

MCP 3.0 Standard (04.02)
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Provisioning Enhanced 911 Services

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Welcome

This document describes how to provision the Multimedia Communication Server (MCS) system for Enhanced 911 (E911) service in North America. This requires domain provisioning for location hierarchy, and Emergency Response Locations (ERLs), and also requires system provisioning for emergency numbers and gateway routes.

Locations can be associated with any and all of the following through provisioning

- subscriber
- domain or subdomain
- gateway
- pooled resource



Note: E911 planners should be familiar with local and national E911 requirements and regulations before implementing E911 services for the MCS system.

Overview

Topics include:

- [Chapter 1, “Introduction to Enhanced 911 services,” on page 1](#)
- [Chapter 2, “Understanding Emergency Response Locations,” on page 5](#)
- [Chapter 3, “Setting up the MCS system for E911,” on page 17](#)
- [Chapter 4, “Provisioning E911 locations,” on page 27](#)
- [Chapter 5, “Emergency Application service,” on page 47](#)
- [Chapter 6, “Updating the PSAP database,” on page 51](#)
- [Chapter 7, “Troubleshooting,” on page 55](#)

Audience

This document is intended for service providers and administrators (with varying levels of privileges) assigned to provision E911 services for users in their system.

What is not covered

This document does not cover:

- MCS system installation and configuration
- System Management Console
- Provisioning Client graphical user interface (GUI) tasks and procedures (other than the provisioning of E911 services)

Text and graphic conventions

This guide uses the following text and graphic conventions:

bold text	Indicates a menu option, link, or command key you need to click. Example: Click Ok .
<i>italic text</i>	Indicates • a domain name or subdomain name • a document title • a variable name
separator (>)	Shows menu paths. Example: Gateway > Add Gateway
	Indicates a top level menu item in the Provisioning Client menu hierarchy.
	Indicates a sub menu item in the Provisioning Client menu hierarchy.
	Indicates a form in the Provisioning Client menu hierarchy.

Acronyms

This document uses the following acronyms

ALI	Automatic Location Information
ANI	Automatic Number Identification
CRTC	Canadian Radio-television and Telecommunications Commission
DID	Direct Inward Dial
DN	Directory Number
EA	Emergency Application
ERL	Emergency Response Location
IM	Instant Message
MAS	Media Application Server
MCS	Multimedia Communication Server
MSAG	Master Street Address Guide
NENA	National Emergency Number Association
OSN	On Site Notification
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
SIP	Session Initiation Protocol

Related publications

The following table lists related Nortel Technical Publications (NTPs) and part numbers.

NTP	Part number
Bulk Provisioning Tool Reference Guide	NN10308-316
MCS 5100/5200 End User Feature Description Guide	NN10403-113 or NN10404-113
MCS 5100/5200 System Management Console User Guide	NN10273-111 or NN10247-111
Media Application Server - Meet Me Audio Conferencing Quick Reference	NN10283-001

NTP	Part number
Multimedia PC Client User Guide	NN10041-113
Multimedia PC Client Quick Reference	NN10311-001
Multimedia Web Client User Guide	NN10040-113
Multimedia Web Client Quick Reference	NN10306-001
Open Provisioning Interface OUFCAPS	NN10309-316
Personal Agent User Guide	NN10039-113
Personal Agent Quick Reference	NN10290-001
Provisioning Client User Guide	NN10043-113
RTP Media Portal Basics	NN10265-111
i2002 Internet Telephone User Guide	NN10319-113
i2002 Internet Telephone Quick Reference	NN10301-001
i2004 Internet Telephone User Guide	NN10042-113
i2004 Internet Telephone Quick Reference	NN10307-001

How to get help

For service issues, please contact your local support or Information Services team.

Chapter 1

Introduction to Enhanced 911 services

Topics in this section

- [“Overview” on page 1](#)
- [“Differences between basic 911 and E911” on page 2](#)
- [“E911 terminology” on page 2](#)

Overview

The introduction of E911 services into the MCS system is accomplished through integration with existing public and external E911 subsystems. Integration with existing public and external E911 subsystems involves the following steps:

- 1** use of existing MCS system procedures to have user location information maintained in an automatic location information (ALI) database
- 2** delivery of caller information to the Public Safety Answering Point (PSAP) terminal which in turn will use that caller information as a basis for a query into the ALI database.

To accomplish this integration, concepts and processes inside of the MCS system are implemented to describe the geography of the system and to use this knowledge in the processing of emergency calls.

Differences between basic 911 and E911

For basic 911 emergency service in North America, when a caller dials 911 the call is routed to a public safety answering point (PSAP) - also called the 911 operator. These calls are then routed to some PSAP; not necessarily a local one. The PSAP or 911 operator is responsible for talking to the caller and arranging the appropriate emergency response, such as sending police, fire, or ambulance teams.

Enhanced 911 (E911) extends basic 911 emergency service in the following ways:

- emergency calls are routed to a local PSAP based on the calling phone's Emergency Response Location (ERL).



Note: The terms ERL and location are used interchangeably throughout this document. An ERL is a location used for the purpose of emergency services.

- the caller's location information is displayed at the emergency operator's terminal.
- call routing datafill on the host telephone switch ensures that the call routes to a local PSAP.
- the caller's location information is obtained by the PSAP terminal through use of the calling party's address as the basis for a query to an automatic location information (ALI) database.
- the PSAP also has access to a callback number (referred to as the Automatic Number Identification, or ANI), that the PSAP can use to call back the emergency caller. The PSAP can use this callback number if they need additional information after normally ending the emergency call or to re-establish the emergency call if the call is unexpectedly terminated.

E911 terminology

The following table lists the important E911 terms that you should become familiar with.

Term	Definition
Automatic Location Information (ALI)	A database that provides all of the geographic (location) information to PSAPs for E911 calls. Updates to this database are made as soon as possible for new entries, while updates to existing records are typically done once every 24 hours. ALI database entries should be approved by the Master Street Address Guide (MSAG).
Automatic Number Identification (ANI)	This is the phone number of the party calling 911. A minimum of one ANI must be assigned to each ERL. Note that each ANI added will count against the system defined maximum user count value for a domain.
Canadian Radio-television and Telecommunications Commission (CRTC)	The CRTC is an independent agency responsible for regulating Canada's broadcasting and telecommunications systems.
Direct Inward Dial (DID)	Associated with each ERL is one or more 10 digit DID numbers. The DIDs are used for the sole purpose of identifying the ERL and as a key for the PSAP into the ALI database to access the ERL information. Typically used in the enterprise context, this number is used to contact the enterprise subscriber from anywhere on the PSTN.
Emergency Response Location (ERL)	Defines the geographic locations that are associated with local PSAPs. Represents a physical address, a building floor (for multi-story buildings), floor partition (for floors greater than 40,000 square feet, and room number (optional). Used interchangeably with location. An ERL is a location used for the purpose of emergency services and may be defined differently from state to state. This term is specific to the United States.
Location	Defines a geographic location. An ERL may map to a defined geographic location. There may be locations where an ERL does not map. For example, an ERL could be defined as a floor of a building, but a location could be a conference room of that floor or all cubes of the floor.
Master Street Address Guide (MSAG)	All street data, including street names, address ranges and ERLs used to validate incoming telephone number data for provisioning of selective routing.
National Emergency Number Association (NENA)	The association that recommends standards for 911, including specifying the format for ALI database records (http://www.nena.org).

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Term	Definition
On site notification (OSN)	For enterprise customers, on-site notification (OSN) must be provided if personnel are present, although this requirement varies from state to state. OSN functionality indicates to a security guard, administrator or other "front-door" personnel that someone within the building has made an emergency call. This allows this person to direct police, ambulance or other emergency workers to the proper location within the building for faster response. The OSN instant message address must be monitored 24 hours per day, 7 days per week for OSN to be effective in speeding emergency response times.
Public Safety Answering Point (PSAP)	This is the answering location, or operator, for 911 calls. Each PSAP has access to an ALI database, which contains information on physical address and callback numbers.
Public Charge ID	A field in the Provisioning Client GUI that contains the diallable directory number (DN) used by an E911 operator as the call back number in the case where the operator needs to re-establish the call (residential E911 support only).
Subscriber	Person or end user making a 911 call.

Chapter 2

Understanding Emergency Response Locations

Topics in this section

- [“Defining ERLs in the location infrastructure” on page 5](#)
- [“Location to ERL mapping” on page 7](#)
- [“Locations and E911 calls” on page 7](#)
- [“Understanding emergency call priority” on page 9](#)
- [“Working with Emergency Response Locations” on page 9](#)
- [“Selecting a location” on page 12](#)
- [“The importance of choosing the right location” on page 16](#)

Defining ERLs in the location infrastructure

The MCS location infrastructure allow the provisioning of location trees for a domain. Initially, a system administrator defines a group of locations. Some of these locations may be defined as an ERL, while others will remain as a location.

When a 911 call is initiated, the MCS system will verify whether or not the user’s location is defined as an ERL. If not, the system attempts to find the closest location that was defined as an ERL and will use that information to route the call.

Locations associated with local PSAPs are referred to as Emergency Response Locations (ERLs). An ERL represents:

- a physical address
- a building floor (for multi-story buildings)
- a floor partition (for floors greater than 40,000 square feet)
- a room number (optional)

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ERLs contain the following information relevant to the processing of E911 calls:

- a gateway route to the nearest PSAP (Public Safety Access Point)
- one or more ANIs (Automatic Number Identification, for example, the call back number)
- OSN (On Site Notification) related information
- a Master Street Address Guide (MSAG) address
- a description of the ERL

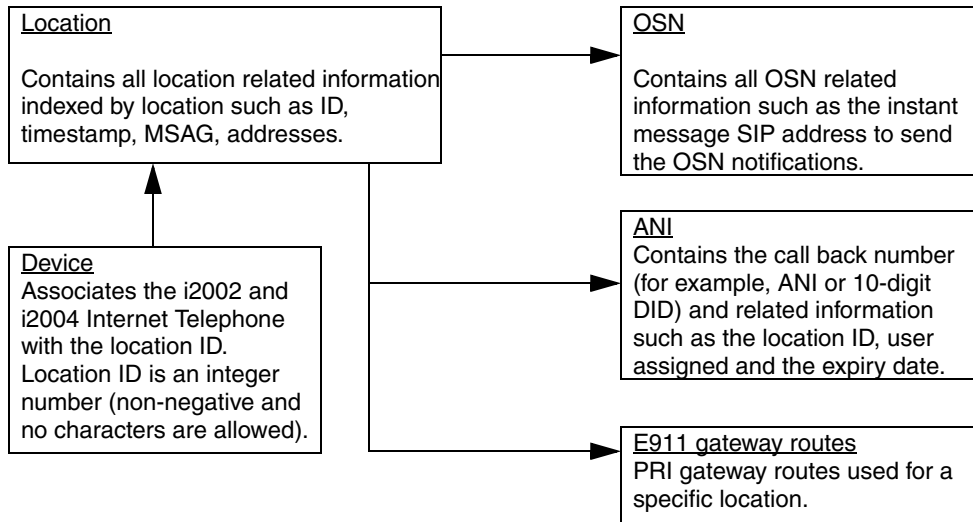


Note: The terms ERL and location are used interchangeably throughout this document. An ERL is a location used for the purpose of emergency services.

Once the location infrastructure has been defined, relevant information (for example, ERL information) must be delivered through existing channels (postal mail or hand delivery) to the Automatic Location Identification (ALI) database. Since the ALI database provides all of the geographic information to PSAPs for E911 calls, it is vital that the ALI database maintain synchronization with the service information. For more information, [see Chapter 6, “Updating the PSAP database,” on page 51.](#)

Location to ERL mapping

The following figure outlines the basic information required for emergency services and location in general.



Note that for the i2002 and i2004 Internet Telephones, the user-selected location is stored in the database module against the device. This is different from the Multimedia PC Client and Multimedia Web Client, where the selected location is stored on the machine the soft client is running.

