



## **The Emergency Call Tracking System: Making 9-1-1 Inroads in California**

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Over the last 15 years, 9-1-1 reporting systems have been evolving and dramatic improvements have been made with the advancement of technology. Direct Technology, a leading custom software development firm, has witnessed and contributed to this progression. The Roseville, California based group has developed a deep understanding of how to deploy and manage an extremely successful and dependable 9-1-1 reporting system. Through the extensive experience gained from working in the industry, Direct Technology has created an Emergency Call Tracking System (ECATS) which is being described as the first universal 9-1-1 reporting system to be watched and acquired.

Originally, the product was developed to solve a critical business need for the 9-1-1 Program Office in the State of California. The Program Office was seeking a product that could provide universal 9-1-1 Call Statistics Analysis across the entire State, regardless of the type of Customer Premise Equipment (CPE) installed at each Public Safety Answering Point (PSAP).

Direct Technology accepted the challenge to develop and deploy the first version of the software in late 1996. This application required the use of Direct Technology patent pending, “buffer boxes”, to intercept all 9-1-1 call data and combine it into one central system. Users of the system can then enter the ECaTS portal to access the data, in a topographical interface, and understand how the 911 system was working across the state.

ECaTS has been an overwhelming success, it was the first product to abstract the complexity of collecting, reporting and managing 9-1-1 Call Statistics from a variety of different CPE manufactures while providing a simple to use web portal to access all the information in one homogeneous format. The product has since been successfully deployed in a myriad of States and Counties. The latest version of the product embraces solid Business Intelligence and Collaboration features that are increasing the demand for the product across the industry.

**ECaTS REPORTING SYSTEM**

The ECaTS system was built on the concept of simplicity. Its reporting module, the heart of the application, provides the user with simple, three click reporting options. Authorized users are able to generate real-time (or near real-time depending on the implementation) by simply selecting the report, selecting the timeframe and PSAP (or collection of PSAPs) to be used in the report. The system then accesses the high-speed Microsoft SQL Enterprise Servers to render the report directly over the Internet using nothing more than an Internet browser.

One of the many benefits of the application is that authorized users can pull information from one PSAP, one County or the entire State with the same level of simplicity. The complexity of pulling information from different CPE manufacturers, installations or software versions located at each PSAP is completely eliminated by ECaTS. ECaTS is the only universal reporting product that is truly vendor independent. Regardless of the hardware manufacturer, the CPE agnostic reporting tool is able to read and report PSAP's statistics on any CPE equipment including, Plant/CML, Positron, Xtend, Zetron, 911 Inc. and Moducom products.

Many of the reports usually generated by State-level analyst and PSAP Managers tend to seek the same level of statistical data. Information such as Call Summary Reports, Number of Calls per Hour, Top 20 Busiest Hours, Call Duration and various other reports are easily accessible to the user upon system log-in. If the report contains data for multiple PSAPs, the information can all be aggregated into one individual report. For example, an authorized user could get a report of all the prepaid wireless card 911 calls made in the entire State or County with just three clicks of a button. Historical trending takes a whole new meaning when a user generates 9-1-1 Call Statistics for the entire State during an entire year, in less than five seconds, with just four clicks. With this information the Government agency is able to see the effectiveness of all the PSAP's in the entire state.

In addition to the Call Statistics Report usually found in 9-1-1 MIS packages, ECaTS brings a wide range of Management Reports. These types of reports specifically address the analytical requirements of PSAP, County and State Managers across the industry. Some management reports include:

**Trunk Group Utilization Report** – This report provides an in-depth analysis of call volume per trunk and trunk group. PSAP Managers and State/County coordinators can review and determine if PSAP trunks are being utilized at appropriate rates (for example: are they hunting correctly, are they reaching capacity resulting in possible busy signals, etc.)

**Speed of Answer Report** – This report provides a clear scorecard of PSAP answering performance while clearly isolating those PSAPs that meet the NENA 90/10 rule – 90% of the calls should be answered by each PSAP in 10 seconds or less.

**Daily and Monthly Outage** – These reports provide information regarding up-time and availability for data collection and ALI. This tool provides immediate escalation for PSAP/CPE down condition including escalation to the Telco if required.

**Redirected Wireless Calls** – This report provides a statistical analysis on all wireless tower faces whereas more than 75% of calls picked up by a particular wireless face are consistently being

transferred to another PSAP. This information is typically symptomatic of misrouted wireless calls. Getting these issues corrected can greatly improve PSAP efficiency and call taking results.

