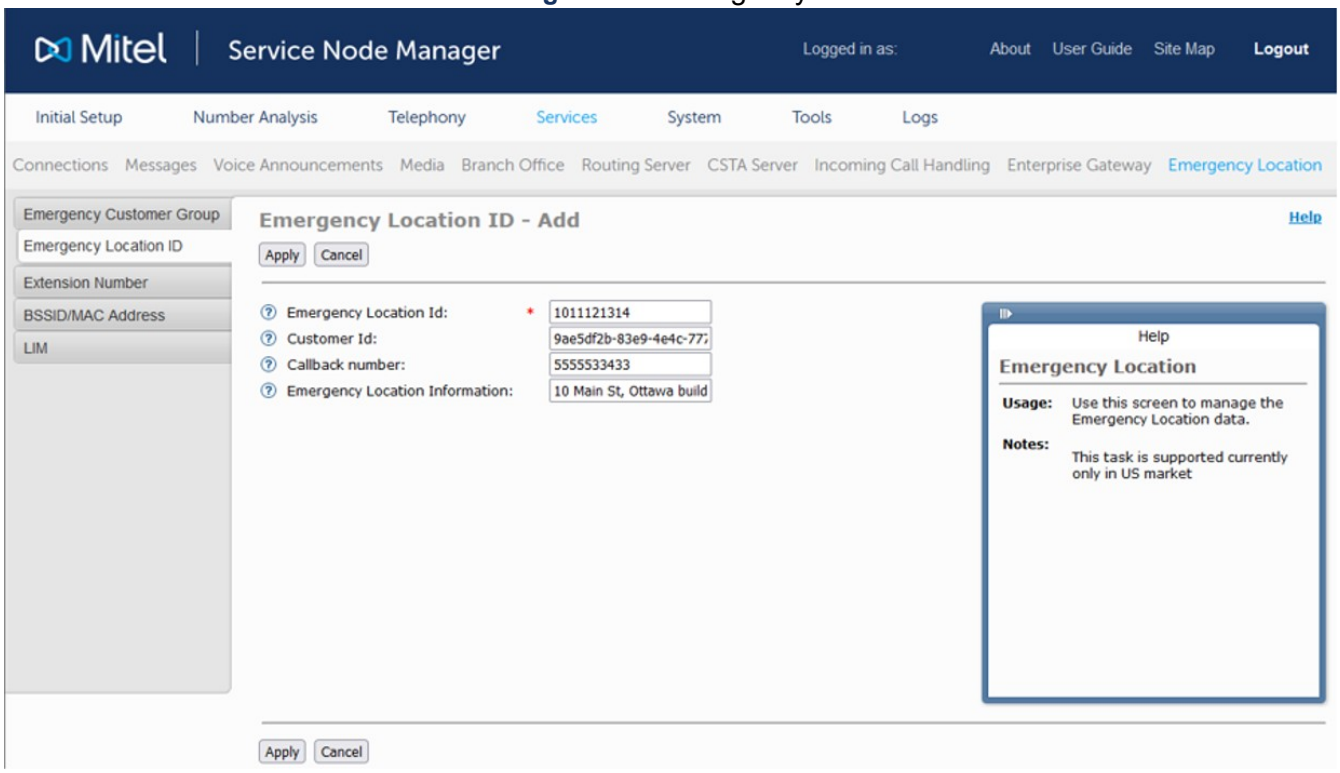
Initiate a Location ID and Associate it with a Mitel SIP 6940 Phone MAC Address

Emergency Location ID

To add an **Emergency Location ID** in MX-ONE SNM, do the following:

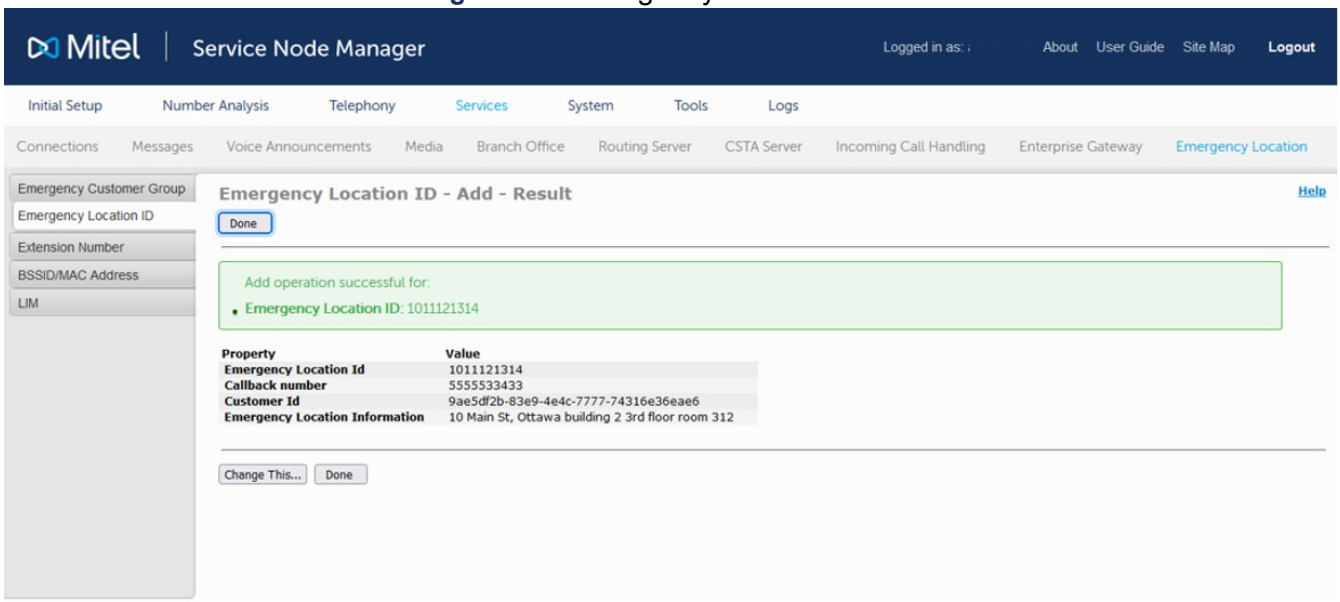
1. In SNM, go to **Services**> **Emergency Location** menu.
2. Select **Emergency Location ID**.

Figure 5.7: Emergency Location ID



3. Add the required information for **Emergency Location Id**, **Customer Id**, **Callback number**, and **Emergency Location Information** and click **Apply**. The Emergency Location ID is successfully added in MX-ONE SNM.

Figure 5.8: Emergency Location ID - Add - Result

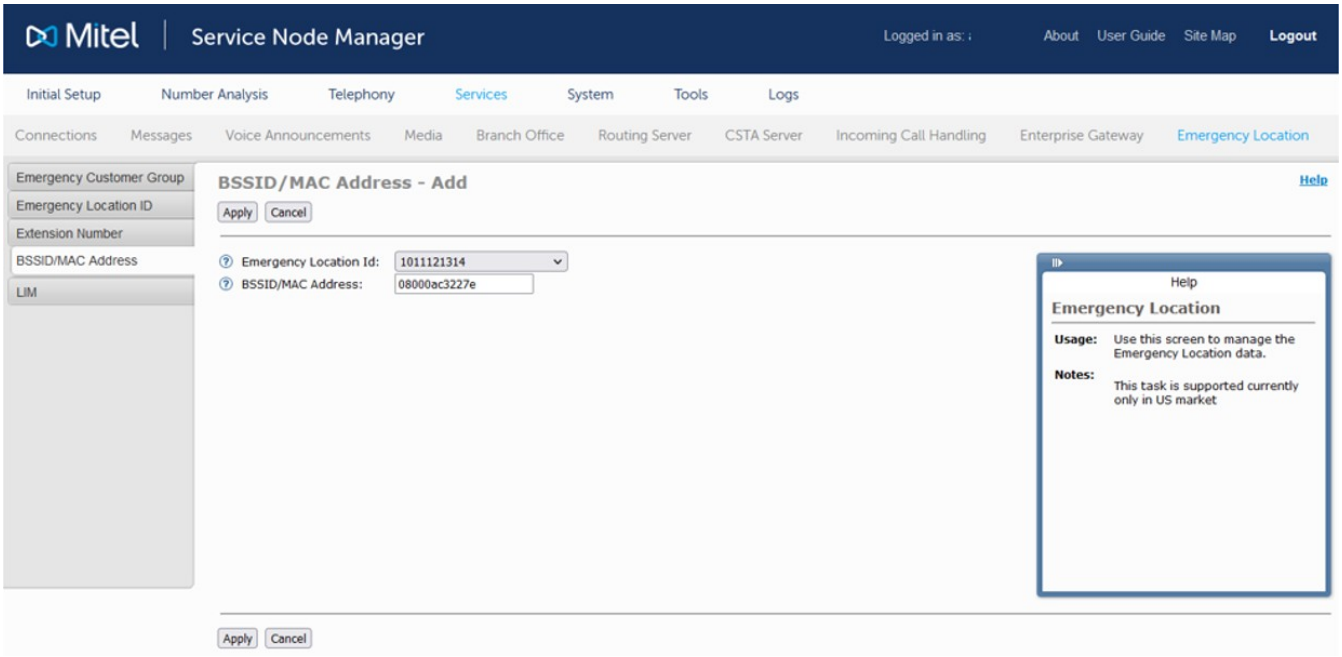


BSSID or MAC Address

Previously generated Location ID now can be associated to the SIP Phone MAC address (BSSID). To add BSSID or MAC address in MX-ONE SNM, do the following:

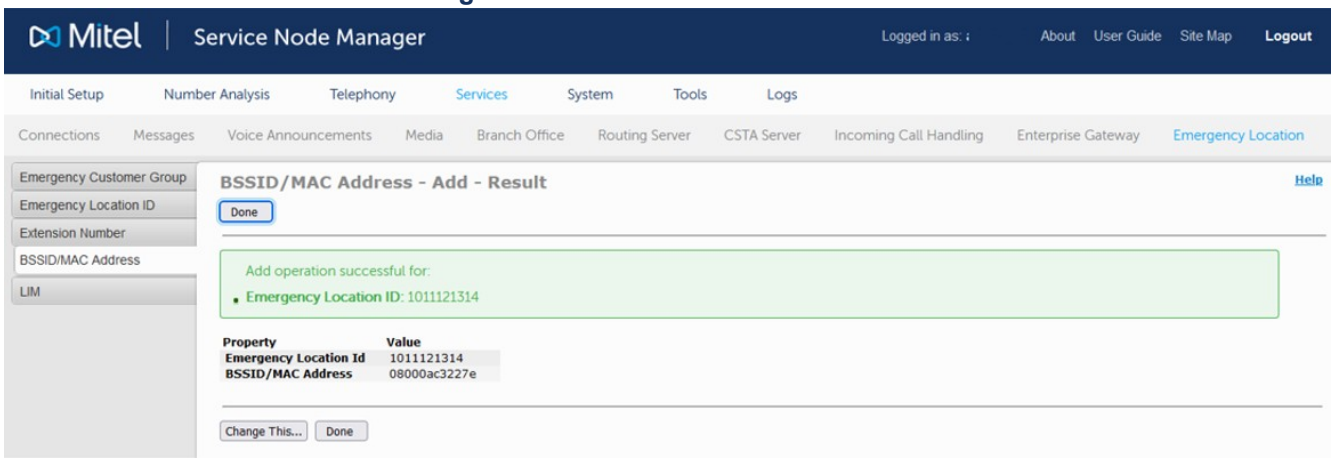
1. Select the **BSSID** or **MAC Address** with which to associate the Location ID.

Figure 5.9: BSSID/MAC Address



2. From the drop-down list, select the previously created **Emergency Location Id**, and then enter the **BSSID** or **MAC address** of the SIP Phone and click **Apply**.

Figure 5.10: BSSID/MAC Address - Add - Result



The **BSSID** or **MAC address** of the SIP Phone is successfully added.

MX-ONE Command Line Interface

Connect to MX-ONE via SSHv2 and initiate the Location ID using the MX-ONE Command Line Interface.

```
emergency_location -i --location-id 1011121314 --customer-id
9ae5df2b-83e9-4e4c-7777-74316e36eae6 --callback-number 5555533433 --info '10 Main St, Ottawa building 2 3rd floor room 312'
```

Figure 5.11: Emergency Location Id Data print

```
Emergency Location Id Data print
Location Id     : 1011121314
Customer Id     : 9ae5df2b-83e9-4e4c-7777-74316e36eae6
Callback Number : 5555533433
Info            : 10 Main St, Ottawa building 2 3rd floor room 312
```

This Location ID now can be associated with the SIP Phone MAC address (BSSID). To do this, execute the following command:

```
emergency_location -i --location-id 1011121314 --bssid 08000ac3227e
```

Figure 5.12: Emergency Location BSSID print

```
Emergency Location BssId print
BssId                    Location Id
08000ac3227e             1011121314
```

Example 1: In this example, if the user makes an emergency call using the SIP phone, which has the MAC address 08000ac3227e, MX-ONE will add the Location ID 1011121314 in the “FROM” header in the SIP trunk connected to Intrado. The E911-Organization-ID and “PAI” headers will also be added in the SIP Invite to the Intrado, because emergency call was defined individually to the Location ID.

- **FROM**: 1011121314
- **E911-Organization-ID**: 9ae5df2b-83e9-4e4c-7777-74316e36eae6
- **PAI**: 5555533433

Initiate a Location ID and Associate it with a Range of Directory Numbers (Dir); Extensions are Digital or Analog Phones

Extension Number

1. In SNM, go to **Services**> **Emergency Location** menu. Add the required information for the **Emergency Location Id** task and click **Apply**.