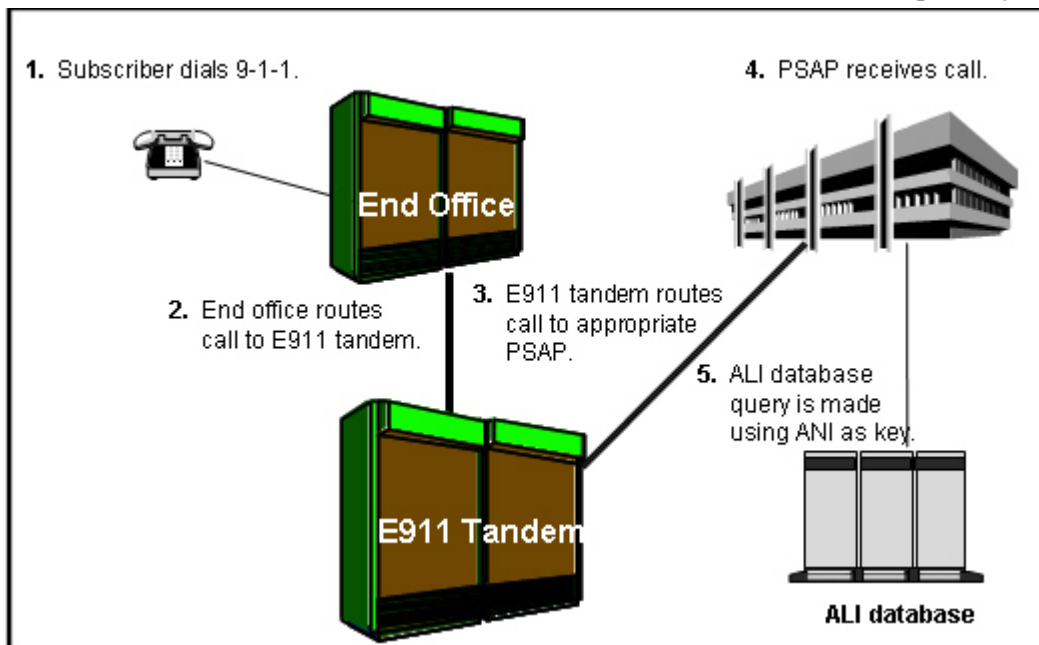
Locations and E911 calls

The MCS system provides preferential treatment for E911 calls. Here's what happens when an E911 call is made:

- 1 The MCS user dials 911.
- 2 The call comes into the end office and is sent to the E911 Tandem.
- 3 The tandem switch determines the ERL from the location provided by the calling party and routes the call to the local PSAP over the gateway route specified in the ERL. On-site notification (OSN) is provided using the target instant messaging account configured in the ERL.

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- 4 The PSAP receives the call with ANI information provided.
- 5 The PSAP queries the ALI database for the geographic location for the caller, and reestablishes the call in the event the call terminates unexpectedly.



How MCS access clients select their emergency location

The MCS access clients (Multimedia PC Client, Multimedia Web Client, i2002 and i2004 Internet Telephones) present a list of the locations defined for a service domain to users registering for service on those devices. The list of available locations is presented on the MCS access clients to provide the user with the ability to select the most appropriate location based on the current physical location of the client. The selected location is then used for the proper processing of E911 emergency calls from that client device.



Note: Locations that are associated (referenced) with some entity cannot be deleted from the system until all reference dependencies are removed.

Understanding emergency call priority

Emergency calls are given the same priority as non-emergency calls with respect to RTP Media Portal and PRI gateway resources. As a result, emergency calls will not succeed if these resources (RTP Media Portal ports, PRI gateway trunks) are not available.

On the SIP Application Module, however, emergency calls are handled a bit differently than non-emergency calls. If authentication is turned on, emergency calls will not be authenticated since this could potentially deny a user access to calling an emergency number if they do not know the correct password. To avoid this situation, emergency calls are never authenticated.

Also, the SIP Application Module always attempts to process emergency calls, even when it is in an overload (high memory and/or processor usage) condition, while new incoming calls will not be processed. Extremely large numbers of simultaneous emergency calls may prevent some emergency calls from completing successfully due to SIP Application Module resource limitations.

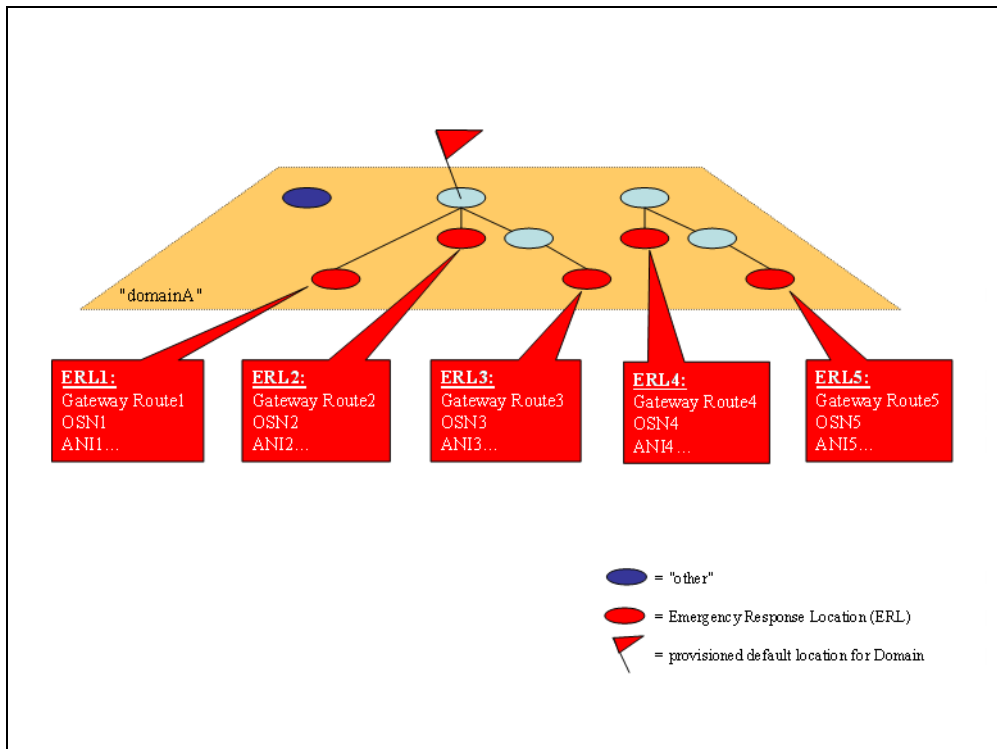
PSAP callbacks to the emergency caller when the system is in overload will not be given preferential treatment. They will be handled the same as normal incoming calls and may not successfully reach the emergency caller.

Working with Emergency Response Locations

A location can be defined to be an Emergency Response Location (ERL). An ERL is used as a repository for the following information required to properly process emergency calls. See the following figure.

- the gateway route - the first trunkgroup in the route will attempt to route the call.
- On-Site Notification (OSN) data. The OSN Instant Message (IM) is optional and only applies to Enterprise ERLs.
- Automatic Number Information (ANI). The ANI is required for the following reasons:
 - to associate the SIP caller with a civic address. The ANI has a civic address registered in the ALI.

- To allow the operator a means to call back the originator of the call.

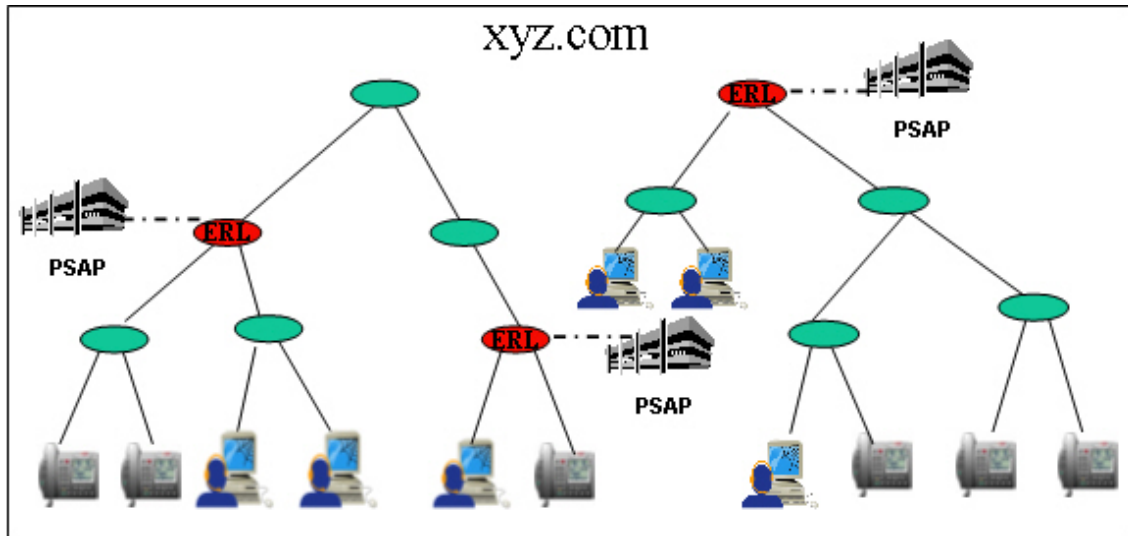


Emergency call support

These are the main things to consider for emergency call support:

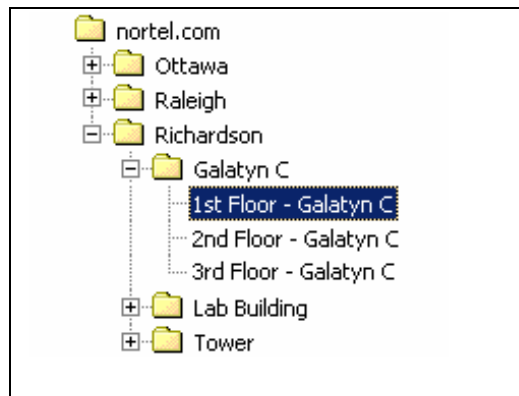
- each branch in the location tree hierarchy must have one and only one ERL somewhere in the branch
- the ERL does not necessarily have to be the leaf location, but two ERLs cannot be assigned on the same branch (in other words, an ERL cannot have another ERL in its child location subtree).
- Provisioning Client menus prevent multiple ERLs from being defined in the same branch (the **Location Services > ERLs** menu option is not present for locations defined below an existing ERL in the location tree hierarchy), but they do not require an ERL to be defined for each branch. It is left up to the administrator to enforce this.

The following figure shows an ERL location tree example for the *xyz.com* domain.



Example of creating a location hierarchy

The following figure shows an example of a location hierarchy.



The location hierarchy within the *nortel.com* domain is created as follows:

If you create this hierarchy...	The following location definitions apply...
Ottawa, Raleigh, Richardson, Galatyn C, Lab Building, and Tower	must all exist as locations but must not be defined as ERLs.
1st Floor - Galatyn C, 2nd Floor - Galatyn C and 3rd Floor - Galatyn C	must all exist as locations first, but they must also be further defined as ERLs in order to provide E911 capabilities to the "Galatyn C" area.



Note: If Galatyn C is defined as an ERL, the provisioning menus would not allow 1st Floor - Galatyn C, 2nd Floor - Galatyn C or 3rd Floor - Galatyn C to be defined as ERLs. In this case, these three locations beneath the ERL would represent locations with a more granular scope than that of the Galatyn C ERL.

Selecting a location

As part of the login process, the Multimedia PC Client, Multimedia Web Client, and the i2002 and i2004 Internet Telephones prompt a user with a drop down list of locations to select from.

In order to specify the current physical location of the client being used, the user selects an appropriate location from the presented list. On the client is the set of locations defined in the user's domain. By choosing a leaf location during the login process, the user is also specifying how E911 calls are processed from that client set. The selected location is used for emergency calls and any other location-based services.



Note: The first user to log into an i2002 or i2004 Internet Telephone will always be prompted to select their location, even if the device's location has already been provisioned by the administrator. If the device's location has already been provisioned, this provisioned location will be highlighted by default when the first user logs into the device to prevent the user from having to scroll through a series of menus to find their location.

