



**Emergent Communications
NG9-1-1 Software Solutions for
Call Routing and PSAP Call Takers**

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Introduction

Emergent Communications offers the first totally “built from the ground up” NENA i3 Next Generation Internet Protocol (IP) standards based 9-1-1 emergency communications system (NG 9-1-1). Our software platform performed the basic call routing and delivery function used in the U.S. Dept of Transportation Proof of Concept 2007-2008 (US DOT POC)

https://www.its.dot.gov/research_archives/ng911/index.htm

NG 9-1-1 is designed to include shared infrastructure and services with all emergency agencies. At the heart of this infrastructure is an IP based transport network and data and/or multiple data centers. The IP network is commonly referred to as an Emergency Services IP network (ESInet). In our model the data centers will reside in the ESInet, or interface with legacy call delivery network. We have labeled these centers Public Safety Operations Centers (PSOC) for the purpose of this discussion.

The PSOC will contain the Emergency Call Routing Function (ECRF)/Location-to-Service Translation server (LoST), the Emergency Service Routing Proxy (ESRP), a Conference Server for bridging multiple parties such as caller, call taker and dispatcher or responder onto a call, a media server for recording conversations and PSAP Director (PSAPd) for call routing within the PSAP, ACD functions, call logging and call details. The call taker will use a browser based graphical user interface (GUI) to interact with all types of emergency calls. The PSOC can contain any gateways necessary (LSRG or LNG) to convert a TDM call into an IP call.

Emergent's solution is uniquely positioned to benefit in this ESInet environment because of its SIP based open architecture, ability to handle multiple media types (voice, video, text and data), flexible graphical user interface, and adherence to NENA's i3 solution for NG 9-1-1.

Emergent's 9-1-1 patented software solution components

Emergent's 9-1-1 software solutions are designed according to recommendations and proposals by NENA for Next Generation 911 systems. The focus of the design is based on NENA i3 08-003 entitled “Detailed Functional and Interface Standards for the NENA i3 Solution”.

http://www.nena.org/?page=i3_Stage3

Components for Interoperability with NG 9-1-1 Networks

For Next Generation 9-1-1 compatibility Emergent provides the following software components

ESRP – Emergency Services Routing Proxy

ESRP is a fully i3 aligned proxy server capable of handling in excess of 2,000 calls per second. The ESRP provides an appropriate URN on a per call basis and queries the ECRF with it and a location object (PIDF-LO) to determine the next hop routing. The ESRP is a signaling proxy with media anchoring occurring further downstream at the PSAP call control server (PSAPd). The ESRP will always query the PRF (policy routing function, part of PSAPd) before initiating signaling to the next hop to ensure downstream system availability.

The functionality for routing the call is a highly customizable platform and can be adjusted in a variety of ways to provide the best possible outcome for all routine and call failure scenarios. A comprehensive set of rules can be constructed to account for all possible call situations.

The server implements all of the features and logging requirements as established in the NENA i3 detailed specifications.

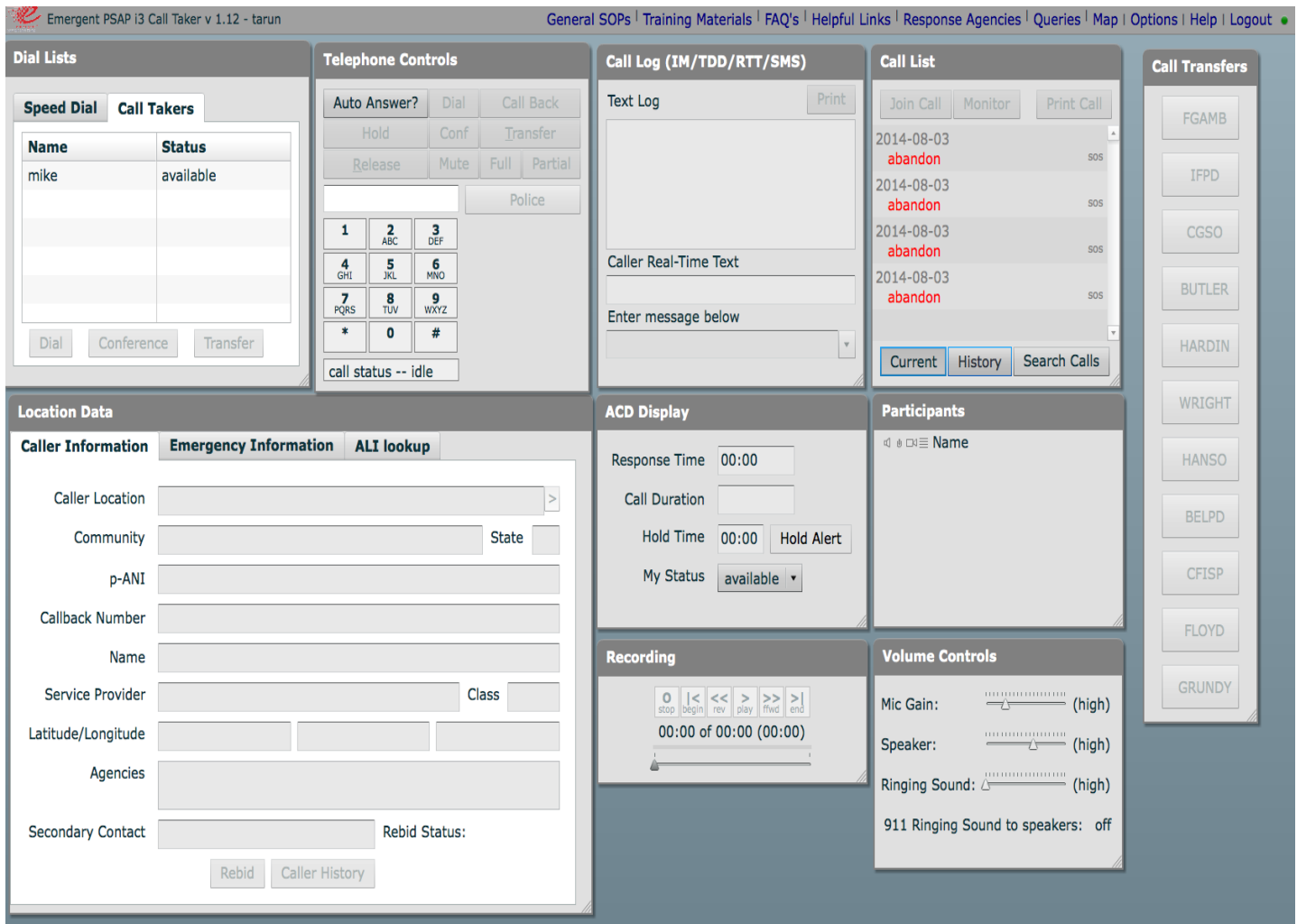
ECRF/LoST Server - Emergency Call Routing Function/Location to Service Translation server