Figure 5.13: Emergency Location ID

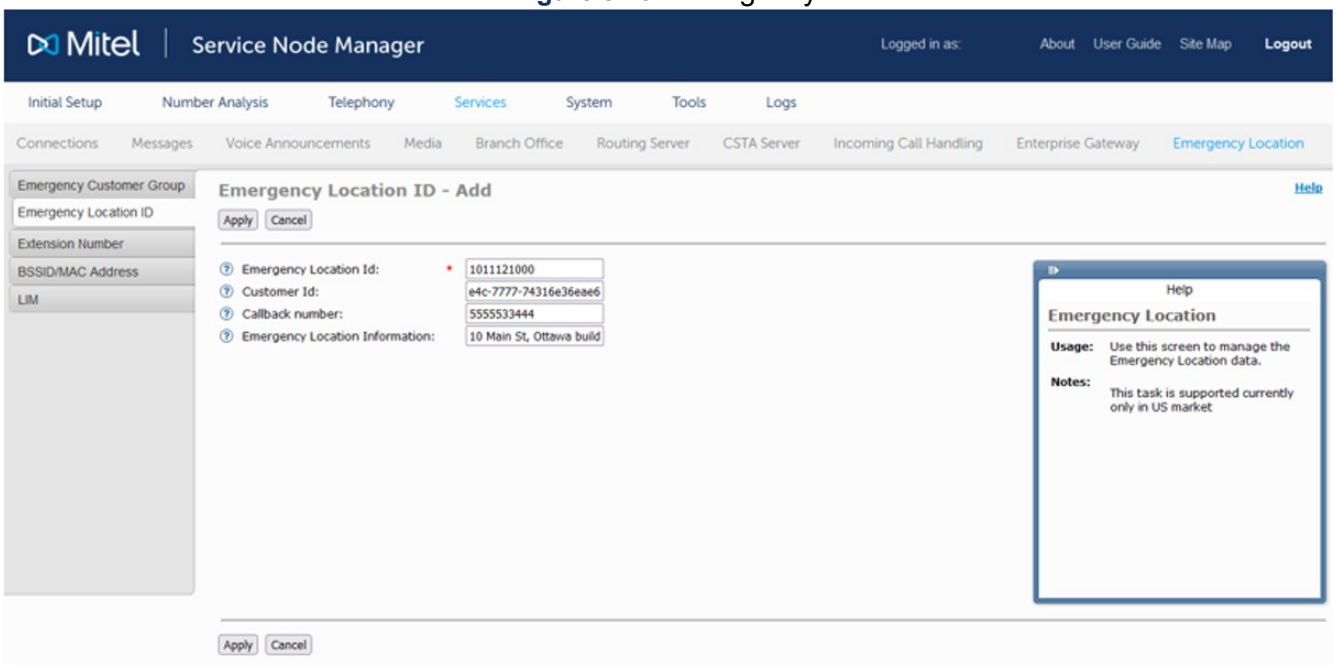
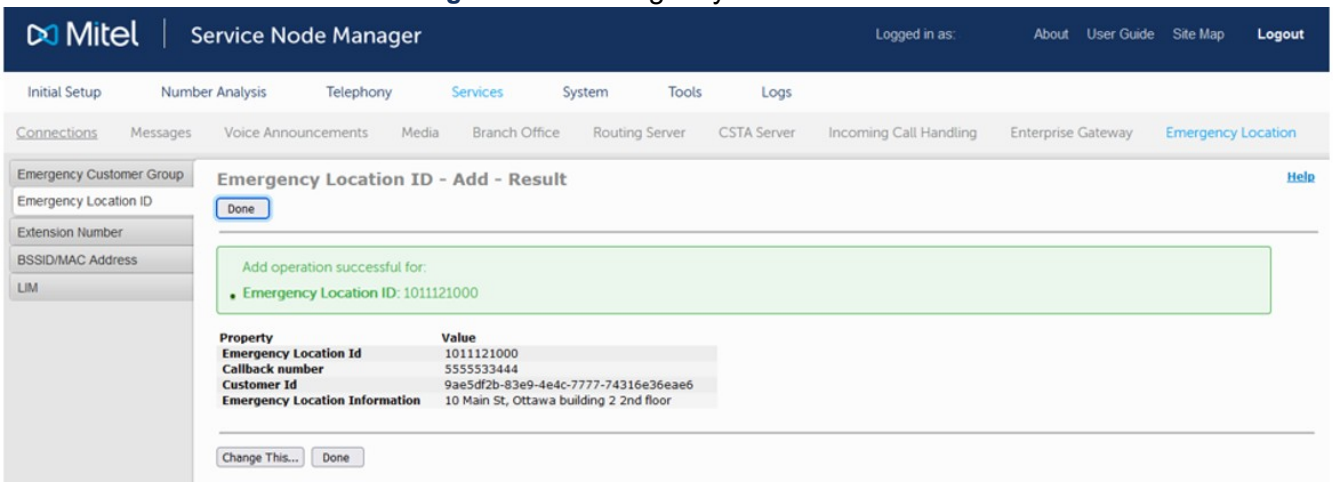
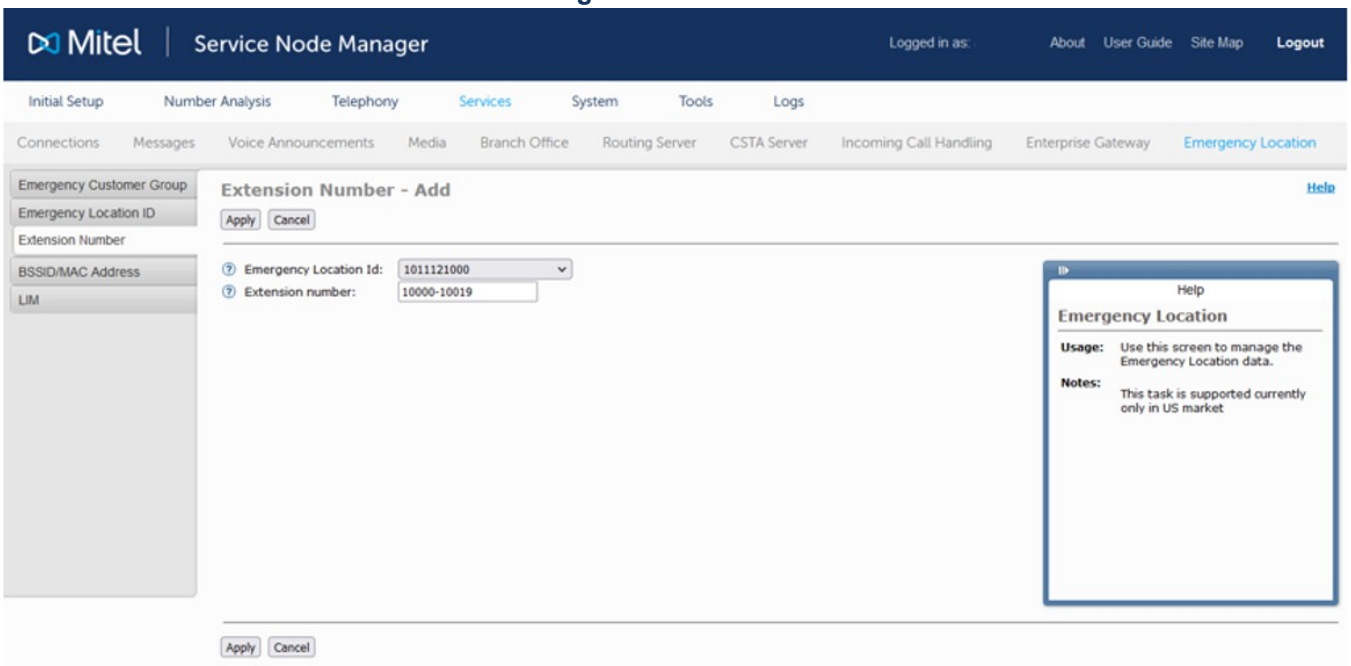


Figure 5.14: Emergency Location ID - Add - Result



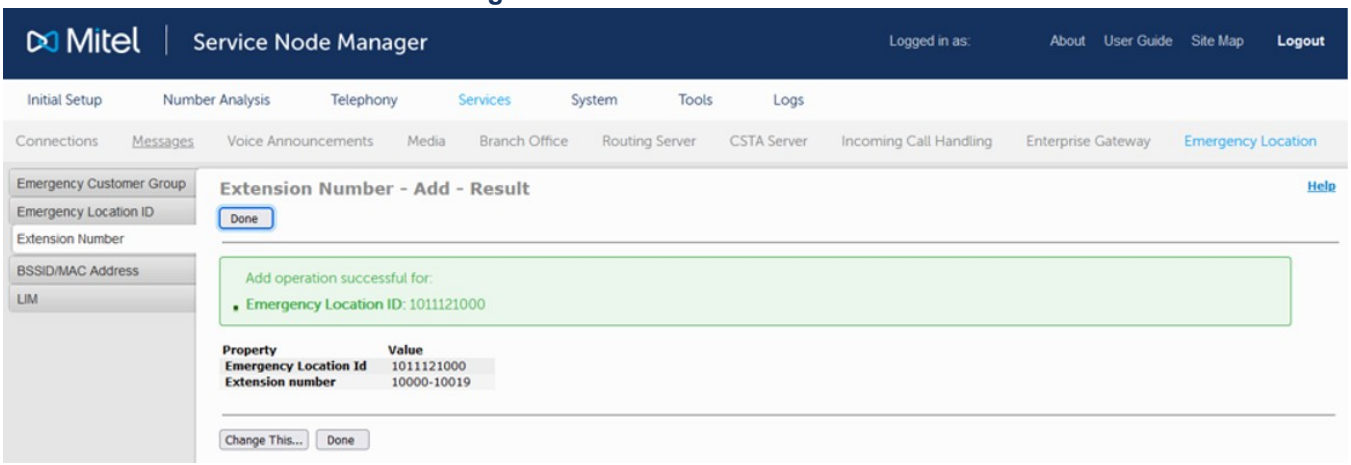
2. Select the **Extension Number** task to associate it to a range of extension numbers. This Location ID now can be associated to a range of extension numbers.

Figure 5.15: Extension Number



3. From the drop-down list, select the previously created **Emergency Location Id** and enter a range of extension numbers (for example, extensions 10000 up to 10019) and click **Apply** to associate the Location ID with this range of extension numbers.

Figure 5.16: Extension Number - Add -Result



The **Extension Number** is successfully added.

MX-ONE Command Line Interface

Connect to MX-ONE via SSHv2 and initiate the Location ID using the MX-ONE Command Line Interface.

```
emergency_location -i --location-id 1011121000 --customer-id
9ae5df2b-83e9-4e4c-7777-74316e36eae6 --callback-number 5555533444 --info '10 Main
St, Ottawa building 2 2nd floor'
```

Figure 5.17: Emergency Location Id Data print

```
Emergency Location Id Data print
Location Id      : 1011121000
Customer Id      : 9ae5df2b-83e9-4e4c-7777-74316e36eae6
Callback Number  : 5555533444
Info             : 10 Main St, Ottawa building 2 2nd floor
```

This Location ID now can be associated with a range of extension numbers, for example extension numbers 10000 to 10019.

To associate the Location ID with a range of extensions numbers, execute the following command:

```
emergency_location -i --location-id 1011121000 --dir 10000..10019
```

Figure 5.18: Emergency Location Directory Data print

```
Emergency Location Directory Number print
Dir                    Location Id
10000                  1011121000
10001                  1011121000
10002                  1011121000
10003                  1011121000
10004                  1011121000
10005                  1011121000
10006                  1011121000
10007                  1011121000
10008                  1011121000
10009                  1011121000
10010                  1011121000
10011                  1011121000
10012                  1011121000
10013                  1011121000
10014                  1011121000
10015                  1011121000
10016                  1011121000
10017                  1011121000
10018                  1011121000
10019                  1011121000
```

Example 1: In this example, if the user makes an emergency call using one of the extensions configured with the Location ID 1011121000, MX-ONE will add the Location ID 1011121000 in the “FROM” header in the SIP trunk connected to Intrado. The E911-Organization-ID and “PAI” headers will also be added in the SIP Invite to the Intrado, because these were defined individually for the Location ID.

1. **FROM**: 1011121000
2. **E911-Organization-ID**: 9ae5df2b-83e9-4e4c-7777-74316e36eae6
3. **PAI**: 5555533444

Initiate a Location ID and Associate it with a Service Node

LIM

1. In SNM, go to the **Services**> **Emergency Location** menu. Add the required information for the **Emergency Location Id** task and click **Apply**.

Figure 5.19: Emergency Location ID

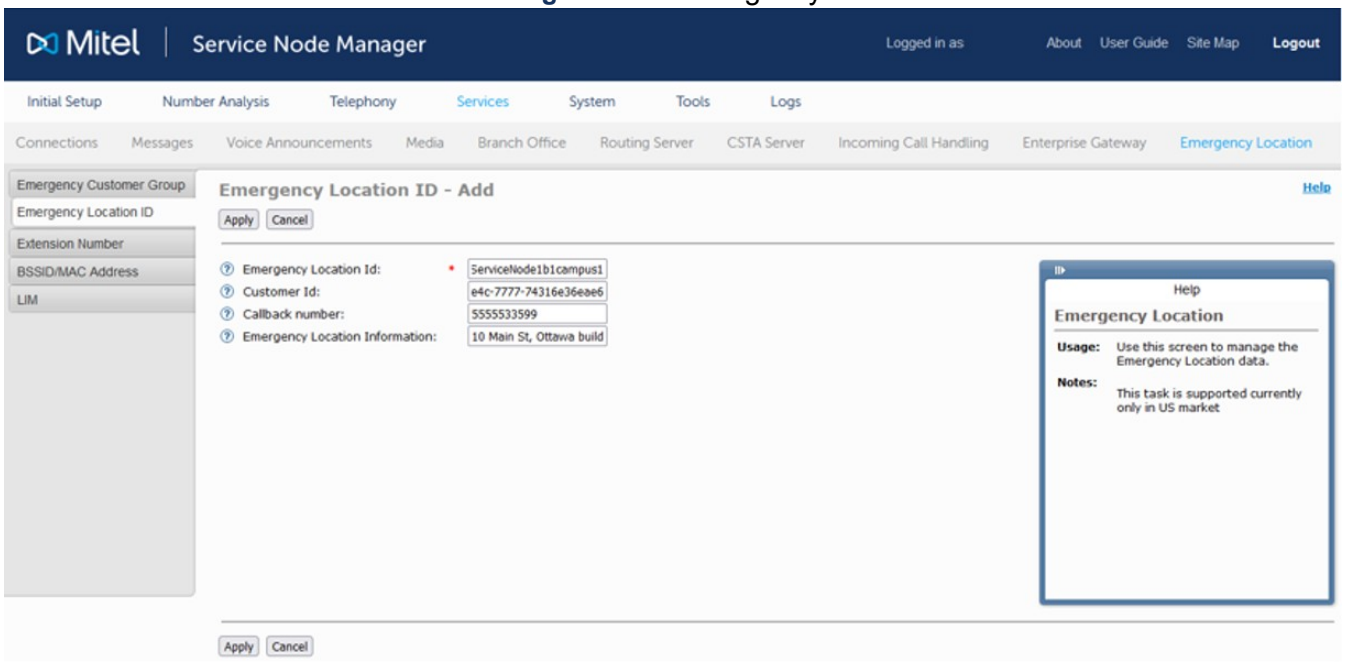
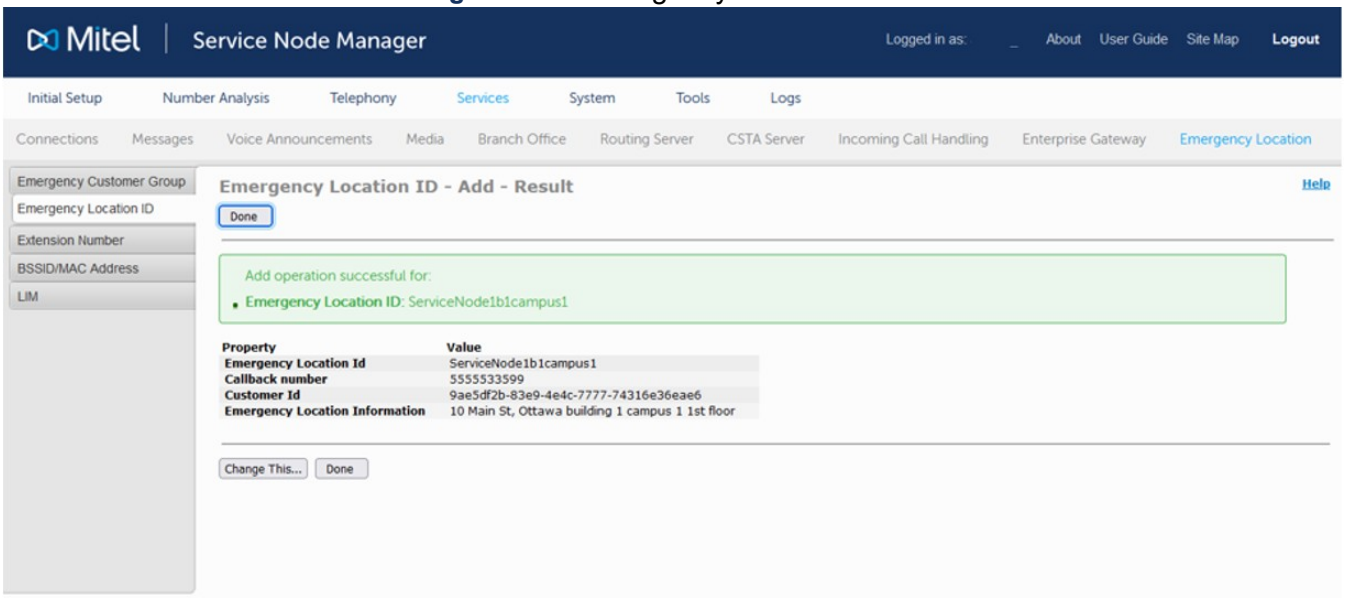