Location descriptions

The displayed location drop down list is a list of the location descriptions, a user-friendly, shorter description of the complete location. The user is provided with a location menu to choose from the list of locations. The location description, a more casual description of the ERL, is displayed in the list. For example, NGC, 2nd Floor is displayed in the list instead of the MSAG or physical address of the following address: 2380 Performance Dr., Richardson, TX 75082, Floor 2.

A previously selected location is always put at the top of the location drop down list so the user does not have to scroll through numerous locations every time they login.

Location categories

Locations can also be categorized under parent locations, which themselves can be defined under higher-level parent locations. The resulting tree-like hierarchy allows easy navigation to a leaf location, even when the list of locations is large. For example, assume a user is part of the *nortel.com* domain. (See the location hierarchy figure that follows.)

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Two top-level locations, Richardson and Ottawa, are defined within the *nortel.com* domain. When a user logs into the Multimedia PC Client, Multimedia Web Client, or, i2002 or i2004 Internet Telephone for the first time, they can choose either Richardson or Ottawa as a location.

The next level of locations is then displayed - possibly describing various campuses or buildings within the selected city. Once a building or campus is chosen, the location list for that location level is displayed, from which the user can select their specific location.



Note: The user can only select leaf locations from the list.

How the "Other" location entry is used

The "Other" entry is always included in the displayed location list for the following reasons:

- in case the user is in an area not encompassed by a provisioned ERL
- if the user is not familiar with their current surroundings
- as a default value for first time installation

If the user selects the "Other" entry from the list, a warning is displayed indicating that a location was selected that may affect the user's emergency services. This means the PSAP operator will ask the caller for their physical location, as the PSAP operator will not have this information. The emergency call may terminate to the incorrect PSAP if the "Other" location or an incorrect location is selected. This is only an issue when the MCS system is connected to

- more than one PSTN system
- a PSTN system which spans more than one PSAP area.

If no location is selected by the user, then the "Other" location is used by default.

Benefits of a user choosing a location

The benefits of a user being able to choose an appropriate location are the following:

- Zero-cost moves of the Multimedia PC Client, Multimedia Web Client, and the i2002 and i2004 Internet Telephones within the enterprise, since no administrative intervention is required.
- A consistent solution across all clients (i2002 and i2004 Internet Telephones, Multimedia PC Client, Multimedia Web Client).
- A solution that can span across the breadth of the enterprise network (and can penetrate firewalls, and traverse Network Address/Port Translation devices).
- Allows for movement within defined locations, for example a user can move between ERLs and still obtain proper emergency connectivity - as long as this is done within the user's parent domain.



Note: the selected location identifies the location of the device, not necessarily the location of the user. A user could be logged into numerous devices simultaneously, so the selected location indicates the location of the device the user is calling from.

If no location is selected (for example, the "Other" location presented in the location list is selected), emergency calls are routed to the default gateway. The default gateway is the gateway specified when the "Other" location is provisioned as an ERL. If the "Other" location is not provisioned as an ERL, normal telephony translations will occur if a user with the "Other" location selected makes an emergency call.

All clients or devices will have the location of "Other" by default.

Third party clients and emergency calls

Other MCS clients (third-party devices, including the MSN client) connected to the MCS system can also dial emergency numbers. Emergency calls from these clients or devices are processed using the location associated with the user (through provisioning).

While this mechanism does not provide the same location selection flexibility on third-party clients or devices as that offered by the Multimedia PC Client, Multimedia Web Client, and the i2002 and i2004 Internet Telephones (for example, these clients cannot move around as freely, moves may require administrative changes, and so forth), it does provide a means for properly processing emergency calls from these clients or devices.

When an emergency call is initiated from a third party client or device, the call is processed according to the location associated with the originating user's account:

- The emergency call is routed to the gateway provisioned in the ERL. If the associated location is not provisioned as an ERL, then normal telephony translations will occur.
- If no location is associated with the user, then location precedence rules are applied to identify an appropriate location (the domain's provisioned default location, or the domain's "other" location) and the emergency call is processed accordingly.
- If the domain's "other" location is not provisioned as an ERL, normal telephony translations will occur.

The importance of choosing the right location

A user chooses a location on login, but is free to change their location at any time on the client. It is recommended that the user select the location that most accurately reflects their current geographic location.

Chapter 3

Setting up the MCS system for E911



Note: You must have system administrator rights to perform many of the tasks in this section.

Topics in this section

- [“Understanding administrator roles and E911” on page 17](#)
- [“Overview of the MCS E911 Network Architecture” on page 18](#)
- [“Emergency numbers and aliases” on page 20](#)
- [“Adding gateways, routes, and trunkgroups” on page 24](#)
- [“E911 translation and routing” on page 25](#)

Understanding administrator roles and E911

As a system administrator you have the rights to provision everything in the MCS system, including the following E911-related fields:

- emergency numbers. It is recommended that emergency numbers are provisioned last, after the locations and ERLs are provisioned.
- emergency aliases
- gateways



Note: The system administrator may not be the same person that will provision locations and ERLs.

Since the system administrator may not have enterprise specific information (for example, campus building names, OSN IM address, and so forth), it is most likely that the domain administrator will create the location tree and ERLs.

As a domain administrator you have the rights to provision

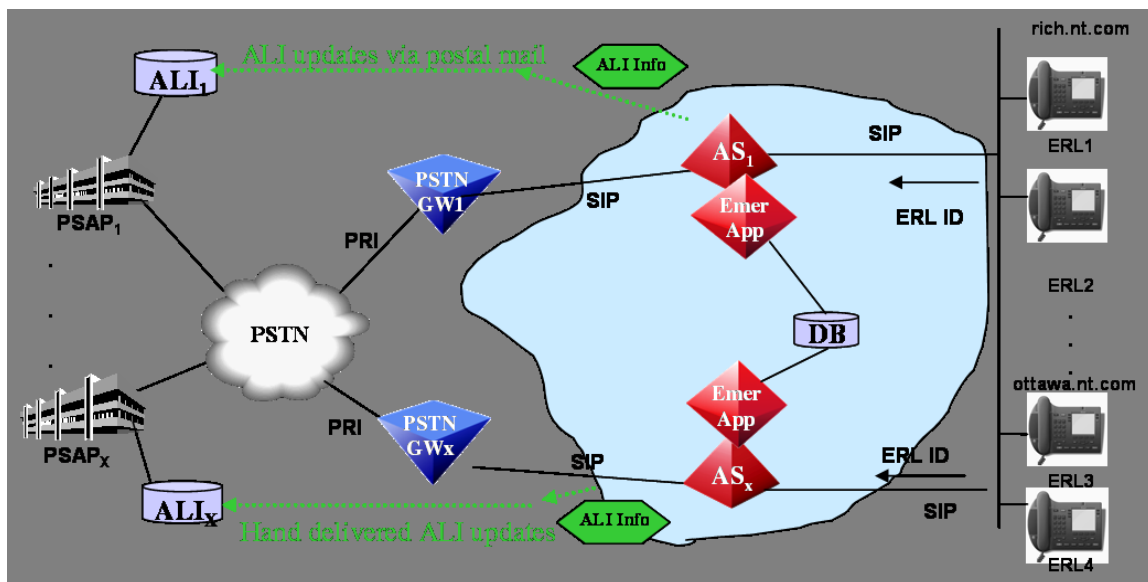
- a default location to associate with a user
- location fields for domains, subdomains, and users
- domain-level "Location Services" fields



Note: If the customer already has telephony-routes for 911 (for example, telephony routes provisioned in MCP 2.0), the telephony routes can be removed after everything else is provisioned (such as ERLs).

Overview of the MCS E911 Network Architecture

The following is an illustration of the MCS E911 network architecture.



How an emergency call works in the MCS network

In order to provide support for E911 emergency calls, the following steps must be performed:

- 1 The MCS network administrator (E911 administrator) defines generic locations within the enterprise using the Provisioning Client in accordance with local emergency laws as they apply to enterprise/PBX systems.
- 2 These generic locations are further defined as Emergency Response Locations (ERLs), with the Gateway Route, ANI(s) and optionally OSN instant message details configured for each ERL.
- 3 Once all ERLs are provisioned, the E911 administrator downloads the ERL list (a comma separated value (CSV) file) by clicking the [Get Printable ERL List](#) link on the Emergency Response Location Management page.
- 4 The ERL list can optionally be sent via certified postal mail (snail mail) to the PSAP to update the ALI database with the new ERL and ANI information. This is done in accordance with local emergency legislature as it applies to enterprise systems.
- 5 Various components of the system are provisioned with location information.
- 6 Users logging in to i2002 and i2004 Internet telephones, Multimedia PC Clients, and Multimedia Web Clients are prompted to select their current location from a list of ERLs. The selected location is stored for use in processing E911 calls from these clients.

E911 emergency calls may now be completed successfully to the local PSAP – assuming the user selected the correct location.



Caution: If an emergency call is made from an i2002 and i2004 Internet Telephone, Multimedia PC Client, or Multimedia Web Client without selecting a location (or with an incorrect location selected), the emergency call may be routed to the incorrect PSAP.

Emergency numbers and aliases

Emergency numbers and aliases are defined on a per-system basis, therefore, they do not need to be provisioned for each domain.

Emergency numbers differ from country to country. In scenarios where an MCS system serves users located in two or more areas with different emergency numbers, emergency numbers for all areas served must be provisioned as emergency numbers. A log is generated each time emergency numbers are added or deleted.

Dialing an emergency number

When a user makes a phone call, the number dialed is compared against the list of provisioned emergency numbers to determine if the call is an emergency call. Comparisons are done using a "starts-with" matching condition, so a user dialing "91111" will match a provisioned "911" emergency number. Any digits or characters dialed after a match will be removed, so the number "91111" will be translated to "911" before being routed out the gateway to the PSAP.

To prevent users from being provisioned with usernames the same as emergency numbers, the emergency numbers database table is queried each time a new user is added to verify that no conflicts exist. If an emergency number the same as the given username already exists, an error message indicating this is displayed to the administrator. Similarly, if an administrator attempts to add an emergency number that has already been assigned as a user's username, or one that matches using "starts-with" matching, an error message is displayed instructing the administrator to first delete the user before adding the emergency number.

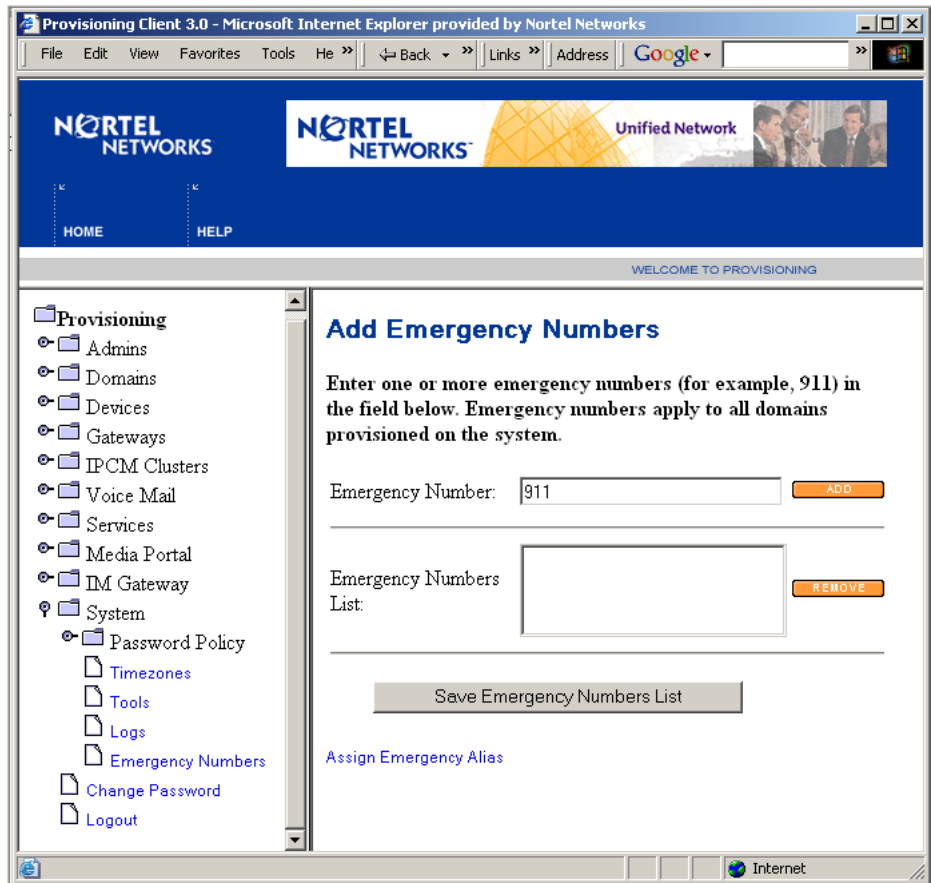
Recommendations and examples of common emergency numbers are described in the IETF "Emergency Services for Internet Telephony based on the Session Initiation Protocol (SIP)" Internet draft (<http://www.ipitel.org/info/players/ietf/emergency/draft-schulzrinne-sipping-sos-04.txt>)

Adding an emergency number

The **System > Emergency Numbers** menu option allows an administrator to provision an emergency number for a system.