The Emergent Communications ECRF/LoST is a fully IETF standards aligned and compliant LoST server capable of providing the i3 ECRF and LVF (location validation function) functions for any project.

The ECRF/LoST server is capable of multiple hierarchical roles within an NG9-1-1 environment and can be configured as resolver (recursive/iterative), forest guide (iterative) and authoritative server. The ECRF supports all projected geodetic types including circle, ellipse, arc-band, polygons and points.

Call Taker – web based software user interface for handling emergency calls

Emergent's call handling software **is the only stand-alone browser based call taker client on the market.** It is also the only multimedia call taker capable of receiving voice, streaming video and text calls (along with still imagery) in one unique graphical user interface i.e. no other application or client is needed to receive all future call types considered in the NENA i3 08-003 specification.



The call handling user environment is completely customizable and is set to establish profiles for each user to assure that their preferred changes to the screen “follow” them regardless of the terminal they sit at. All the call taker needs is an industry standard workstation and monitor(s) connected to the PSAP local area network (LAN).

PSAPd– Public Safety Answering Position director (PSAPd)

The intelligence for the call handling interface is provided by **PSAPd**. This SIP based system provides all the call control features that the PSAP requires. The combined PSAPd /calltaker platform offer includes, but are not limited to, these features:

- Call control
- Conferencing: multi-media capable for all notes, pictures or data from caller
- Transfers: multi-media functions as conferencing
- User defined functions (call lists, speed dials, etc)

Additionally, it is used to implement call transfers and can interact with the ECRF to obtain routing instructions. PSAPd is also the entity responsible for interacting with external information sources as necessary and therefore acts as a buffer between PSAP's and elements external to the ESInet.

Synopsis of Features of Emergent's 9-1-1 solution

The following is a synopsis of some of the key features of Emergent's 911 software solution

- Support for different media types (voice/video/text)
- Support for 911 calls and administrative line calls
- Speed Dial
- Audio and Visual Incoming Call Alert
- Distinctive Ring for different call types.
- Call conferencing with up to 6 participants. Call conferencing is possible between call takers at different PSAP's.
- Call Transfer. Call transfer also transfers location data. Call can be transferred to another call taker on the same PSAP, at a different PSAP or at a legacy PSAP.
- Callback to caller
- Location Support. Location of the caller is displayed to the call taker.
- Support for adding discrepancy to Location data.
- Support for adding notes/location to emergency calls.
- Display status of a call to all call takers (init/ringing/active/closed)
- Show list of abandoned, queued, active and closed calls.
- Call History
- Advanced call search
- Instant Call Retrieval
- Call Recording
- Call Queues
- Call Monitoring/Barge-in
- Support for automatic call distribution with different strategies, round robin/ring all/random/first come first served
- Support for call distribution among different PSAPs (within the ESInet) based on policy based routing rules using ESRP functionality.
- Display of participants for each call with ability to control audio for each participant from the user interface.
- Call Hold with call hold alert and display of call hold time. Ability to take a call off hold that has been put on hold by another call taker.
- Integration with CAD (Computer Aided Dispatch) systems
- Integration with third party mapping software
- Allow printing of call data and location data
- Manual/automatic ALI rebid
- Manual ALI query
- Support for TDD/TTY

Emergent software system design

Emergent's software system for running its 911 suite of applications has been designed to have a 99.999% uptime. It is also designed to be scalable. Scalability is achieved by adding processing resources as the system grows.

All of Emergent's 9-1-1 software suite runs on Redhat Enterprise Linux 6 based servers. Each physical server is virtualized into as many virtual machines as necessary to service the PSAP.