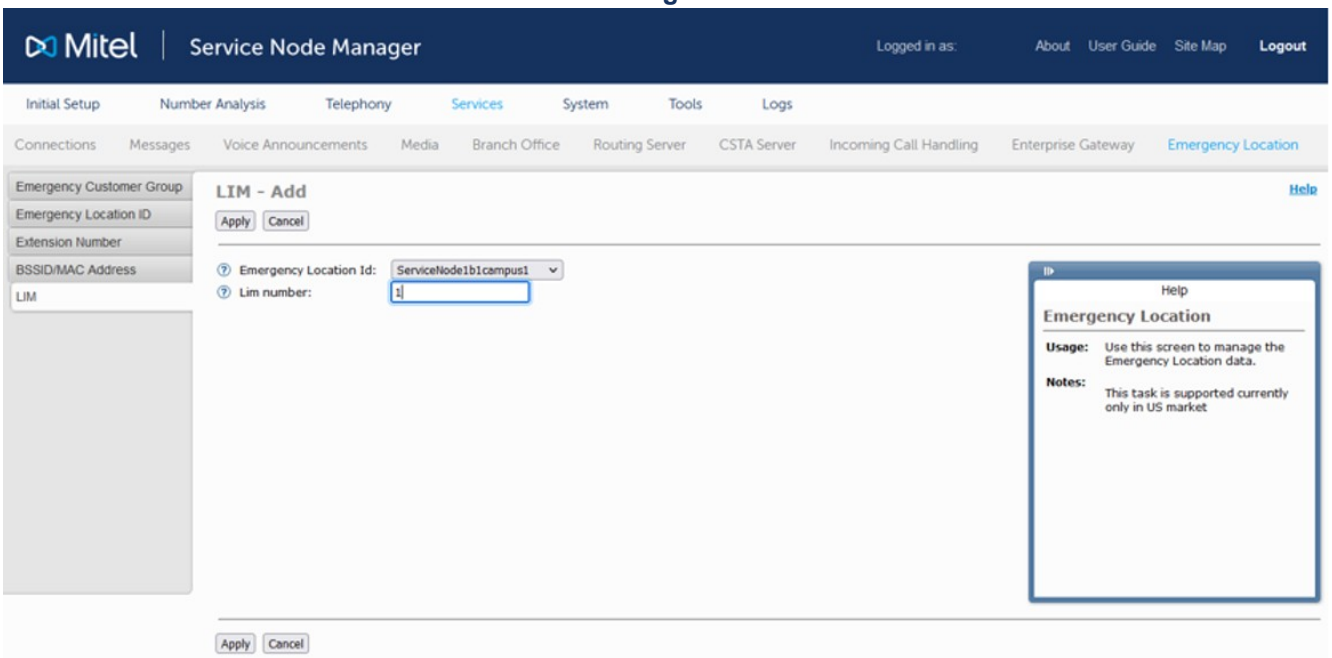
Figure 5.20: Emergency Location ID - Add - Result



This Location ID now can be associated to a Service Node.

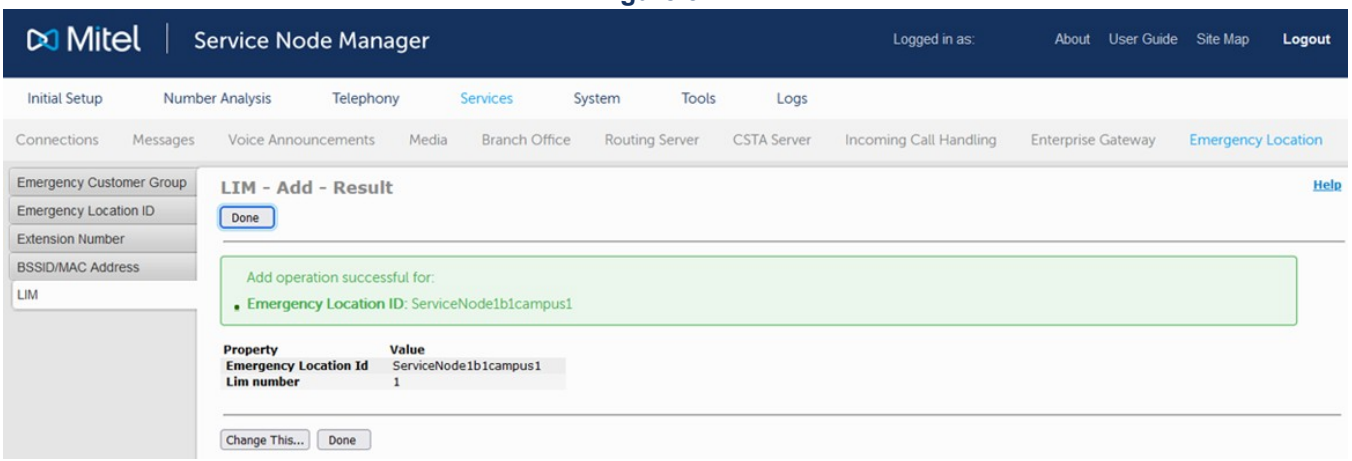
2. Select the **LIM** task to associate with a Service Node.

Figure 5.21: LIM



3. From the drop-down list, select the previously created **Emergency Location Id** to be associated with a Service Node number (for example, Service Node 1 (LIM 1)), and click **Apply**.

Figure 5.22: Add -Result



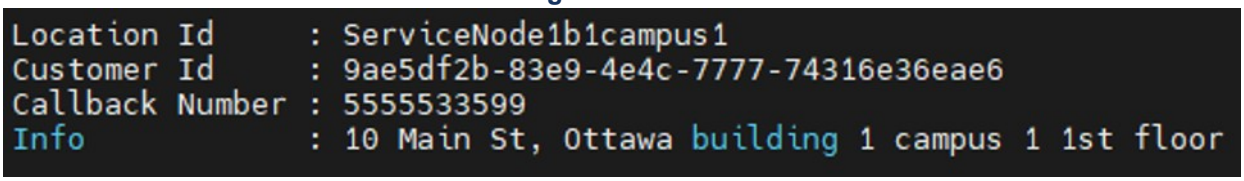
The LIM number is successfully added.

MX-ONE Command Line Interface

Connect to MX-ONE via SSHv2 and initiate the Location ID using the MX-ONE Command Line Interface.

```
emergency_location -i --location-id ServiceNode1b1campus1 --customer-id
9ae5df2b-83e9-4e4c-7777-74316e36eae6 --callback-number 5555533599 --info '10 Main
St, Ottawa building 1 campus 1 1st floor'
```

Figure 5.23: Service Node1

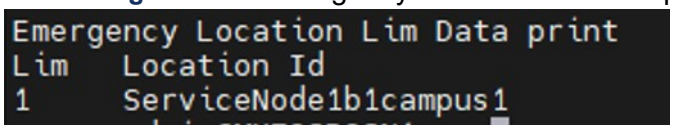


This Location ID now can be associated to a Service Node.

To associate the Location ID to Service Node 1, execute the following command:

```
emergency_location -i --location-id ServiceNode1b1campus1 --lim 1
```

Figure 5.24: Emergency Location LIM Data print



Example 1: In this example, all extensions in Service Node 1 will be associated with the Location ID ServiceNode1b1campus1 if no other information is configured in the system.

If a user makes an emergency call using one of the extensions (that belongs to Service Node 1 the Location), MX-ONE will add the Location ID ServiceNode1b1campus1 in the “FROM” header in the SIP trunk connected to Intrado. The E911-Organization-ID and “PAI” header will also be added in the SIP Invite to the Intrado, because these were defined individually for the Location ID.

- **FROM**: ServiceNode1b1campus1
- **E911-Organization-ID**: 9ae5df2b-83e9-4e4c-7777-74316e36eae6
- **PAI**: 5555533599

NOTE: If LIM = 0 is used, all Service Nodes will use the same Location ID.

Traditional DECT Set up

Ensure that the DECT system is already set up and in place. The only change that is required is in the `dect_rfp` command as shown below.

```
dect_rfp
```

In the `dect_rfp` the location ID can be initiated.

Example 1: In this example, the user needs to add the location-id information on RFP 1 on Common Fixed Part 3.

```
dect_rfp -i --fpi 3 --rpn 1 --location-id "1129111129"
```

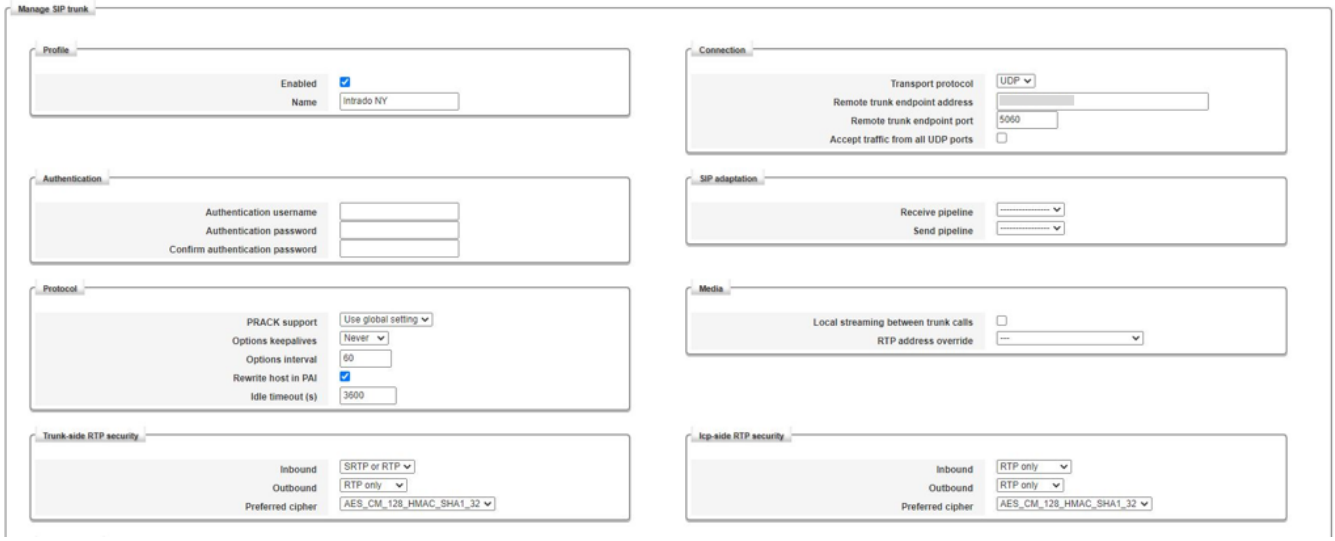
MBG Setup

The integration between MX-ONE and Intrado requires an MBG. The MBG is set up as a proxy between MX-ONE and Intrado. SIP trunks are set up in the MBG; one or two internal between MX-ONE and MBG and two between MBG and Intrado Point of Presences.

For information about setting up these, see the SIP trunks in MBG, chapter *SIP Trunking of MBG Installation and Maintenance Guide*.