To add an emergency number

- 1 Click the **System > Emergency Numbers** menu option. The Add Emergency Numbers page appears.



- 2 Enter one or more emergency numbers in the field provided.
- 3 Click **Add**. The emergency number appears in the window. To remove a number from the list, click **Remove**.
- 4 Click **Save Emergency Numbers List** to save all numbers. A message displays that the Emergency Numbers List was successfully updated.

Assigning an emergency alias

Emergency aliases can be assigned to emergency numbers. For example, 9911 could be defined as an alias to the emergency number 911, in case users are used to dialing a 9 to get an outside line before making a call.

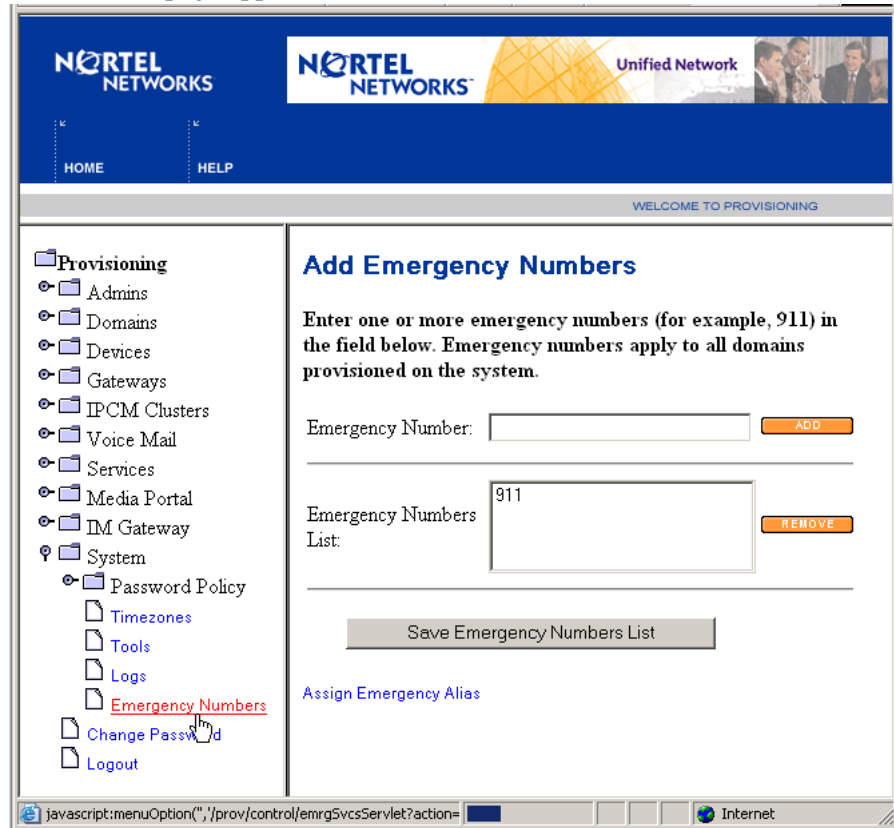
Emergency aliases resolve to the actual emergency number prior to going out the gateway, so if a user dials the emergency alias 9911, this would resolve to 911 and 911 would be sent out the gateway provisioned against the ERL selected by the user. Emergency aliases also use the "starts-with" matching condition, therefore, dialing 9911111 would match against the 9911 alias.



Note: The system administrator may not know all the emergency aliases required by the enterprise up front. Therefore, emergency aliases can be added at any time, once the need arises.

To assign an emergency alias for a number

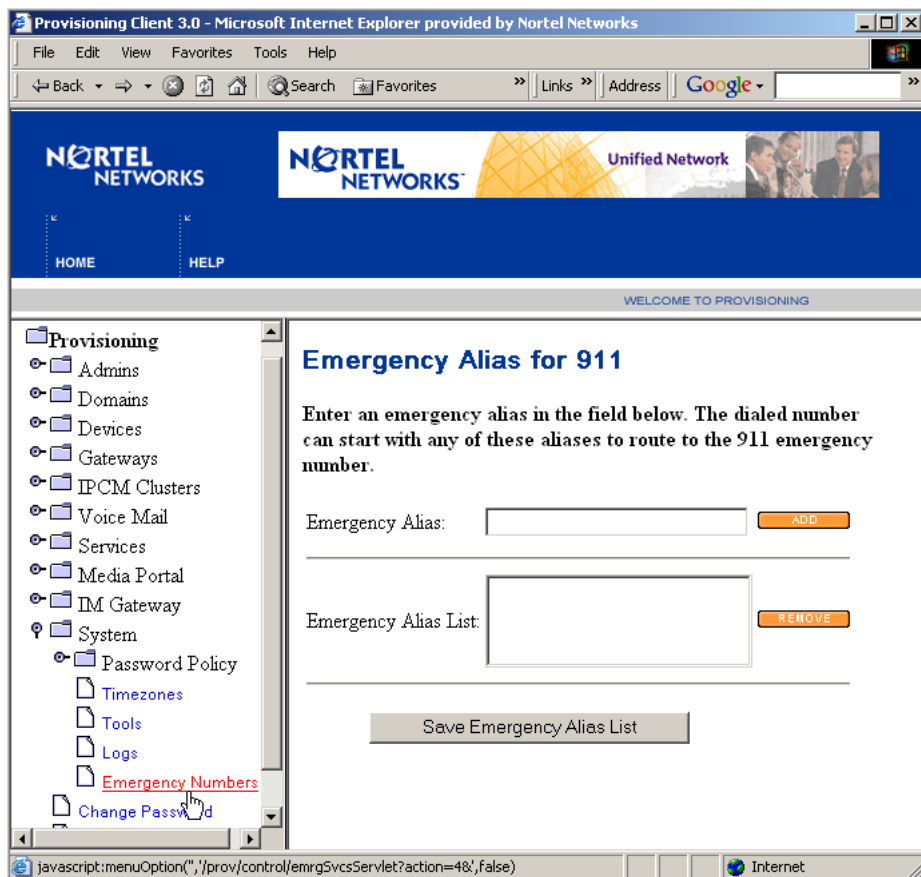
- 1 Click the **System > Emergency Numbers** menu option. The Add Emergency Numbers page appears.



- 2 Click the [Assign Emergency Aliases](#) link. The Emergency Alias Management page appears.

Emergency Alias Management	
Emergency Number	Alias List
911	Details

- 3 Click the [Details](#) link for the number the alias is for. The Emergency Alias Management page appears.



- 4 Enter an emergency alias in the field provided.
- 5 Click **Add**. The number appears in the Emergency Alias List. To remove a number from the list, click **Remove**.
- 6 Click the **Save Emergency Alias List** to save all aliases. A message displays that the Emergency Alias List was successfully updated.

Adding gateways, routes, and trunkgroups

Before provisioning an ERL, a gateway that has direct connectivity to the PSTN and the local PSAP must be provisioned to route the emergency call.

Using the Provisioning Client, the system administrator provisions the system level gateway, trunkgroup, and route that will be referenced by domain administrators when defining ERLs for their own domains.



Note: The initial default location association for a new gateway is the system domain's "Other" location. However; you can make a more appropriate association by selecting any of the other defined locations in the drop down list for the system domain.

Gateway routes are needed for E911 service to associate the domain to a gateway. Since an ERL is associated to a gateway route, the system administrator should provision at least one gateway route before the domain administrator can start provisioning ERLs. The gateway route that is associated with a domain will appear on the ERL Details page in the gateway route drop down list.

In addition, the system administrator should provision a gateway trunkgroup. The ERL will always use the first provisioned trunkgroup, even if there are several trunkgroups provisioned.

For information on provisioning gateways, routes, and trunkgroups, see the *Provisioning Client User Guide (NN10043-113)*.

E911 translation and routing

In MCP 3.0, when ERLs are properly defined (with gateway routes for domains and subdomains provisioned directly in ERLs), any additional telephony translation to obtain the gateway routes is not required for the forwarding of emergency calls.

However, when ERLs and emergency numbers are not provisioned (such as in the previous MCP releases), the MCP 3.0 system depends on domain and subdomain translation and routing for forwarding E911 calls.

Chapter 4

Provisioning E911 locations



Note: You must have domain administrator rights to perform the tasks in this section.

Topics in this section

- [“Overview of enterprise and residential Emergency Response Locations \(ERLs\)” on page 27](#)
- [“Viewing system log files” on page 30](#)
- [“Creating an enterprise ERL” on page 31](#)
- [“Viewing/modifying an enterprise ERL” on page 34](#)
- [“Deleting an enterprise ERL” on page 37](#)
- [“Creating a residential ERL” on page 40](#)
- [“Modifying/deleting a residential ERL” on page 43](#)

Overview of enterprise and residential Emergency Response Locations (ERLs)

Once more locations have been added to the location hierarchy, you can use the **Location Services > ERLs** submenu option to further refine locations into ERLs. The domain administrator then enters the following information:

- gateway route (obtained from the system administrator)
- one or more ANIs for callback
- OSN information

Guidelines for setting up enterprise ERLs

The following applies to an enterprise (or carrier-hosted) configuration of an ERL. ERLs:

- are defined on a per-domain basis.
- are assigned at least one 10- 22 digit PSAP callback number, also known as the automatic number identifier (ANI).
- must have a minimum of one ANI. (There is no maximum number of ANIs that can be assigned to an ERL.)
- generate a log file each time an ERL is added, modified or deleted.

Understanding ANIs

ANIs are a 10-digit Direct Inward Dialed (DID) number that is assigned to an emergency caller and is used by the PSAP to identify the emergency caller's location.

The following applies to ANIs:

- Each ANI must be unique and should be verified that they are unique before provisioning. The provisioning module will verify ANIs are unique within a domain when they are entered during ERL provisioning
- Each ANI added will count against the system defined maximum user count value assigned to a domain.
- An ANI is assigned to a caller for two hours, after which calls made to the ANI will longer associate to the caller.
- If more than one ANI is assigned to a given ERL, the oldest used ANI is chosen for the current call.
- If there are more concurrent callers making emergency calls than ERL ANIs provisioned, the oldest ANI is assigned to the most recent emergency caller. For example, if two ANIs are provisioned for an ERL and three users are making emergency calls, the ANI assigned to the first emergency caller will be given to the third emergency caller. The PSAP can no longer reach the first emergency caller after the third caller made the call. To avoid this situation, an adequate number of ANIs must be provisioned for an ERLs service area.

How OSNs work

On-site notification is accomplished by sending an instant message (IM) to the on site personnel such as the front desk or local security guard. The IM appears at the security or administrative desk equipped with either a Multimedia PC Client, or i2002 or i2004 Internet Telephone.



Tip: If a notification has to be sent to a second location, then that route can be set up in the OSN user's simultaneous ring list.