SIP Route to Intrado - (Non-Extension bind – Callback Number Support)

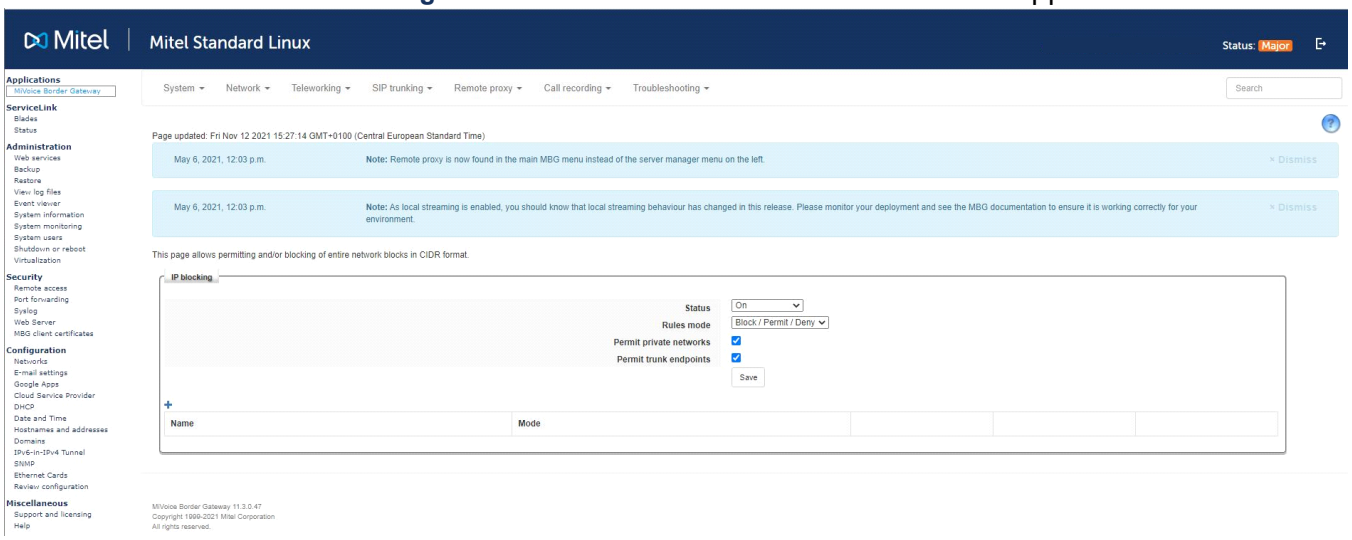
Figure 6.1: Non-Extension bind – Callback Number Support



SIP Route to Intrado - (Extension bind – Callback Number Support)

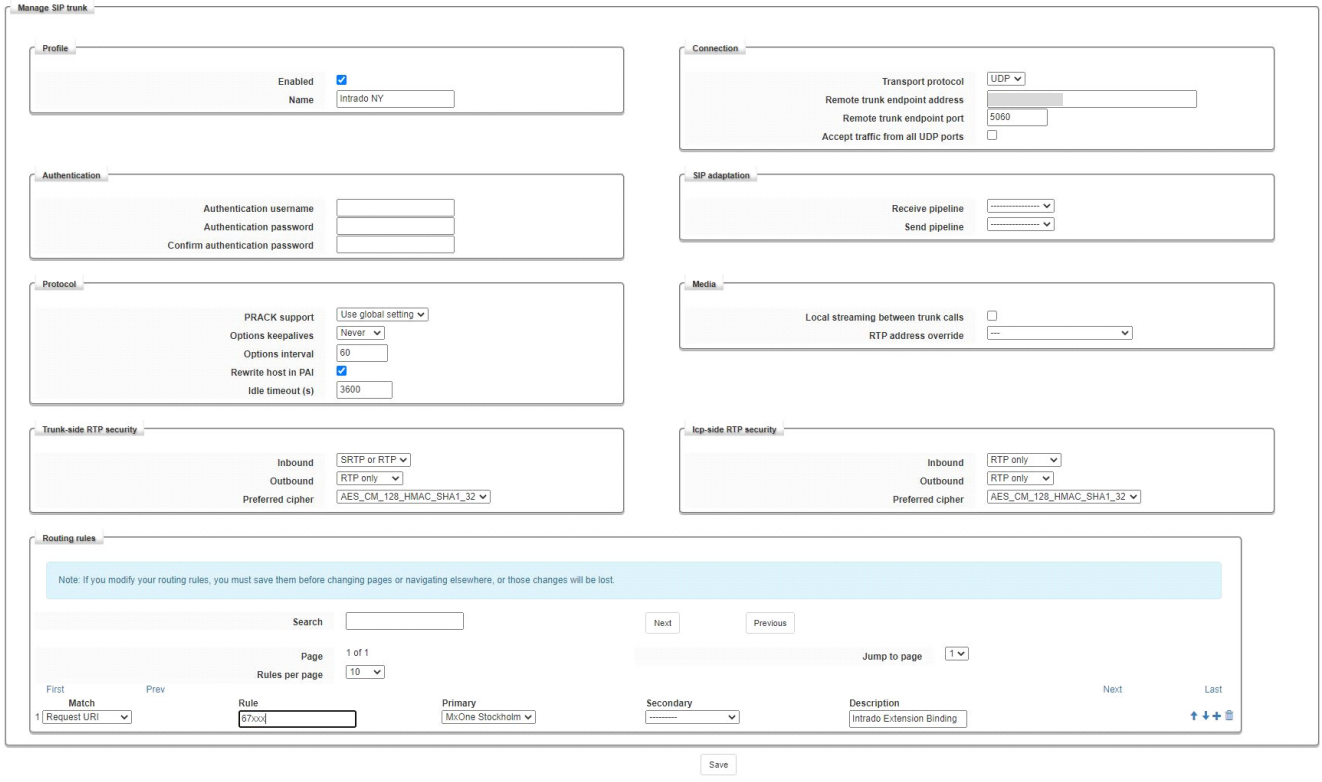
MBG needs to be configured to accept incoming calls for the Intrado´s Extension Bind – callback number to work. In MBG, routing rules for extension numbers needs to be configured. It’s also recommended to configure appropriate IP blocking rules in MBG when Extension Bind is used.

Figure 6.2: Extension bind – Callback Number Support



The rule needs to be associated to the SIP trunk to Intrado.

Figure 6.3: Manage SIP Trunk



Intrado Configuration Guidelines

To be able to use the Intrado Emergency Routing Service (ERS) portal, you must contact the Intrado team and get your credentials.

The examples in these guidelines assume that an administrator account is used for the setup.

For more information about the Intrado ERS portal, read the appropriate Intrado document (The Emergency Routing Service User Guide), available under Help (? Icon) in the Dashboard.

NOTE: Emergency Routing Service ® and 911 Location Manager ® are registered trademarks of Intrado Life & Safety, Inc.

Figure 7.1: Account Dashboard

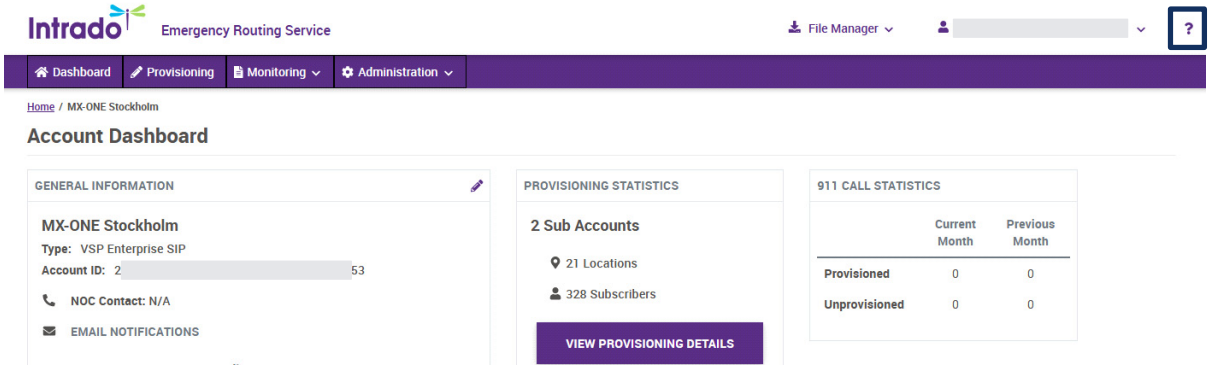
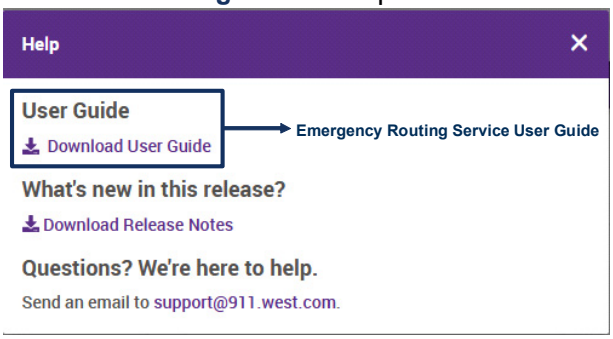


Figure 7.2: Help - User Guide



Obtaining the Customer ID

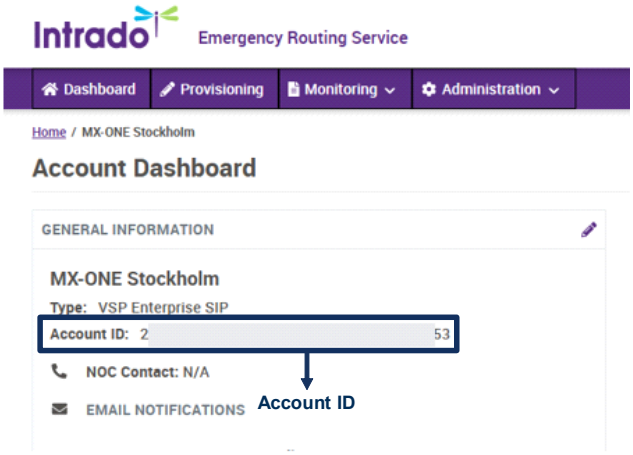
To obtain the Customer ID to be setup in MX-ONE, do the following:

1. In the Intrado ERS portal dashboard, go to **Account Dashboard**.
2. Take note of the Account ID details, which must be added in the customer ID in MX-ONE emergency location database.

NOTE: Intrado requires a customer identifier for each emergency call which are part of sub-accounts (level 3 account) (Tenants/Customer group in MX-ONE). The customer identifier is provided by Intrado and it is called as Account ID in the Intrado portal. It can be found in the Intrado portal dashboard under General Information.

NOTE: For standard accounts (layer 2 accounts) Intrado identifies the calls using Public IP addresses or FQDNs for the customer public SIP Trunk Endpoint. In this case the customer ID does not need to be configured in MX-ONE.

Figure 7.3: Account Dashboard - Account ID



Notifications

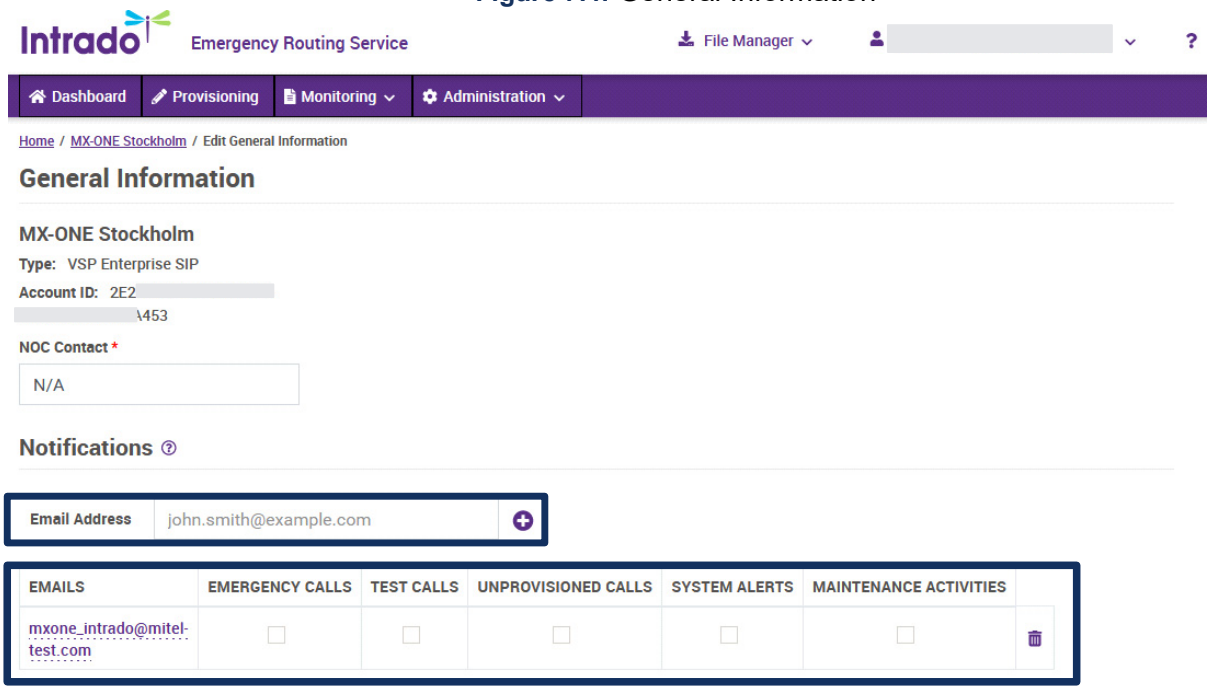
The ERS portal offers notifications options, the options are:

- Emergency calls
- Test calls
- Un-provisioned calls
- System alerts
- Maintenance Activities

To setup notification, go to General Information and click the pencil (provisioning) tab.

Add the email address of the person that needs to be notified and select the options.

Figure 7.4: General Information



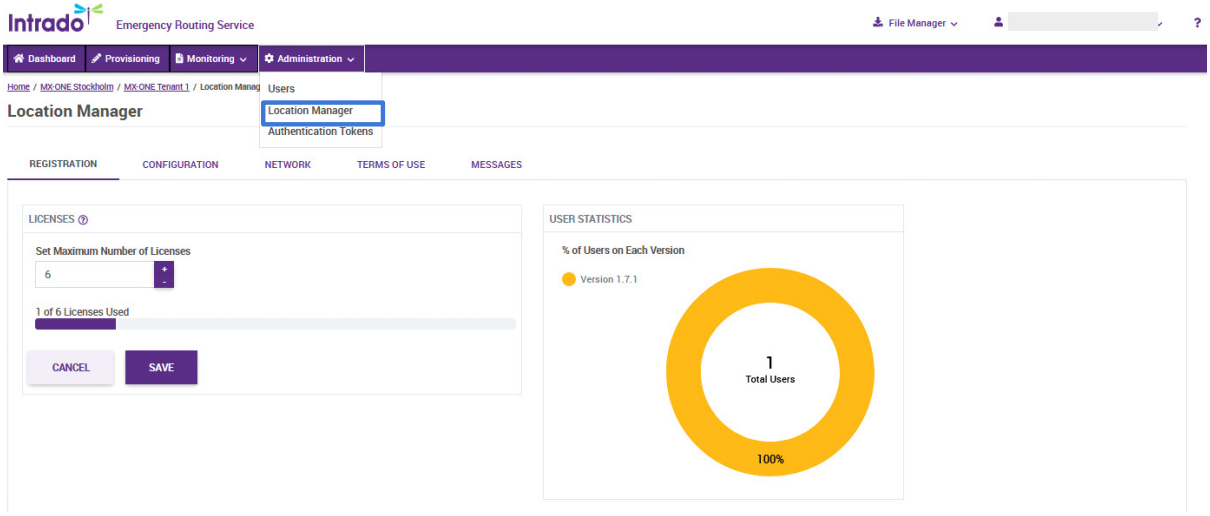
Location Manager Licenses

Before install 911 Location Manager client, please check if licenses are available in the system.

To check if licenses are available in the system, do the following:

1. In the Intrado ERS portal dashboard, go to **Administration** menu and then **Location Manager**. Contact Intrado for information about licenses.

Figure 7.5: Location Manager



Authentication Tokens

Authentication Tokens are used with HELD clients, like MiCollab clients.

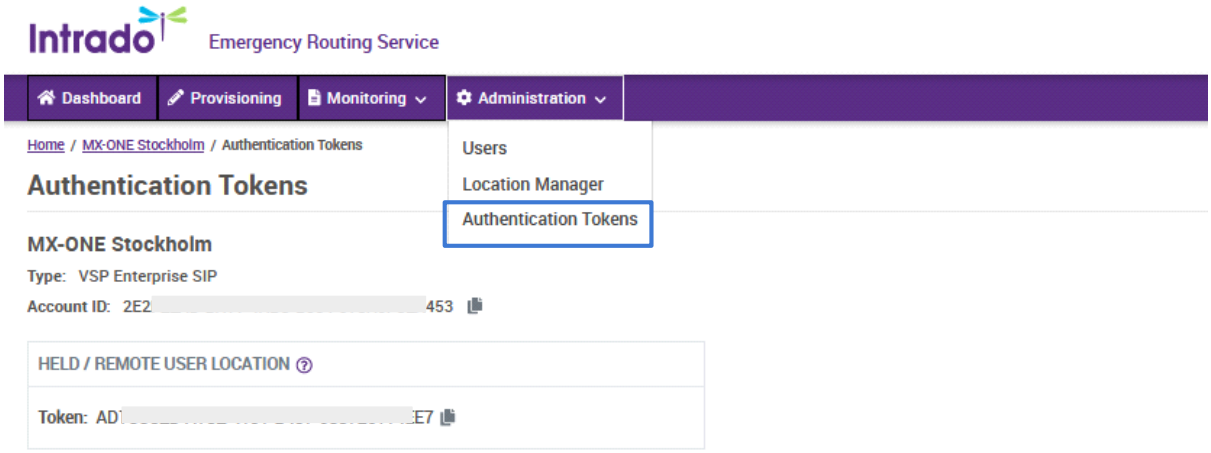
Before configuring MiCollab server check if authentication tokens are available in the system.

To check if authentication tokens are available in the system, do the following:

1. In the **Intrado ERS portal** dashboard, go to **Administration** menu and then **Authentication Tokens**.
2. If available take note of the details, which must be added in the MiCollab Server.

NOTE: Contact Intrado team for more information about Authentication Tokens.

Figure 7.6: Authentication Tokens



To setup authentication tokens in MiCollab Server, check MiCollab documentation.

How to Provision Intrado

Introduction

The Intrado system requires that Emergency Response Location (ERL) are provisioned in the system. According to Intrado: “Emergency Response Location (ERL) is a virtual representation of a physical address that includes civic address information, GPS coordinates, and additional location data that are used to determine the call flow and destination of a 911 call”.

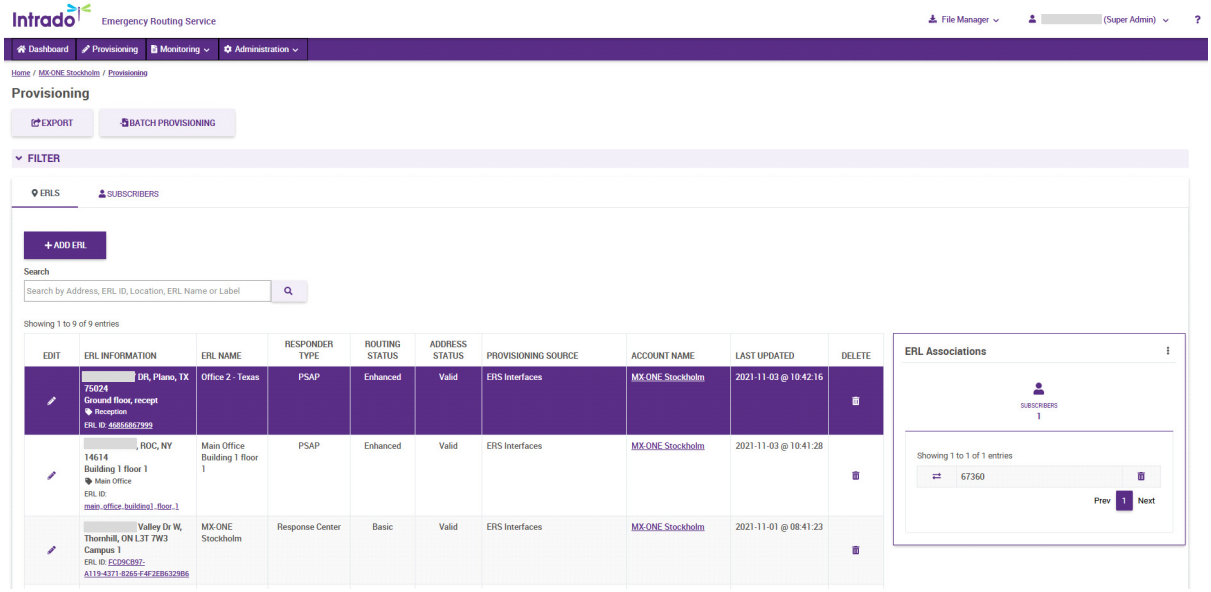
The ERL needs to be provisioned in the Intrado ERS portal.

Provisioning ERL and Subscribers

Access Intrado portal with your credentials and go to the Dashboard.

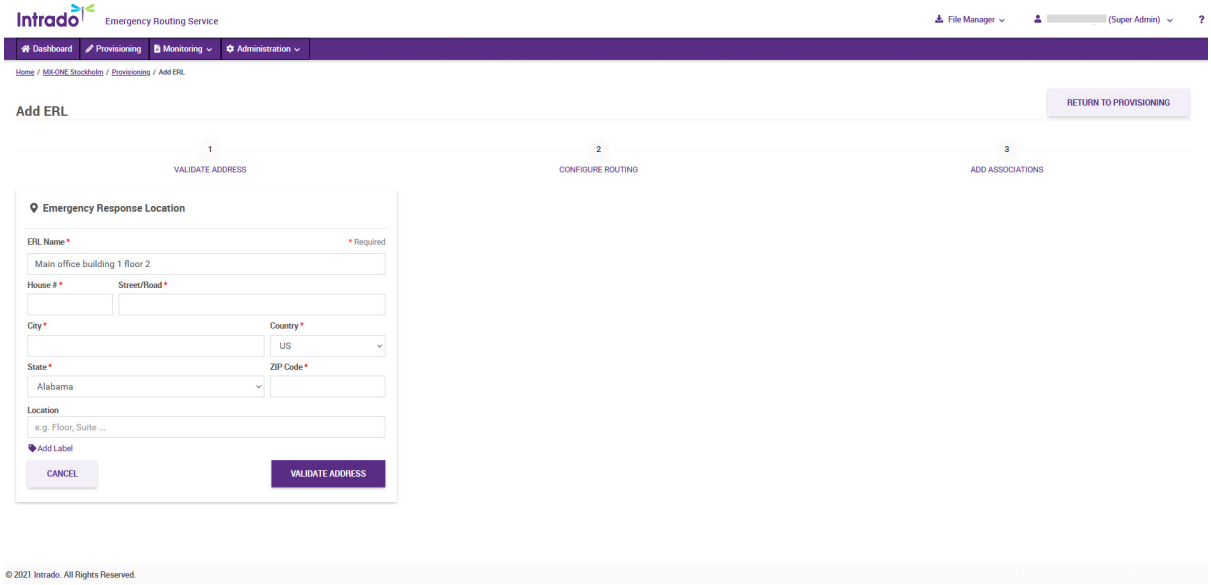
1. Go to **Provisioning** menu, and then **ERLS**.

Figure 7.7: Add ERLs



2. Click **+Add ERL** and add the required civic address information and click **VALIDATE ADDRESS**.

Figure 7.8: Validate Address



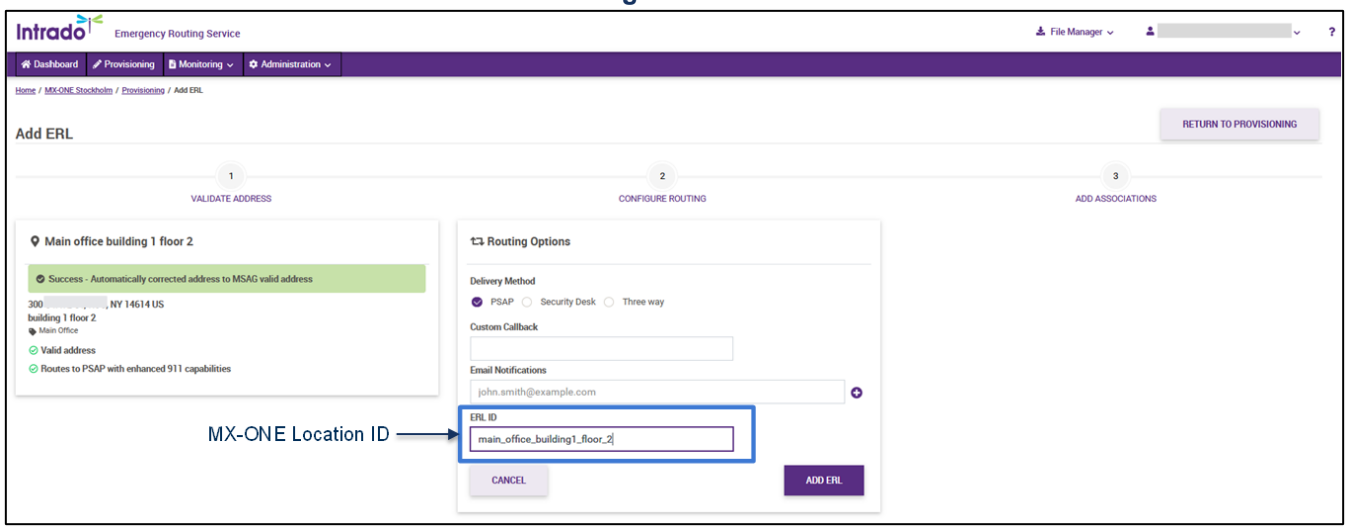
3. Now add the routing options.

NOTE: The ERL ID, which is equivalent to MX-ONE Location ID, can be added manually in the ERL ID field, this is required when MX-ONE Location ID is configured in the MX-ONE.

NOTE: Intrado supports maximum 36 characters in the ERL ID. The supported characters are: Alpha-numeric (0-9, a-z, A-Z) Parenthesis's (), dot ., Underscore _, dash - .

NOTE: If the ERL ID is not manually added, the system will generate one automatically. This can then be used as a Location ID in the MX-ONE system.

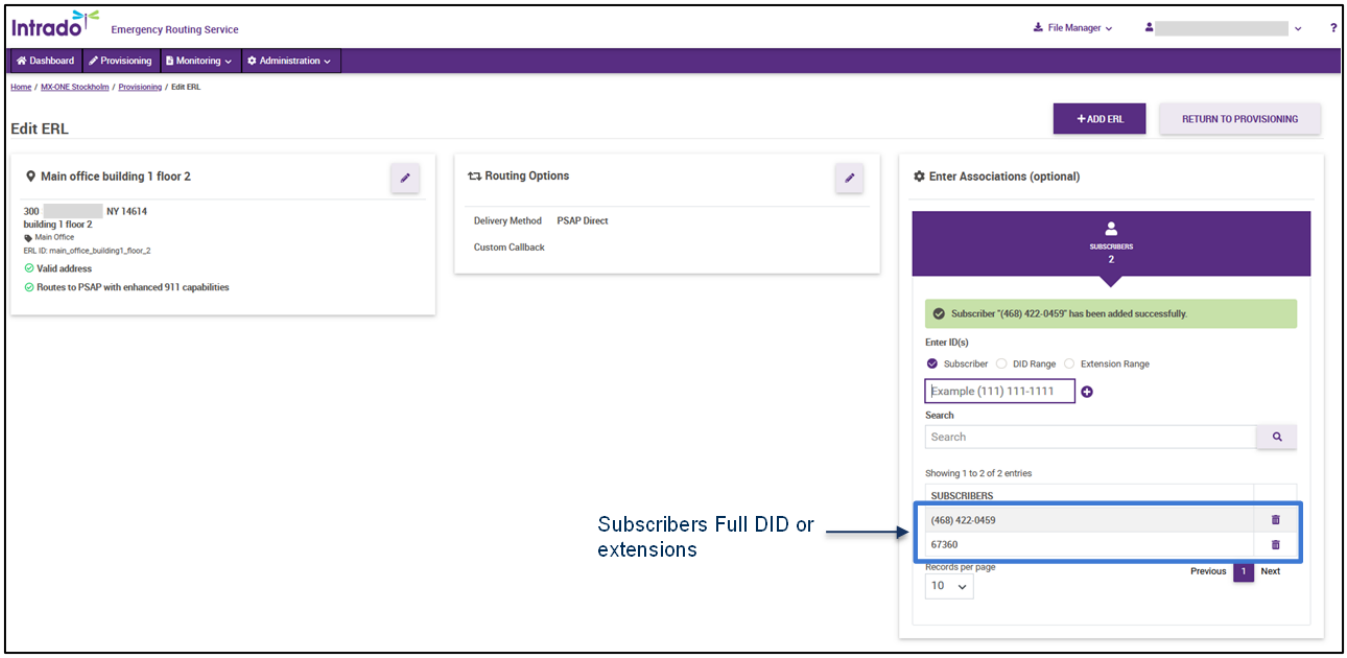
Figure 7.9: Add ERL ID



4. Add a subscriber to this **ERL ID**, if required. The subscriber is a phone number (full 10 dialable digits (DID)) or an extension number. It can be added individually or in ranges.

   NOTE: a subscriber is required to be setup in the system as Intrado uses the subscriber ID information to detect if who is calling can be identified by the system, if it cannot be identified by the system (un-provisioned call), the call is routed to Emergency Call Response Center (ECRC) to identify the caller´s location.

Figure 7.10: Subscribers Full DID



5. Add more locations, if required. To do it, add more ERL IDs in the provisioning task.

911 Location Manager Client

Intrado offers a desktop client called 911 Location Manager that is used by the end-users to set up their own location. It requires licenses and it must be provisioned by the administrator in the Intrado portal.