The following applies to OSNs

- OSNs are required for enterprise sites larger than 40,000 square feet that do not have an address associated with a user's device or location from which the user is calling an emergency number.
- The OSN can optionally notify on site security or administrators, by means of an IM (instant message), of the emergency.



Note: Since the intent of the OSN instant message is for notification only, there is no capability to respond to the OSN instant message. The OSN capability enables the personnel to direct emergency teams to the correct location for faster response.

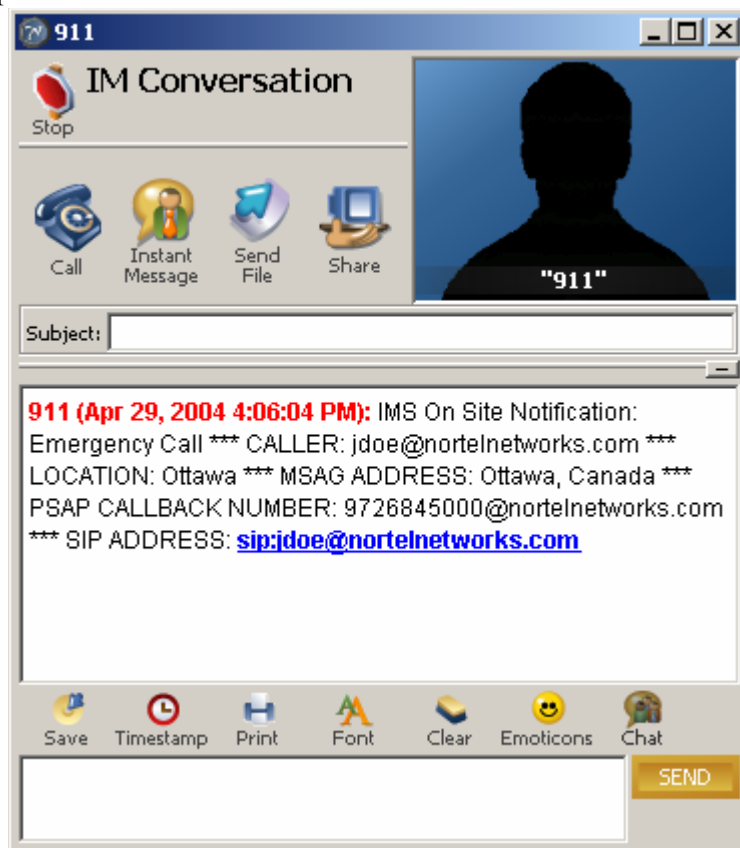
- The OSN must provide 24/7 on-site security support that is capable of receiving the IM notifications.
- The OSN generates a log file on the SIP Application Module to provide an electronic audit trail each time an OSN instant message is sent. Details such as the date, time, emergency caller and location are included in the log file.

The following table describes the contents of the OSN instant message:

IM contents	Description
Caller	First and last name of the user making the call.
Location	Contains the location description.
MSAG address	The house number and street address from the database of street names.

PSAP callback number	The ANI that was sent to the PSAP
SIP Address:	SIP address of the emergency caller

The following figure shows a sample IM as it would appear at the local security personnel's client.



Viewing system log files

Logs are generated when an ERL or location is added, deleted, or modified. Each log is slightly different but can contain the following log entries:

- domainName
- location

- locationDescription
- locationId
- osnImAdd
- erlTyper
- gatewayRoute
- gatewayRouteID

For detailed information on accessing and viewing system log files, see the *MCS 5100/MCS 5200 System Management Console User Guides*.

Example audit log

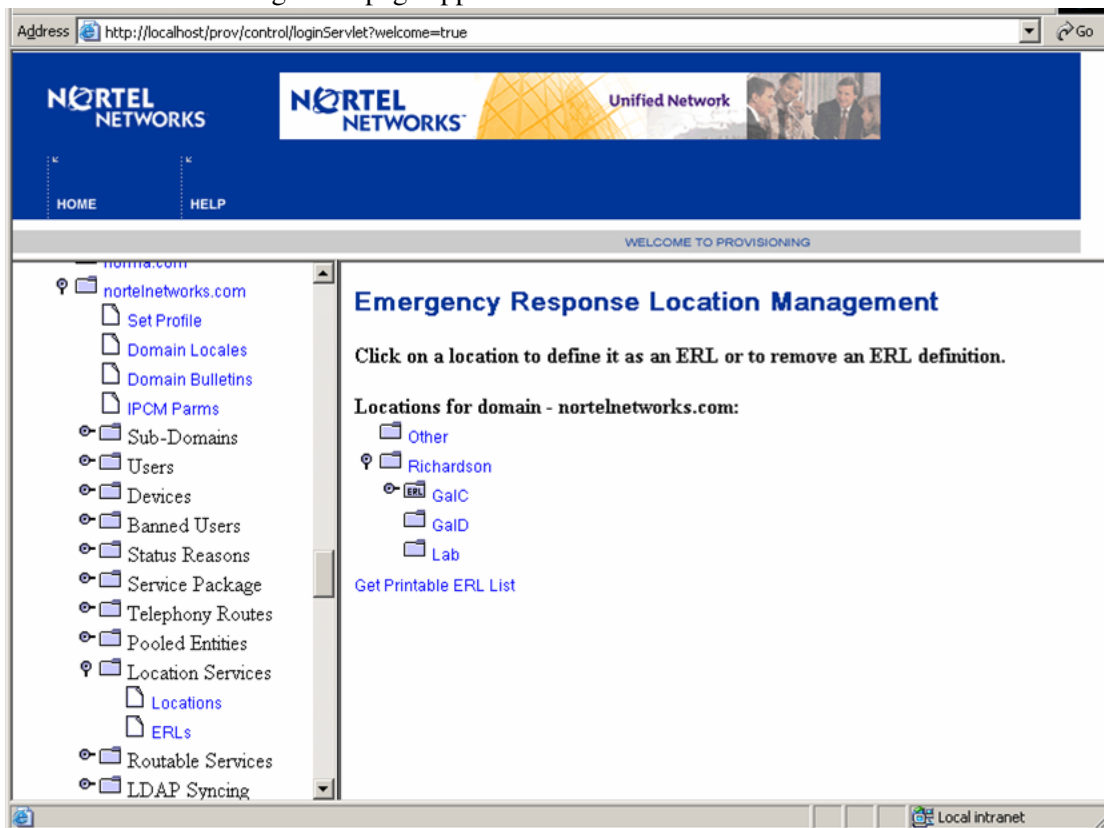
```
Prov      PROV606 APR19 17:05:18 2105 SUMM INST0
          Provisioning_Client.Provisioning Security Audit Log:
          RequestType:ProvClient, Administrator:prov, Command:Add
          ERL ( addErl ) , IP Address:47.102.116.240, Comments:
          String domainName =[nortelnetworks.com]& String
          locationName =[Chicago]& DetailedErlInfo =[ Erl
          Type:enterprise Osn IM Addr:secuity@nortelnetworks.com
          [ANI:9726856688@nortelnetworks.com] GatewayRouteId:405]&

Prov      PROV606 APR19 17:06:13 2206 SUMM INST0
          Provisioning_Client.Provisioning Security Audit Log:
          RequestType:ProvClient, Administrator:prov,
          Command:Modify ERL ( modifyErl ) , IP Address:47.102.116.
          240, Comments: String domainName =[nortelnetworks.com]&
          String locationName =[Chicago]& DetailedErlInfo =[ Erl
          Type:residential GatewayRouteId:405]&
```

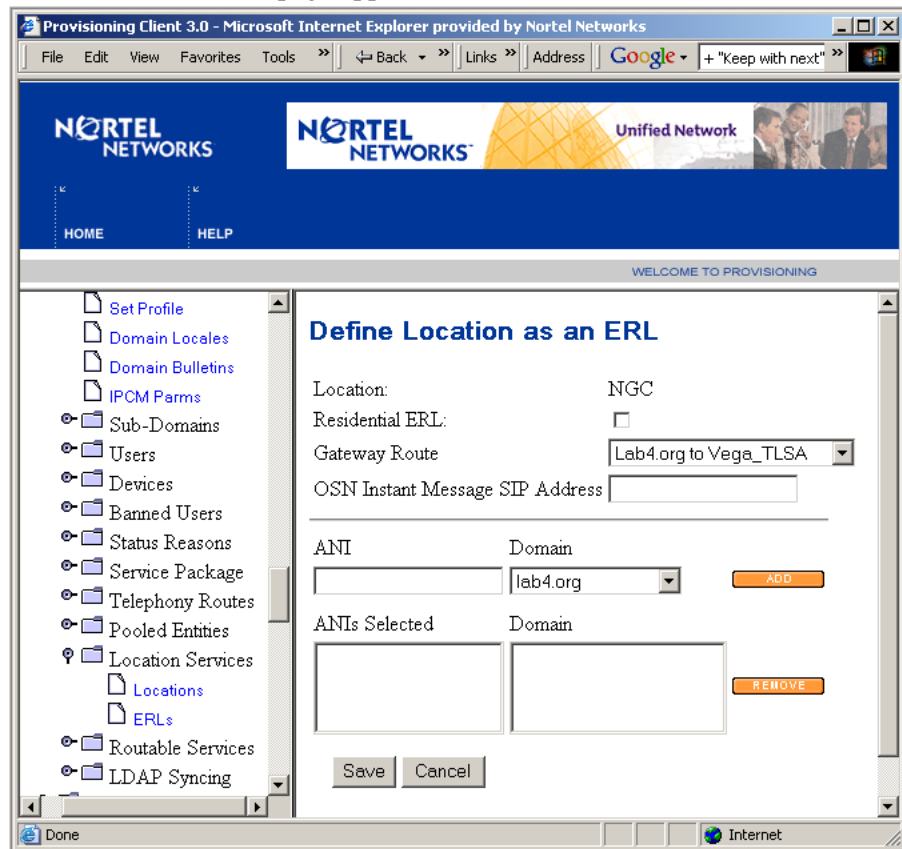
Creating an enterprise ERL

To create an enterprise ERL

- 1 Under the domain where you want to create an ERL, click the **Location Services > ERLs** menu option. The Emergency Response Location Management page appears.



- 2 Click an existing location name to define an ERL for that location. The Define location as an ERL page appears.



- 3 Complete the fields to define a location as an ERL as described in the following table

Field	Description
Residential ERL	Indicates whether an ERL is a residential ERL. Note: This field is left unchecked for enterprise and carrier-hosted configurations.
Gateway Route	The gateway route used to terminate to the local PSAP. All gateway routes for the current domain are listed in the drop-down menu. Selecting the gateway route is enough to terminate the call, because the application server automatically uses the first trunkgroup it finds in that route. Note: gateway routes should be provisioned before defining an ERL.

Field	Description
OSN Instant Message SIP Address	The SIP address (for example: FrontDeskSecurity@nortelnetworks.com) to send an OSN instant message to when a user with the current ERL selected as their location makes an emergency call. Maximum length = 60 characters. The OSN field may be left blank to disable OSN instant messaging on this ERL.
ANI	ANIs entered in these fields are added to the ANIs Selected list when the ADD button is pressed. The ANI is an E1.64 address that the PSAP uses to callback the emergency caller. ANI length is between 10 and 22 digits.
Domain	The selected domain or subdomain is associated with the entered ANI.
ANIs Selected	A list of all ANIs associated with the ERL. Highlighting an ANI and clicking the Remove button removes the ANI from the list. There is no limit to the number of ANIs that can be added per ERL, but at least one ANI must be assigned. When an ANI is removed from an ERL, a warning message displays to indicate that emergency callback services may be affected. Note: ANIs count against the total number of subscribers in the system.
Domain	The domain or subdomain associated with each ANI. Highlighting an domain or subdomain and clicking the Remove button removes the ANI from the list.

- 4 Click **Save**. A message displays that the new ERL was successfully added.