Using the 911 Location Manager client gives the user a possibility to set the location when working at home, at the office, or any other place.

The 911 Location Manager client requires a valid phone number (DID - 10 digits).

Contact Intrado team for more information about 911 Location Manager client.

The 911 Location Manager client is recommended to be used together:

- Mitel SIP phones 6800 and 6900 SIP series phones when the phones are used in Teleworker mode.
- InAttend Client (always).

NOTE: InAttend Client requires that the RAY BAUM emergency private queue function is enabled or the InAttend Client is able to receive emergency callback calls without the call be queued. Refer to the InAttend documentation for instructions on how to set it up.

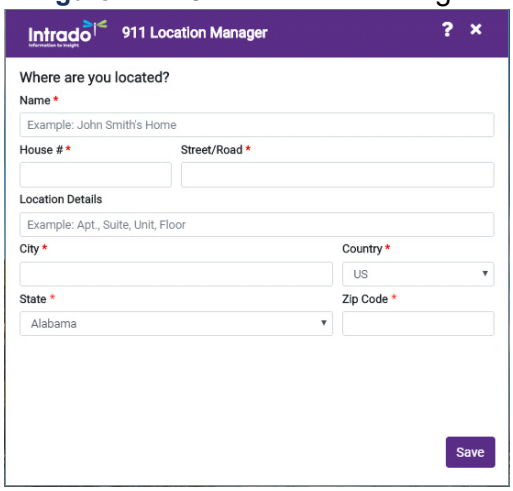
911 Location Manager Client Setup

Install the 911 Location Manager client. After, configure it with the required information and save it.

The figure below shows the 911 Location Manager client setup form.

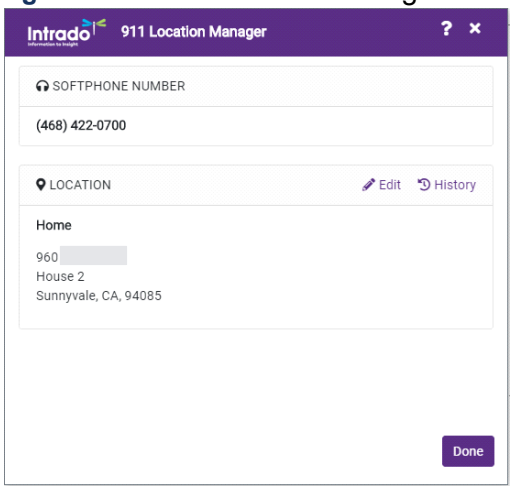
NOTE: The 911 Location Manager client setup is valid for both InAttend client and 6800/6900 SIP series phones in teleworker mode.

Figure 7.11: 911 Location Manager client setup



The figure below shows the 911 Location Manager after setup.

Figure 7.12: 911 Location Manager client after setup



Validate the Solution

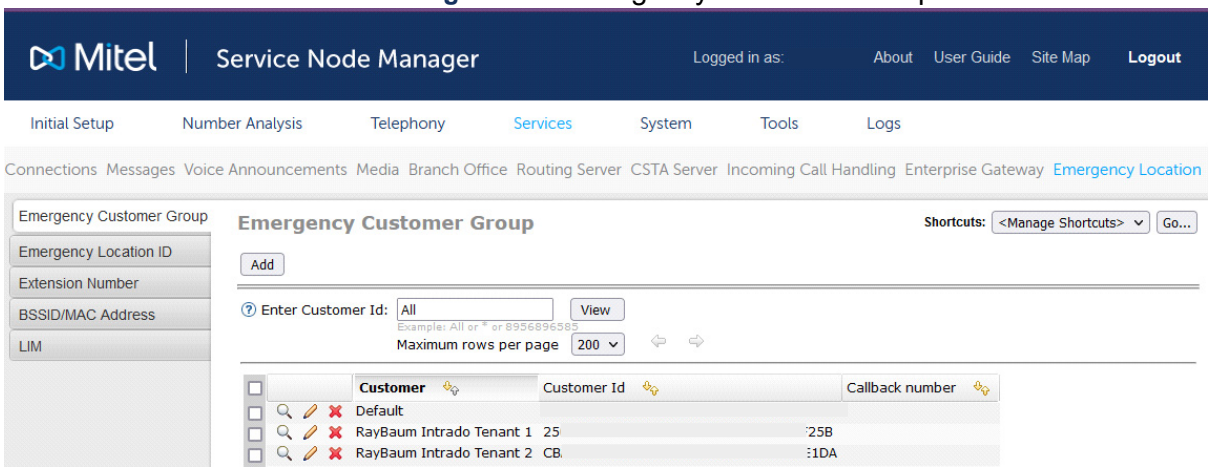
After the setup is completed, make a call using a device connected in MX-ONE to the Intrado test number, 933.

If the setup and the connectivity are correct, the call will be answered by an IVR.

In the example calls, MX-ONE is setup with customer groups and Intrado ERS is setup with sub-accounts.

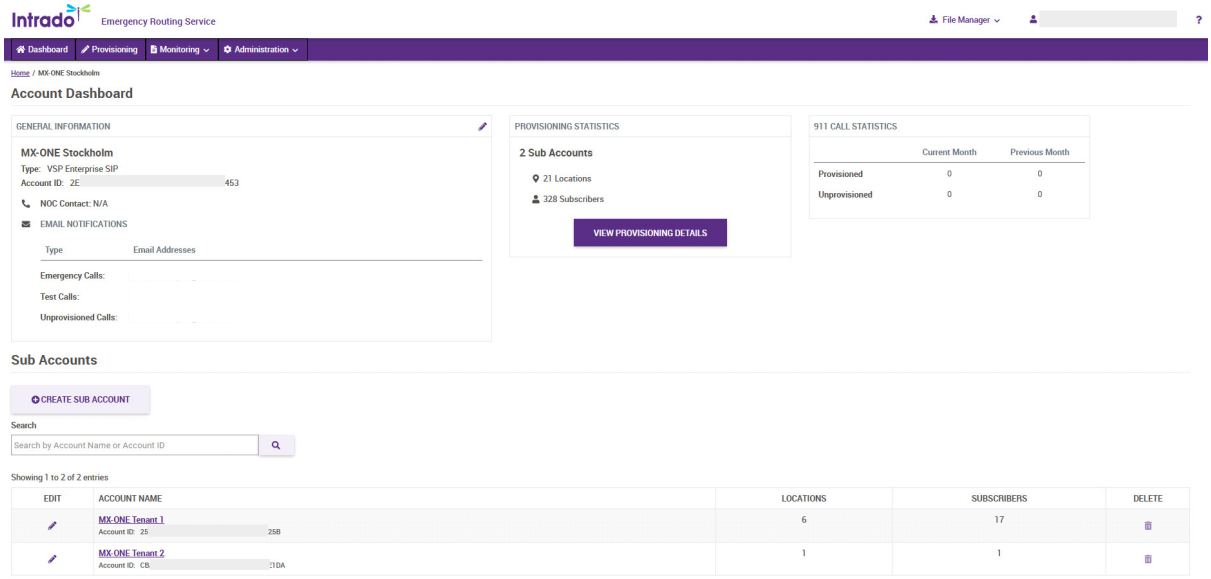
MX-ONE uses customer group 11 (RayBaum Intrado Tenant 1) and 12 (RayBaum Intrado Tenant 2)

Figure 8.1: Emergency Customer Group



In **Intrado ERS** portal, the sub-accounts MX-ONE Tenant 1 and MX-ONE Tenant 2 are configured.

Figure 8.2: Sub-accounts Configuration



Monitoring the Test Calls

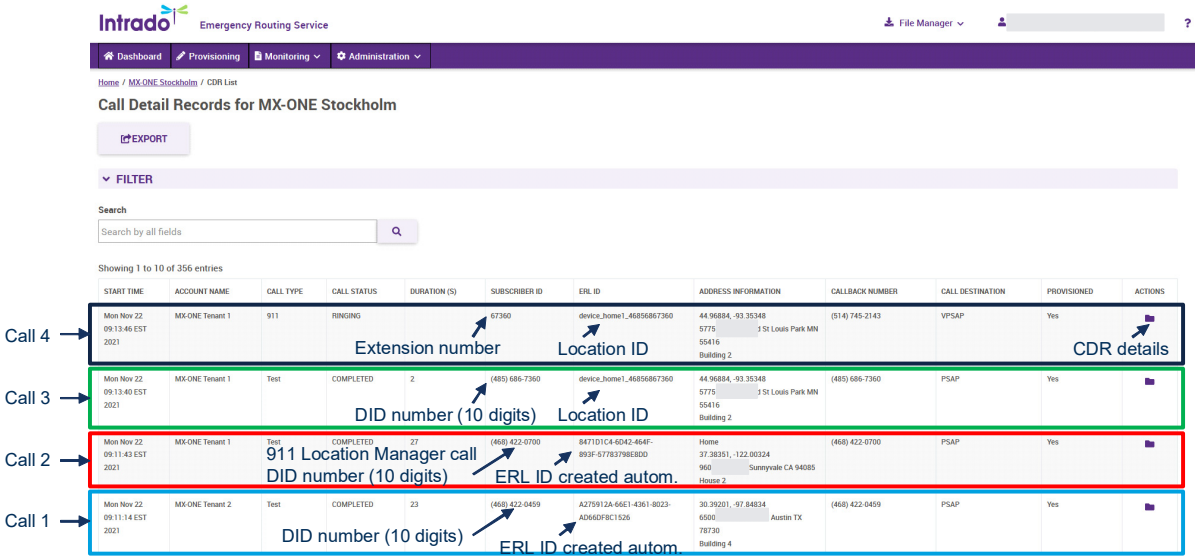
In the Intrado ERS portal, there is a **Call Detail Records** (CDR) task under Monitoring Menu. Verify that the test calls are shown there.

Emergency Location Database Set up or A-number

The following example shows four calls in the Call Detail Record (CDR) task for analysis.

The CDR task offers a detailed option for further analyses, click the **CDR** button from the Actions column.

Figure 8.3: Call Detail Record



Call 1 – Phone number (DID – 10 digits) setup in MX-ONE and Intrado ERS portal

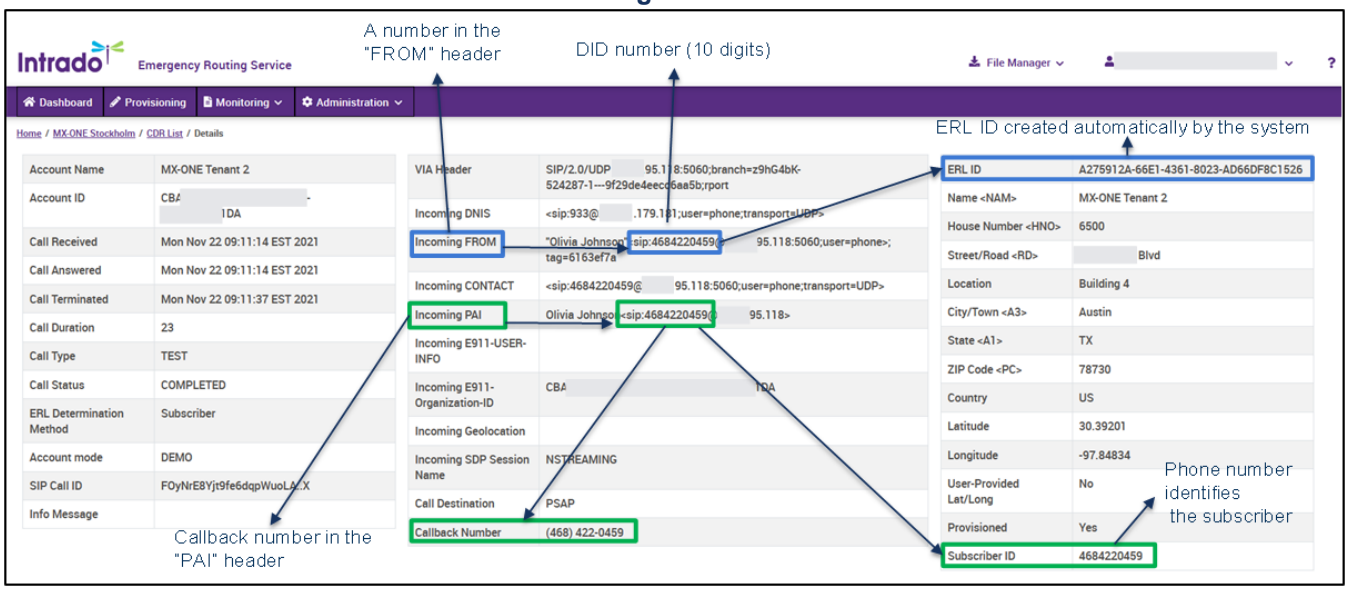
In this example, the call has a valid civic address configured in the Intrado ERS portal using the phone number (4684220459).

Figure 8.4: Call 1

The extension number 20459 is defined in MX-ONE. The number conversion in MX-ONE adds the 46842 to complete the full DID number (10-digit dialable number) when sending the call to Intrado. There is no configuration in MX-ONE in the Emergency Location database for the extension number or directory number 20459.

From the SIP Invite, the “FROM” header is used to identify the location (ERL ID) and the “PAI” header is used to identify the callback number and the subscriber. As this call can be identified by Intrado system, the call is redirected to the PSAP.

Figure 8.5: SIP Invite

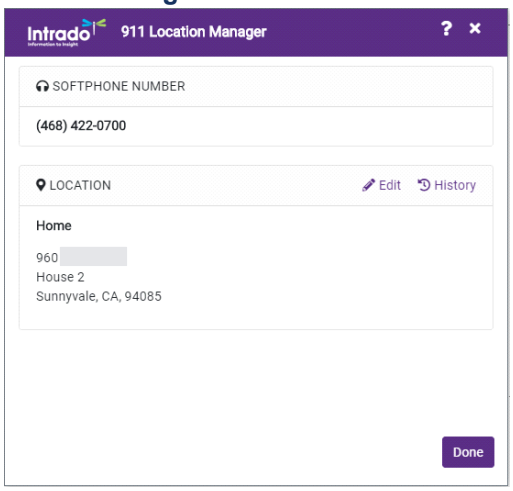


Call 2 – InAttend Client with Phone Number (DID – 10 digits) Setup in MX-ONE and Intrado ERS Portal, 911 Location Manager.

In this example, the InAttend client is using the 911 Location Manager client and the civic address was updated by the client into the Intrado ERS portal.

The number 4684220700 is setup the 911 Location Manager client. In the RAY BAUM emergency private queue function in the InAttend the phone number needs to be added. Refer to the InAttend documentation for instructions on how to set it up.

Figure 8.6: Call Detail Record



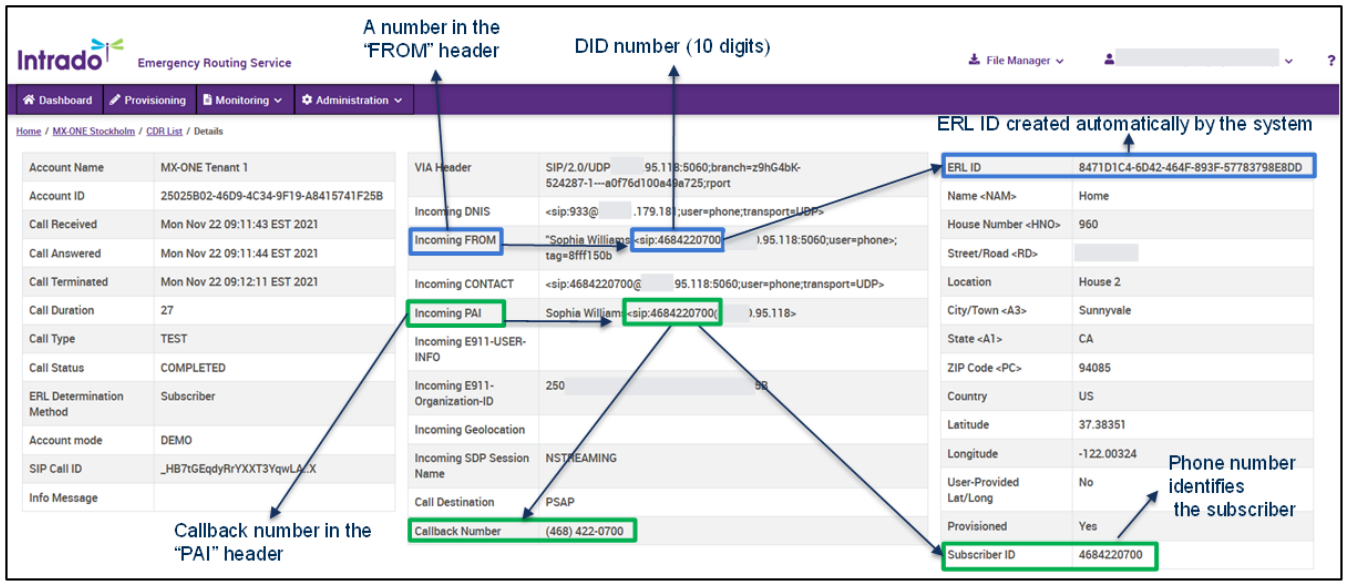
Note: The 911 Location Manager automatically updates and validates the civic address information provided by the user in the Intrado ERS portal.

Figure 8.7: Call 2

The number 20700 is the emergency private queue number sent by InAttend to MX-ONE. The number conversion in MX-ONE appends 46842 to complete the phone number (full DID number) when sending the call to Intrado. There is no configuration in MX-ONE in the Emergency Location database for the extension number or directory number 20700.

From the SIP Invite, the “FROM” header is used to identify the location (ERL ID) and the “PAI” header is used to identify the callback number and the subscriber. As this call can be identified by Intrado system, the call is redirected to the PSAP.

Figure 8.8: SIP Invite



Call 3 – Phone Number (DID – 10-digits) - Emergency Location Database Set up - MAC Address in MX-ONE and ERL ID Manually Added in the Intrado ERS Portal

In this example, the call has a valid civic address configured in the Intrado ERS portal, set up using ERL ID manually added by administrator. The ERL ID is “device_home1_46856867360”.

Figure 8.9: ERL ID

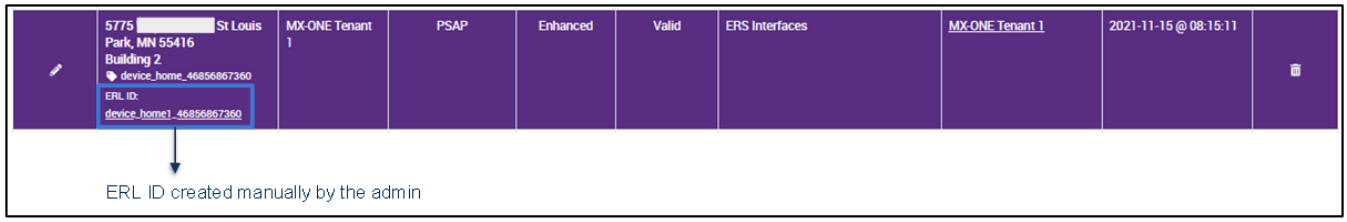


Figure 8.10: Call 3

The extension number 67360 is defined in MX-ONE. The number conversion in MX-ONE adds the 48568 to complete the full DID number (10-digit dialable number) when sending the call to Intrado.

In the MX-ONE, the Location ID “device_home1_46856867360” is defined in the Emergency Location database and it is associated with the SIP Phone MAC address.

Figure 8.11: Emergency Location ID

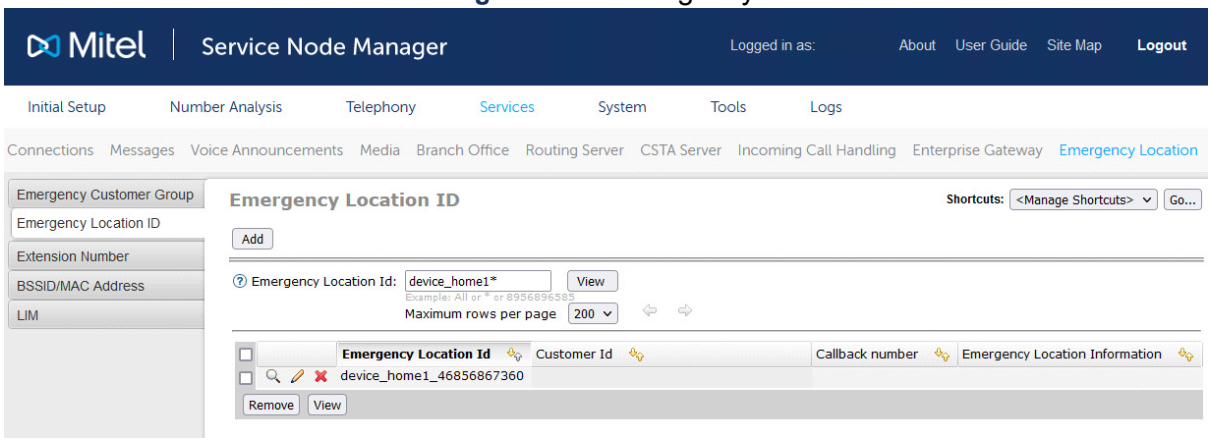
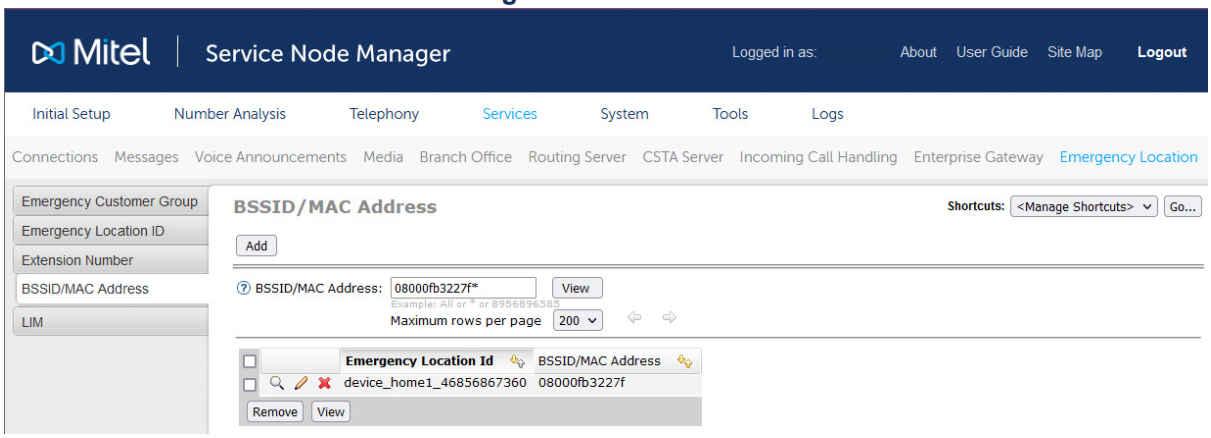


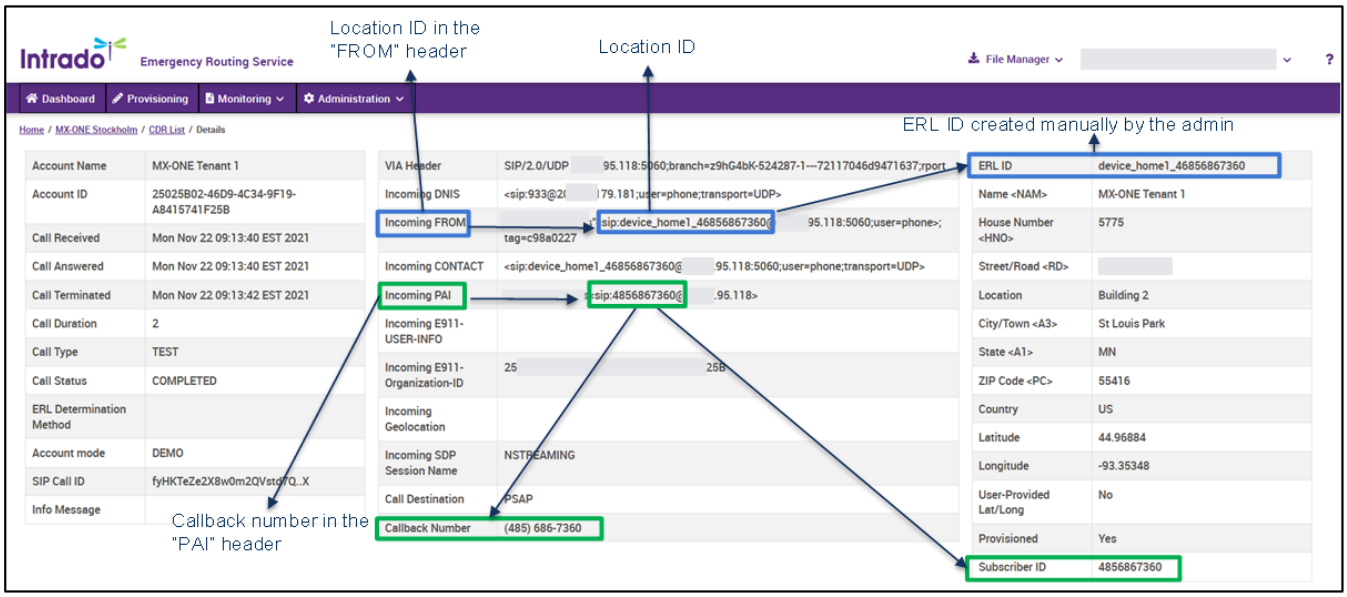
Figure 8.12: BSSID/AC Address



From the SIP Invite, the “FROM” header is used to identify the location (ERL ID) and the “PAI” header is used to identify the callback number and the subscriber. As this call can be identified by Intrado system, the call is redirected to the PSAP.

Note that in this case the ERL ID is the MX-ONE Location ID “device_home1_46856867360”.

Figure 8.13: SIP Invite



Call 4 – Extension Number - Emergency Location Database Set up - MAC Address in MX-ONE and ERL ID manually added in the Intrado ERS portal - Extension Bind.

In this example, the call has a valid civic address configured in the Intrado ERS portal, set up using ERL ID manually added by administrator. The ERL ID is “device_home1_46856867360”.

Figure 8.14: ERL ID

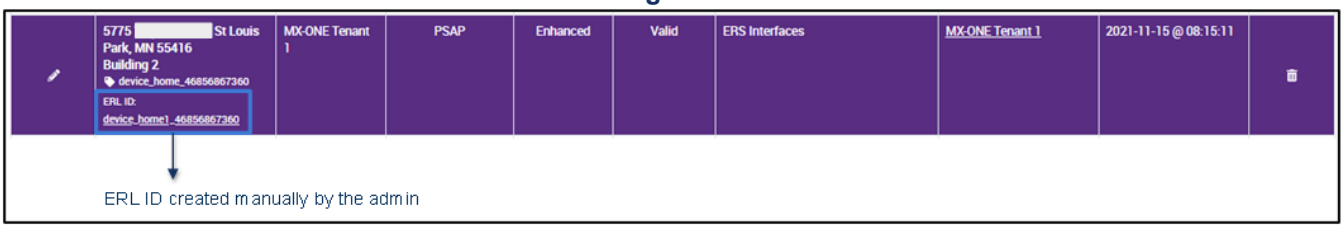


Figure 8.15: Call 4

The extension number 67360 is defined in MX-ONE. There is no number conversion in MX-ONE, so the extension number is sent to Intrado.

In the MX-ONE, the Location ID “device_home1_46856867360” is defined in the Emergency Location database and it is associated with the SIP Phone MAC address.