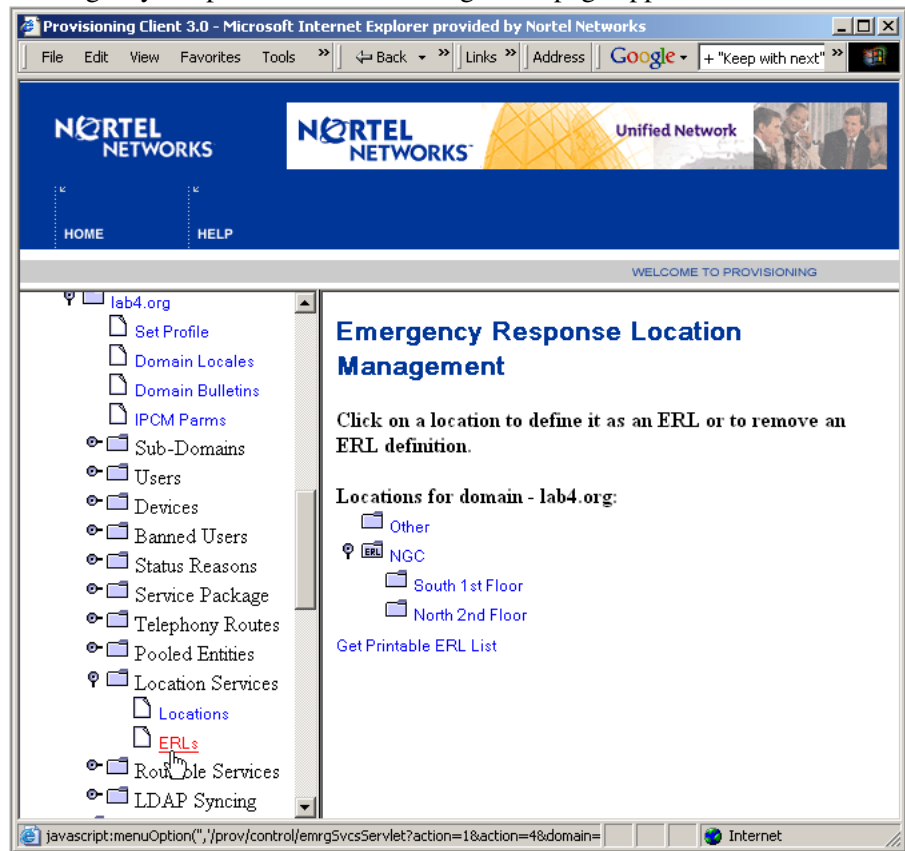


Note: A log is generated each time an ERL is added.

Viewing/modifying an enterprise ERL

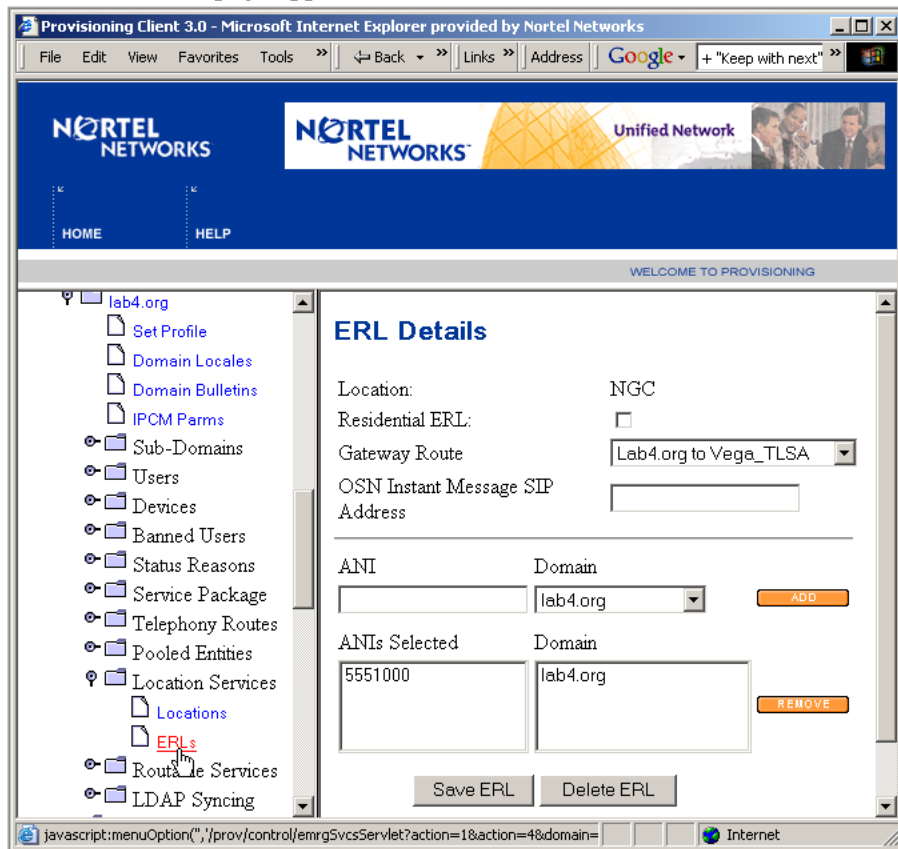
To view or modify details about an existing ERL

- 1 Under the domain where you want to view or modify details about an existing enterprise ERL, click the **Location Services > ERLs** menu option. The Emergency Response Location Management page appears.



Tip: The folder icon() to the left of the location name indicates which locations have already been defined as ERLs.

- 2 Click the ERL name (next to the folder icon) that you want to view or modify. The ERL Details page appears.



- 3 View or modify the enterprise ERL as described in the table on [page 33](#).
- 4 Click **Save ERL**. A message displays that the ERL was successfully modified.



Note: A log is generated each time an ERL is modified.

Deleting an enterprise ERL



Note: You must have system administrator rights to delete an enterprise ERL.

The following guidelines apply when deleting an ERL:

- Deleting an ERL does not delete the location. Locations must be deleted from the Location Management provisioning page under the **Location Services > Locations** menu option.
- Deleting an ERL does not remove the ERL and ANIs from the ERL and ANI database tables immediately. Instead, a timestamp of the current time plus two days (twice the longest configurable client re-registration interval) is written to the database tables' DEPRECATED field. This is required because users will not be forced to select a new location immediately if their currently selected location is deleted. The user will be prompted to select a new location only after they download the latest location list, which occurs once their reregistration interval expires.
- A deleted ERL will no longer appear on provisioning pages and is treated as if it was deleted.
- From a call processing perspective, the deleted ERL details are accessible for two days in case a user with a deleted ERL selected makes an emergency call.
- A process is run once every 24 hours to remove location and ERL database entries that have expired DEPRECATED field values. More details on this task can be found in [Chapter 6, “Updating the PSAP database](#).

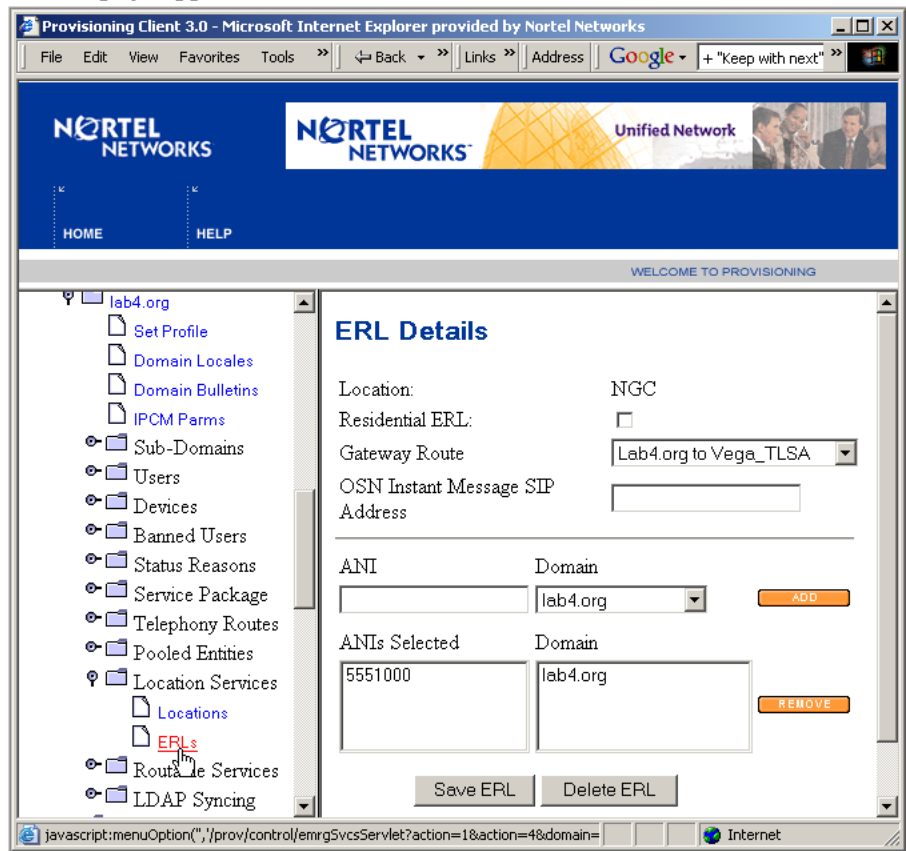
To delete an enterprise ERL

- 1 Under the domain where you want to delete an existing ERL, click the **Location Services > ERLs** menu option. The Emergency Response Location Management page appears.



Tip: The folder icon() to the left of the location name indicates which locations have already been defined as ERLs.

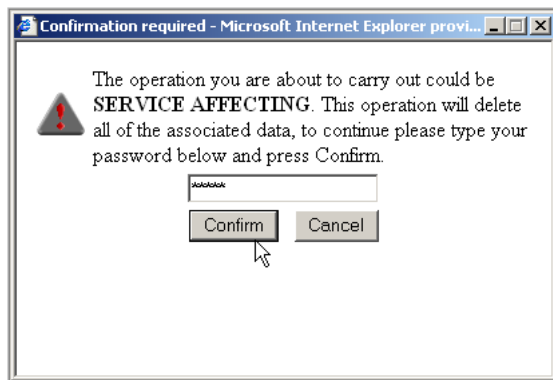
- 2 Click the ERL name (next to the folder icon) that you want to delete. The ERL Details page appears.



Note: If you do not have system privileges to delete an ERL, the **Delete ERL** button does not appear on the page.

- 3 Verify that this is the ERL you want to delete.
- 4 Click **Delete ERL** button. A confirmation box appears warning that deleting the ERL may be service affecting. If you wish to continue with the delete operation, enter a valid administrator password in the confirmation window

and click **Confirm**, or **Cancel**, to cancel the delete operation. A message displays that the ERL definition was successfully removed from the location.



Note: A log is generated each time an ERL is deleted.

Creating a residential ERL



Note: Each user must have a Public Charge ID provisioned for them. The user's Public Charge ID is a 10- 22 digit Direct Inward Dialed (DID) number that the PSAP uses to reach an emergency caller.

During call processing, if a user selects a location that is associated to a residential ERL, the PSAP will receive the user's Public Charge ID to identify the user in the ALI database.