Figure 8.16: Emergency Location ID

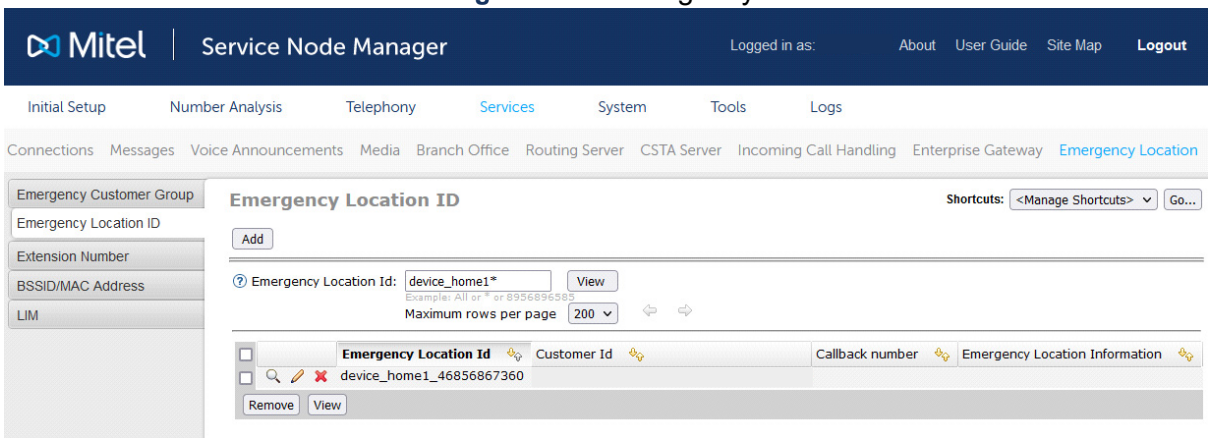
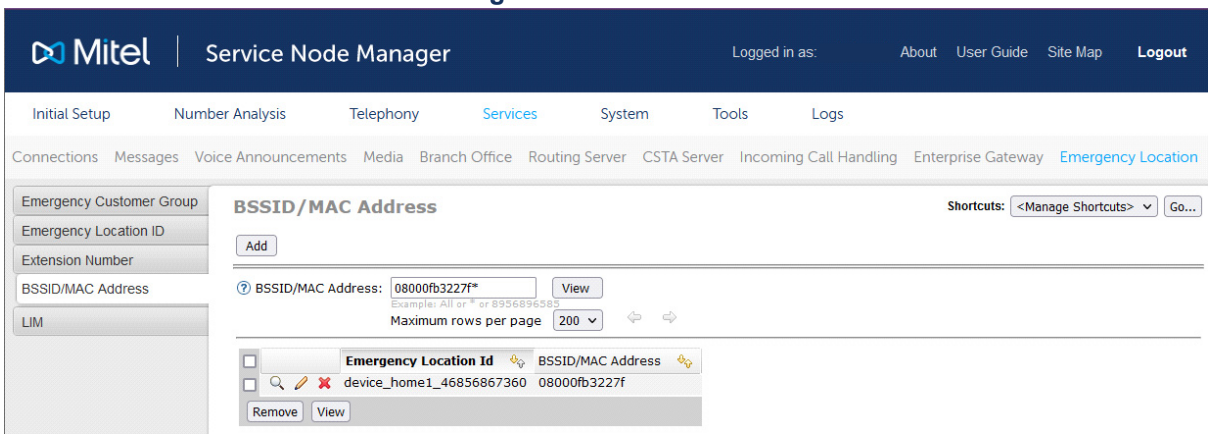


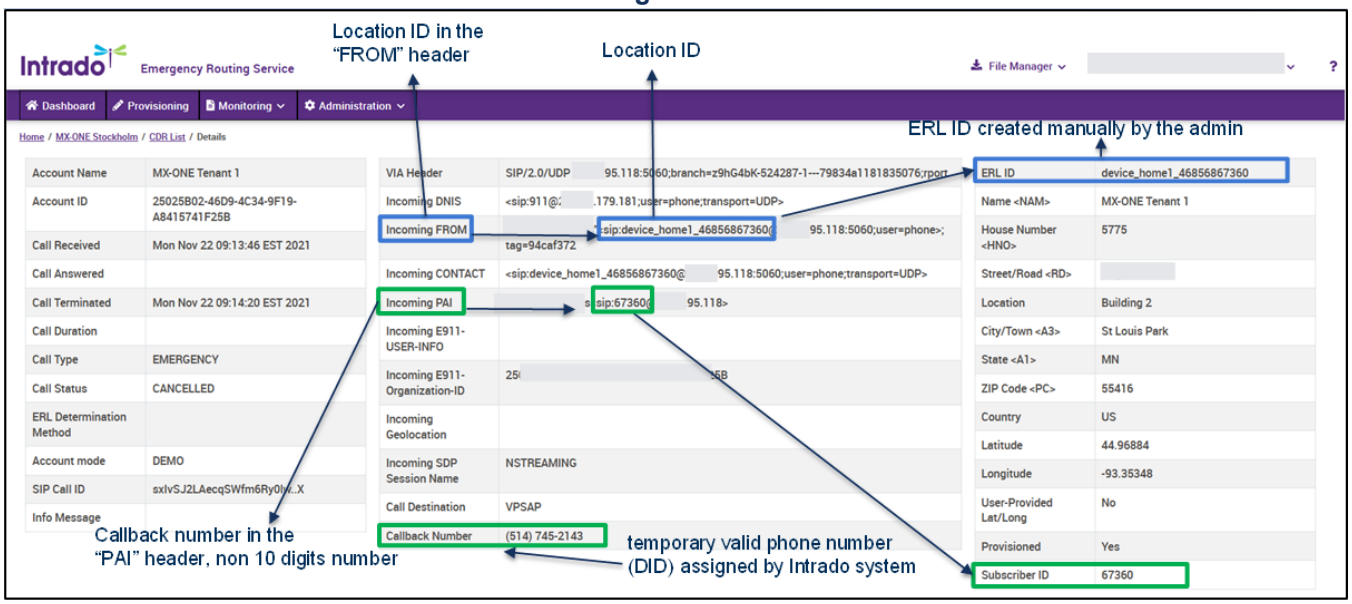
Figure 8.17: BSSID/MAC Address



From the SIP Invite, the “FROM” header is used to identify the location (ERL ID) and the “PAI” header is used to identify the callback number and the subscriber. The difference from this call and the call 3 is that the extension bind functionality is used for non-10 digits numbers. As the “PAI” header contains the extension number, Intrado assigns a temporary valid DID number from it´s own DID range. In case the call gets disconnected, the Emergency Response team will be able to reach the person dialing back the number supplied by Intrado and the call will be forwarded to the extension number in the MXONE system via the SIP trunk between MX-ONE/MBG and Intrado.

As this call can be identified by Intrado system, the call is redirected to the PSAP.

Figure 8.18: SIP Invite



Note that in this case the ERL ID is the MX-ONE Location ID "device_home1_46856867360" and the call-back number is a valid phone number (DID) assigned by Intrado system.

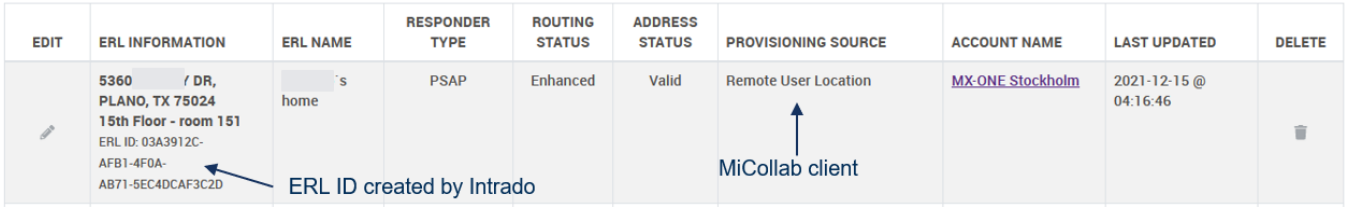
Geolocation (HELD) - MiCollab Desktop Client Call

The MiCollab client phone number (full DID number) or extension number needs to be added as a subscriber in Intrado ERS portal.

In the MX-ONE emergency location database, there is no specific configuration for the MiCollab Client. Only the Customer ID might be defined in the emergency database.

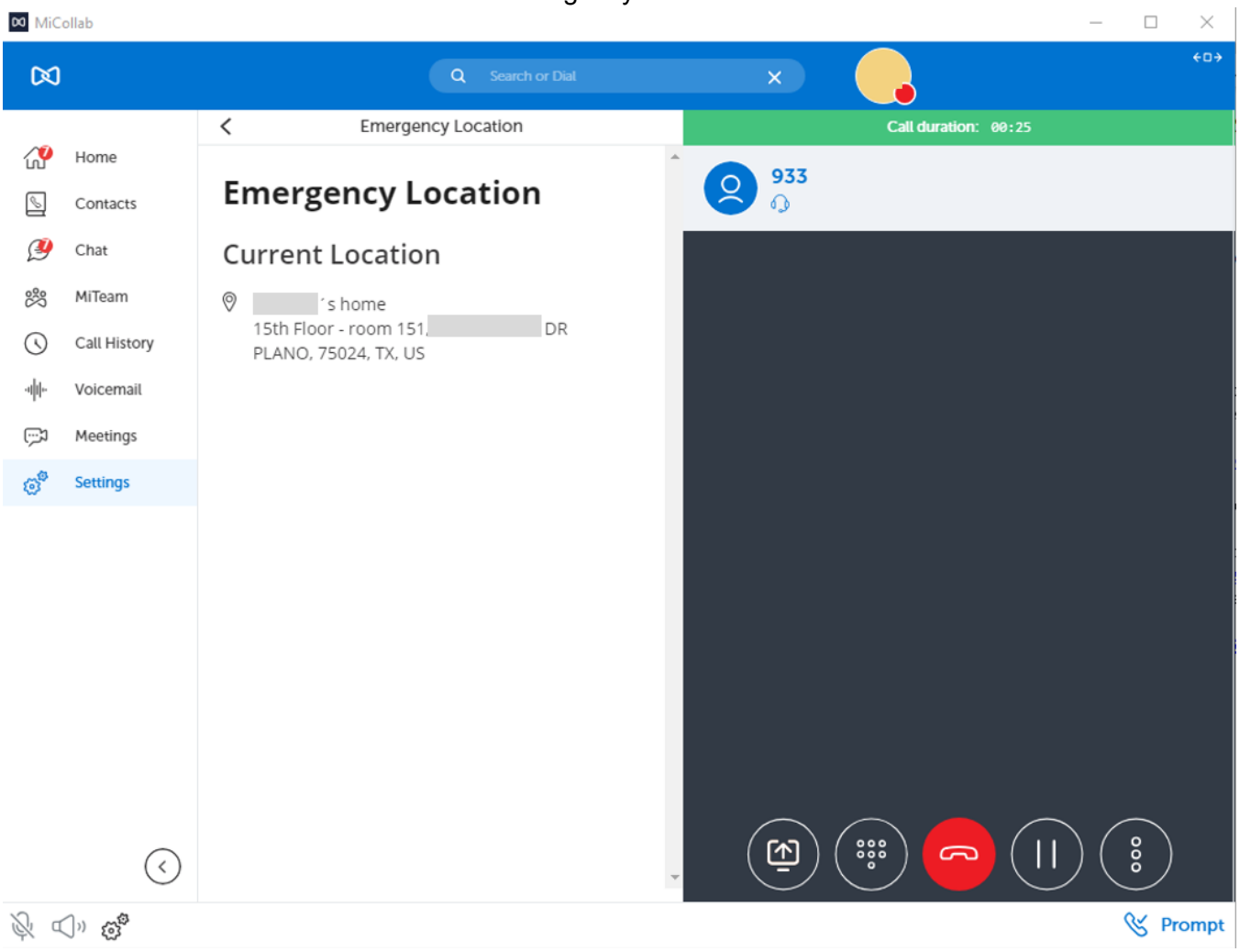
When the user updates the location in the MiCollab client, it sends the location information to Intrado via HELD protocol and then the location is updated in the ERS portal.

An ERL ID is generated for that location, please see the following figure.



MiCollab client provides the ERL ID in the Geolocation header to MX-ONE during the emergency call and MX-ONE sends it to Intrado via SIP trunk.

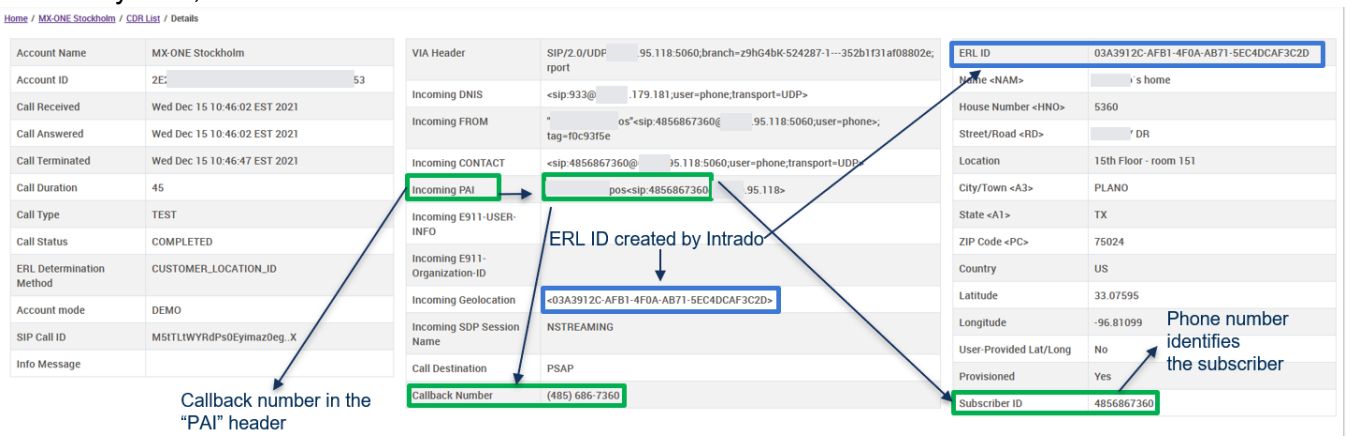
The following figure shows the MiCollab Client configured with the Emergency Location. The user has defined the current address and made an emergency test call.



The following example shows a MiCollab client call using HELD protocol in the Call History for analysis.

The number 67360 is the extension number defined in MX-ONE. The number conversion in MX-ONE appends 48568 to complete the phone number (full DID number) when sending the call to Intrado. There is no configuration in MX-ONE in the Emergency Location database for the extension number or directory number 67360.

From the SIP Invite, the “Geolocation” header is used to identify the location (ERL ID) and the “PAI” header is used to identify the callback number and the subscriber. As this call can be identified by the Intrado system, the call is redirected to the PSAP.



Acronyms, Abbreviations, and Glossary

BSSID: Basic Service Set Identification. MAC address of a Wireless access point (WAP).

CESID: Caller Emergency Service Identification, equivalent to ELIN.

Customer ID: An identifier used by the NG911 service provider to unique identify a customer.

ELIN: Emergency Location Identification Number also known as CESID.

ERS: Emergency Routing Services.

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.

HELD: HELD protocol (HTTP-Enabled Location Delivery), refer to RFCs 5985 and 7840.

Integrated DECT: The TDM DECT solution used by MX-ONE, this requires an ELU-31 board. It is also called Traditional DECT, legacy DECT or TDM DECT.

LIS: Location Information Server.

LLDP-MED: Link Layer Discovery Protocol-Media Endpoint Discovery.

MBG: Mitel Border Gateway.

MLTS: Multi Line Telephone System. Equivalent to a PBX, but is the nomenclature used in the RAY BAUM'S Act.

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

NG911: Next Generation 911.

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. PoP: Point of Presence.

PSAP: Public Safety Answering Points.

SBC: Session Border Controller.

SBN: Survivable Branch Node.