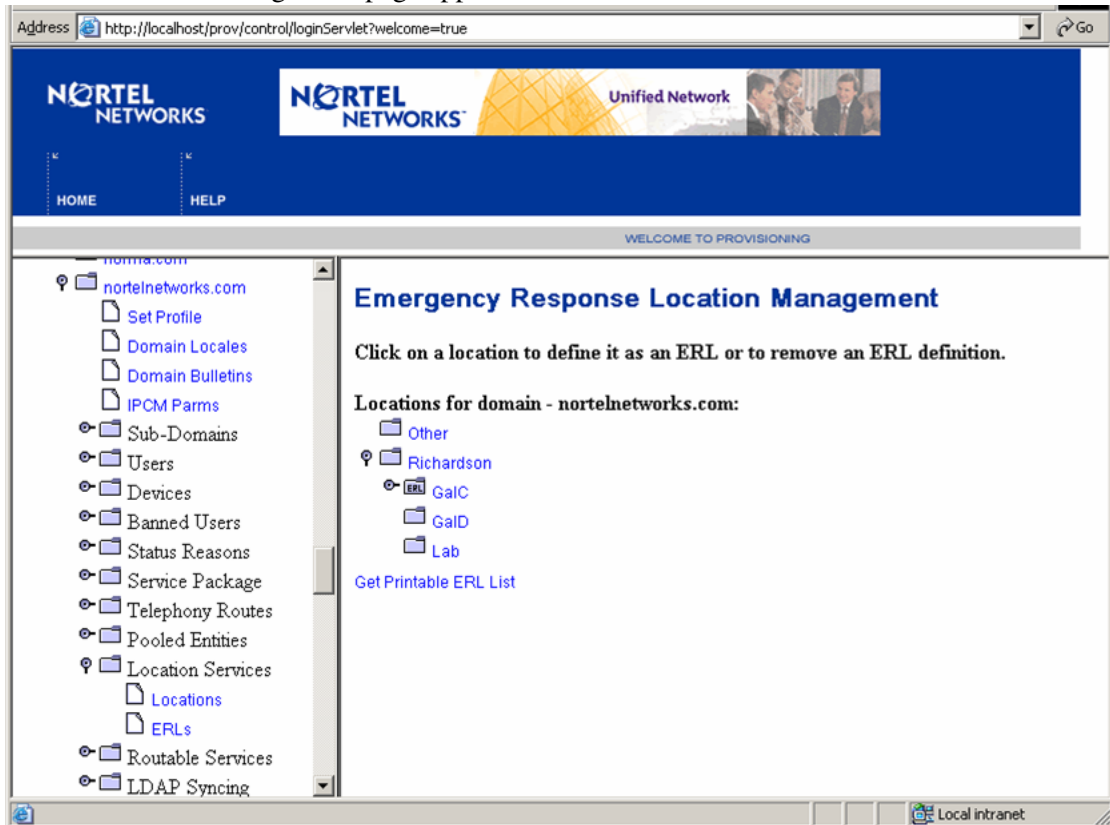
If the administrator neglects to provision the Public ChargeID for the user and that user makes an emergency call, then a log is generated that looks like following:

```
WARNING: A Residential Emergency Call is being processed
         from Location (WestRichardsonPSAP)
         MSAG ( local PSAP location ) . "
         The Public Charge Id is NULL for subscriber (will@techtrial.com)
         PSAP callbacks might NOT be possible for this subscriber.
<<END>>
```

The call should terminate, but without an ANI.

To create a residential ERL

- 1 Under the domain where you want to create an ERL, click the **Location Services > ERLs** menu option. The Emergency Response Location Management page appears.



- 2 Click an existing location name to define an ERL for that location. The Define location as an ERL page appears.

Provisioning Client 3.0 - Microsoft Internet Explorer provided by Nortel Networks

File Edit View Favorites To » Links » Address Google »

NORTEL NETWORKS Unified Network

HOME HELP

WELCOME TO PROVISIONING

Define Location as an ERL

Location: BL60

Residential ERL: ☒

Gateway Route: Lab4.org to Vega_TLSA

OSN Instant Message SIP Address:

ANI	Domain
	lab4.org

ADD

ANIs Selected	Domain

REMOVE

Save Cancel

- 3 Complete the following fields to define a location as an ERL as described in the table that follows. Note that once the Residential ERL field is checked,

some fields become inactive (appear grayed out on the page) because they are not applicable in the residential call.

Table 1 Residential ERL field descriptions

Field	Description
Residential ERL	Enter a check in the checkbox to indicate that this ERL is a residential ERL.
Gateway Route	Select (mandatory) a gateway route from the drop down list of gateway routes for the current domain to use to terminate to the local PSAP. In the residential configuration, ERLs are zoned by gateway.

- 4 Click **Save**. A message displays that the new ERL was successfully added.

Modifying/deleting a residential ERL

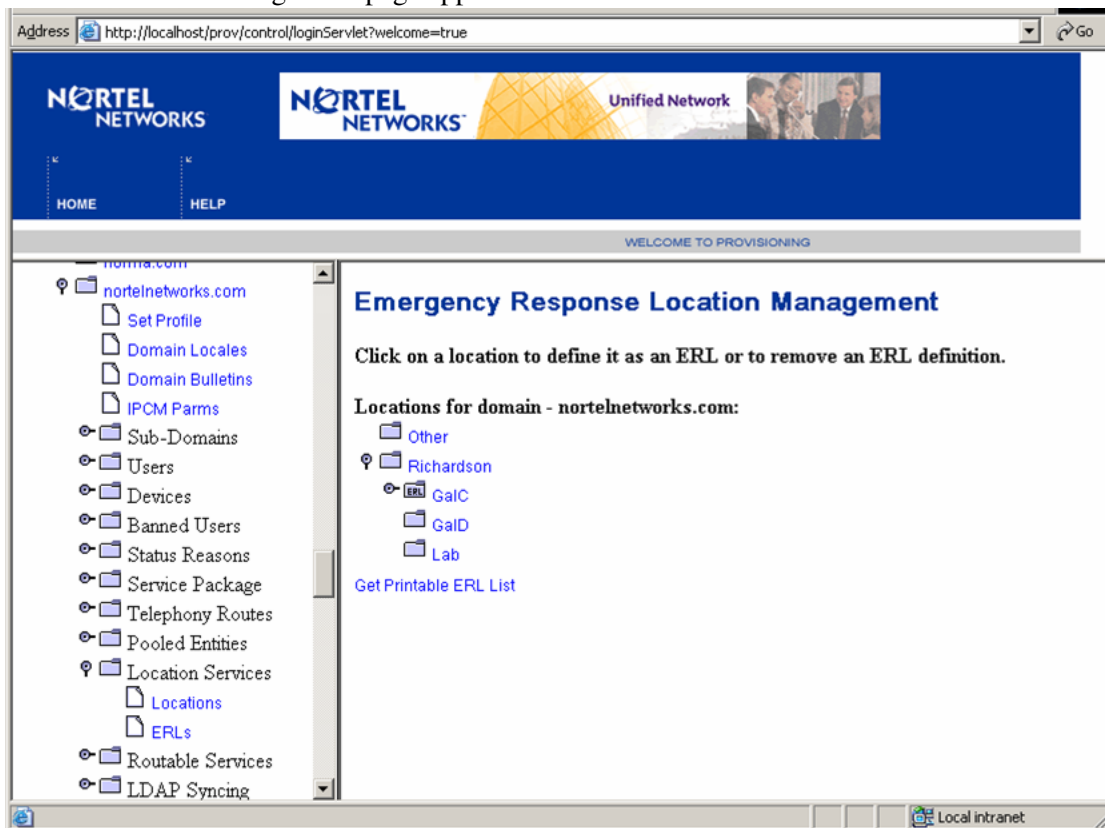


Note: You must have system administrator rights to delete a residential ERL.

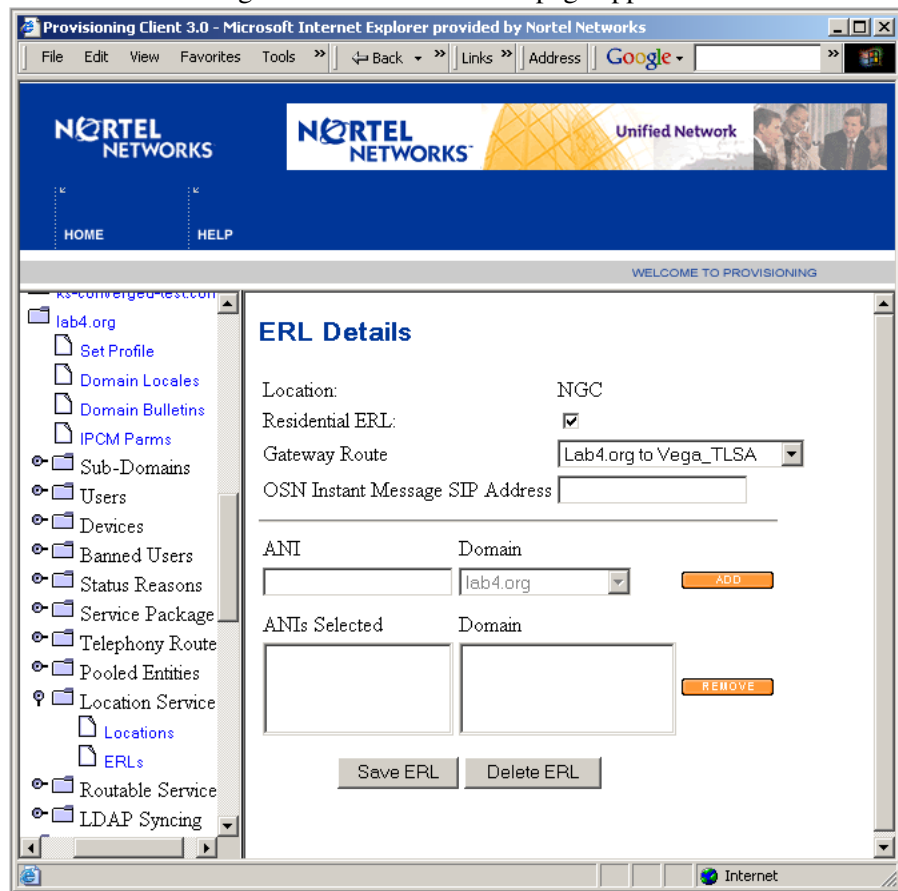
To modify or delete a residential ERL

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- 1 Under the domain where you want to modify or delete an ERL, click the **Location Services > ERLs** menu option. The Emergency Response Location Management page appears.

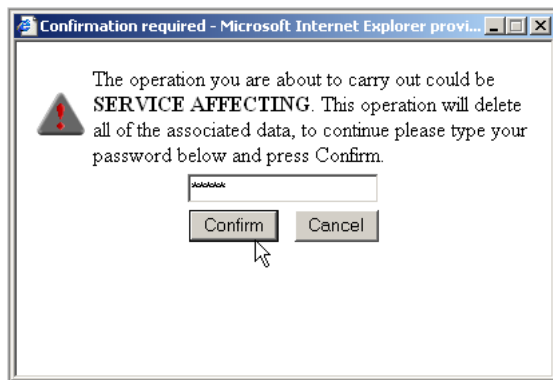


- 2 Click an existing ERL. The ERL Details page appears.



- 3 To modify a gateway route, select a new gateway from the drop down list of gateways. Click **Save ERL**. A message displays that the ERL was successfully modified.
- 4 To delete the residential ERL, uncheck the Residential Gateway checkbox and click **Delete ERL**. A confirmation box appears warning that deleting the residential ERL may be service affecting. If you wish to continue with the delete operation, enter a valid administrator password in the confirmation window and click **Confirm**, or **Cancel**, to cancel the delete operation. A

message displays that the ERL definition was successfully removed from the location.



Note: A log is generated each time an ERL is deleted.

Chapter 5

Emergency Application service

Topics in this section

- [“Overview of the Emergency Application \(EA\) service” on page 47](#)
- [“MCS access clients and the EA service” on page 48](#)
- [“Non MCS clients and the EA service” on page 49](#)

Overview of the Emergency Application (EA) service

The Emergency Application (EA) service performs following tasks:

- Queries the database module to obtain the ERL location, ANI, OSN information, user information, and so forth, upon an emergency number match.
- If the originator is in an enterprise location, temporarily associates the ANI with the user (for 2 hours).
- Modifies the INVITE sent to the Gateway to contain the ANI in the P-Asserted-Identity and Remote-Party-Id headers. (Residential users will use Public Charge Id, rather than an ANI provisioned on the ERL.)
- Performs OSN: If OSN is provisioned, builds and sends an Instant Message to the on-site personnel with the emergency caller’s details. (Not applicable to residential users.)
- Logs the call details for audit purposes.
- Disables authentication for emergency calls.

MCS access clients and the EA service

The following steps describe how the EA service works with the MCS access clients.

- 1 Sends the MCS clients location id in the “x-nt-location” header of the INVITE message.
- 2 Calls originated by other entities (for example, gateways, Media Application Server, older MCS access clients) will have their location id derived from the provisioned location infrastructure using the location precedence rules.
- 3 The SIP Application Module matches the Request: uri with the list of provisioned emergency numbers and triggers the EA service if a match occurs.
- 4 The EA service queries the database module for the gateway routes, OSN and ANI information using the location id. In this case, normal telephony translations to obtain the gateway routes are not performed.
- 5 The user's resource id and the current timestamp are stored against the ANI in the database module. If the PSAP needs to call back the user who dialed the emergency number, they can do so using this ANI. The following guidelines apply:
 - The ANI is assigned to the user for 2 hours, after which calls made to the ANI will no longer map to the user.
 - The ANI serves as an alias so that the user can still receive calls at his SIP address.
 - If more than one ANI is assigned to a given ERL then the ANI that was used longest ago is chosen and assigned to the current call.



Note: If more users in the same location make emergency calls than there are ANIs provisioned against that location, ANIs will be assigned to the most recent emergency callers. For example, if two ANIs are assigned to location "Lab 2" and three users with the "Lab 2" location selected make emergency calls, the first emergency caller will have his temporary ANI assignment stolen from him by the third emergency caller. PSAP callback to the first emergency caller will not work.

Retrieving the gateway route from the database module based on the location id ensures that the emergency call is routed to the PSAP tied to the location sent in the INVITE.



Note: To be able to support call retry in case the call to the PSAP fails, more than one trunk group should be specified.

Non MCS clients and the EA service

For non-MCS clients (for example, all other SIP clients) the domain administrator must associate a location to the subscriber ahead of time for the call to route. Otherwise, the location "Other" will be used to route the call.

Chapter 6

Updating the PSAP database

Topics in this section

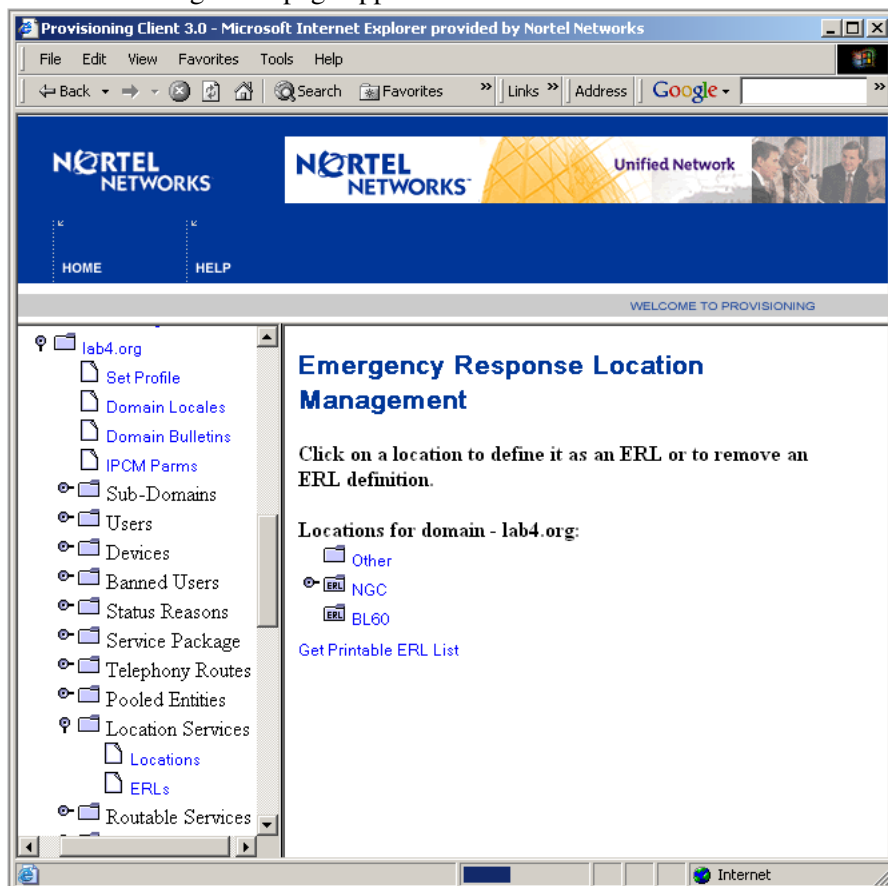
- [“Capturing ERL additions, deletions, modifications” on page 51](#)
- [“Removing deprecated locations, ERLs, and ANIs” on page 53](#)

Capturing ERL additions, deletions, modifications

An emergency services administrator is responsible for capturing any ERL additions, deletions, or modifications and sending a "snail mail" letter to the appropriate PSAP to instruct them to update their ALI database when an ERL change occurs. Because changes to ERLs should only occur very infrequently, this snail mail approach works just as well as much more expensive automated ALI database update solutions.

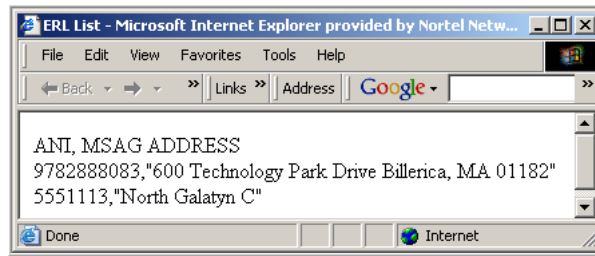
To display and print a list of currently provisioned ERLs for use in sending a snail mail letter to the PSAP for ALI database update purposes

- 1 Under the domain or subdomain where you want to capture the ERL changes, click the **Location Services > ERL** menu option. The Emergency Response Location Management page appears.



- 2 Click the **Get Printable ERL List** link. A new browser window opens that displays a text only comma separated value (CSV) listing of all ERLs. The list contains the following information about the ERLs:
 - ANI

- MSAG



- 3 From the browser window, you can either choose to print the list of currently provisioned ERLs to include in a letter to the PSAP for ALI database update purposes, or, close the window and return to the Provisioning Client GUI.

Removing deprecated locations, ERLs, and ANIs

A job is added to the nightly database cleanup activities to remove deprecated locations, ERLs and ANIs. The DEPRECATED fields in the database tables contain timestamps of when the locations, ERLs and ANIs are no longer valid. If the value in the DEPRECATED field is before the current date/time, the location or ERL is permanently deleted from the database table.

Chapter 7

Troubleshooting

This section provides information about issues and solutions that you may encounter with the E911 feature.

International support

- E911 is supported in North America only. Future development of this feature is required to interoperate with other emergency services outside the US and Canada.

Location

- It is possible for the user to select an incorrect location. The network has no way to verify that the location selected is correct.
- Only MCS access clients will permit users to participate in the selection of location at the client.
- Location support for pre-MCP 3.0 access clients is provided through the location associated with the user account.
- If an emergency call is made from an entity (other than an MCS access client) then the emergency call is routed according to that entities associated default location – or the Location Precedence Rules.
- If a user is moved between two different root domains or between subdomains whose root domains are different, then the user's Location will be changed to the new domains' default location. In all other cases it will remain the same.

Mobility

- Mobility of MCS access clients is supported across the enterprise network, for example, within the parent domain.
- Limited mobility is possible for non-MCS access clients within the same ERL service area.

Calls

- The Public Charge ID field for user accounts must contain a diallable directory number (DN) as this is used by the E911 operator as the call-back number should the operator ever have to re-establish the call. For this reason the “Public Charge ID” must be datafilled for proper operation of residential E911.
- There is no capability to respond to, or call back, an OSN message.
- Hold and transfer of emergency calls are not prevented. Ability of the originator to release an emergency call is allowed (terminator call control is not supported).
- M1 emergency calls made via the MCS and out a MCS-controlled gateway to the PSTN will be routed according to the location associated with the M1 in its Gateway datafill. If the associated location is an ERL then the emergency call will be routed accordingly. However; if it is not an ERL then the emergency call may be routed to the incorrect PSAP.
- PSAP calls back to the emergency caller will not be given preferential treatment when the system is in overload. They will be handled the same as normal incoming calls and may not successfully reach the emergency caller due to resource limitations.
- The number of ANIs provisioned per ERL may be less than the number of simultaneous emergency calls. In this scenario, the PSAP will not be able to callback one or more users because the temporary ANI assigned to those users will be assigned to a different user who placed an emergency call later.
- Call redirection (call forwarding) to an emergency number is not supported. This implies that adding CPL routes to forward callers to an emergency number is also not supported.

i2002 and i2004 Internet Telephones

- Restriction: handling of multiple users on a single piece of equipment. All users will have the same location because the location is assigned to the device; not to an individual user.
- Locations and ERLs should be provisioned before i2002 and i2004 Internet Telephones are provisioned so a default location for each device can be specified during provisioning. When an i2002 or i2004 Internet Telephone is provisioned, a list of available locations is presented to specify the location of the i2002 or i2004 Internet Telephone, if known. This default location appears at the top of the location list presented to the very first user registering on this device, making it easier for them to select their location.



Note: If i2002 and i2004 Internet Telephones are provisioned before provisioning ERLs, no default location can be selected for the device. In this case, the user must scroll through the location list to find and select their location.

- The first user to register on an i2002 or i2004 Internet Telephone device selects the location that will be used by all other users registering on the same device.

Foreign domains

- Foreign domains are not supported. Emergency calls that originate from a foreign domain and are then sent to the SIP Application Manager are not guaranteed to route to the emergency operator correctly.
- External SIP systems (for example, a competitor's system) can be linked to the MCS system by provisioning the external SIP system as a foreign domain. This allows calls to route between the two SIP networks. E911 calls that originate from one of these foreign domains will not map to an ERL, and, therefore, will not route to the gateway.

Translations

- Normal translations are bypassed. Thus, do not expect a domain's 'Telephony Routes' to work when an emergency number is dialed.

Gateways

- Gateways used to route emergency calls must support the SIP headers 'Remote-Party-Id' and 'P-Asserted-Identity' to deliver the originator's ANI to the PSAP.
- Gateways that do not support these headers will be limited to basic (non-enhanced) 911 services. Mediatrix gateways currently do not have support for these headers.

Appendix A

Upgrading from MCP2.0 to MCP3.0 release

In MCP 2.0, the SIP Application Module supports Instant Message notifications to a specified On-Site Notification (OSN) location whenever a user makes a call to an emergency number such as 911.

The MCP 2.0 software provides OSN using the same mechanism that allows users to push web pages and/or email links back to the originator of a call. In order to do this, an emergency number subscriber, an OSN subscriber for each OSN location, and a private telephony route to associate the emergency number to this subscriber would have to be set up using the Personal Agent. Also, since telephony routes are only unique within a subdomain, there cannot be more than one OSN location for each subdomain.

Upgrading to MCP 3.0

When the MCP system is upgraded to 3.0, the emergency subscriber can no longer be used. The OSN methodology using the ring list will also no longer work. In 3.0 the OSN information is associated when an ERL is provisioned. Also any number (or alias) that is provisioned as an emergency number cannot be a regular subscriber in the system. The administrator has to remove the emergency user (and or alias) for provisioning the emergency route. The OSN user should now be associated with the ERL.

One of the fundamental building blocks introduced by the location infrastructure is that of an “Other” location with each domain. Prior to this software release, there was no concept of location in the system; and, therefore, no automatic “Other” location association with each domain. During system upgrades, an “Other” location is provided for all existing domains being migrated to the new release. These “Other” locations are not, however, automatically defined as ERLs, so it is the administrator's responsibility to provision certain locations as ERLs once the upgrade is complete.

In order for the location infrastructure to accomplish its primary purpose, it introduces a new data association (location) with existing data structures. To maintain data integrity, this newly associated data will be populated with a default value for each affected data structure that is migrated as part of an upgrade. In most cases the default value for this new field is the “Other” location for the associated service domain, but in some cases it is defaulted to the “Other” location for the special system domain as described in the following table.

Data structure	New field	New field default value
Domain	Domain locations	Other
Subdomain	Domain locations	Other
Foreign domain	Location	Other
Gateway	Location	Other (for system domain)
Pooled entity	Location	Other (for system domain)
User data (subscriber)	Location	Use Domain Default Location (Other)
Devices (i2002 or i2004 Internet Telephone)	Location	Other

This feature also provides backwards compatibility for previous Bulk Provisioning Tool (BPT) versions.

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