One of the most powerful aspects of the system is its ability to empower authorized users with the capability to generate any report, on the fly, with minimal computer skills. It is one system that manages, reports, and collects all the data with unified reporting and managed services. Information from the PSAPs is available in a very clean, universal reporting system which can be accessed at any time. The Ad-hoc reporting module provides an intuitive interface with check boxes and drop-down lists for generation of analytical reports directly out of the high-speed SQL databases. For example, a County Coordinator may want to analyze the impact of VOIP calls within their County. This report can simply be generated by selecting those fields that need to be included in the report, then selecting a date range and finally setting the ALI Class type to VOIP. The reader should note that all fields are drop downs populated only by valid choices existing in the database. If there were no calls of type "VOIP" for the selected county, this choice would simply not exist in the drop down list. This ensures that users are not confused by typical values, but are only presented with valid information that is pertinent to the specific data set they are working on.

Another example could be an in-depth analysis of Wireless Phase 2 calls. For instance, a State Analyst could ask the system to provide a listing of all Wireless Phase 2 calls that were abandoned for the entire State during the last 12 months. If the subset of data in the report was too large, the user may want to narrow down the list to those abandoned calls that were put on hold for a time greater than 5 seconds. Continuing the same analogy, the user could then narrow the report further for those calls that came in from Verizon Wireless or a Pre-paid Card Service Provider.

The flexibility that is provided with ECaTS is available with all PSAPs in the County or State regardless of the type of CPE installed at each PSAP. Abstracting this layer of hardware complexity with the flexibility of a powerful module such as the Ad-hoc reporting tool provides the user with the first and only open, universal system to retrieve 9-1-1 call statistic data available in the marketplace today.

Comparative data is available on all reports that reflect the call statistics for a single PSAP as well as automatically reflecting the averages for PSAP's of similar size and for PSAPS in the same county. In time, ECaTS will also automatically provide comparative data for the same PSAP from the previous year. Since all of the data associated with 9-1-1 calls within the state will be collected by a single system, calls can be tracked as they are transferred from one PSAP to another for investigation purposes. This feature was virtually impossible when working with two separate systems in the past.

## **ON-SITE DATA COLLECTION**

ECaTS collects Call Detail Record (CDR) information at each PSAP by connecting the CPE equipment to a custom built buffer box. This buffer box, called the Remote Data Distribution Module (RDDM) has specifically been built and uses customized software for the collection, compression and security of CDR data.

As 9-1-1 calls are completed, the local CPE equipment generates a CDR record and outputs this information using a serial or parallel port. Direct Technology's customized RDDM box connects to this output port and dynamically stores each and every CDR port entry and compresses it into a secure database running within the device. On a predetermined time frequency (anywhere from five to thirty minutes) the database is encrypted by the RDDM and the data is delivered to Direct Technology's Data Center for processing.

One of the many benefits that ECaTS offers which sets it apart from its competitors is its ability to perform trunk analysis without pulling stats from the selective router. There are several instances where trunks are busy and the person calling is pushed to a busy signal, this is due to the trunk reaching capacity. The ECaTS system will enable the person managing the PSAP's to know at any point, how quickly the trunk is reaching capacity. This will shift the PSAP managers to have a proactive approach and help eliminate callers from reaching a busy signal.

## **REMOTE DATA DISTRIBUTION MODULE**

The RDDM is the heart of the data collection architecture of ECaTS. Indeed, this portion of the application ensures that the data is collected the moment it becomes available, ensuring that all statistics are collected and stored immediately opens up the possibility for real-time reporting and business intelligence behind all 9-1-1 traffic for a State, County or PSAP.

Once the RDDM has secured the data in its internal storage module, it can deliver the data to Direct Technology's Data Center in many ways: Directly via private network (if available at the PSAP), directly to the Internet (if available at the PSAP) and using dial-up.

Direct Technology has developed a Zero Data Loss Model, a critical factor when providing any type of statistical and business intelligence services. All data center components of the solution are redundant and the intelligent RDDM boxes automatically perform diagnostic checks on a regular basis and send their health status back to the Data Center. The accuracy of our reports has helped PSAPs identify issues with other reporting and analysis tools, while validating and supporting their management needs.

Since its conception, ECaTS has been a full turnkey service that is continuously managed and supported by Direct Technology. ECaTS is delivered to PSAPs, Counties and States as a service with Direct Technology provided managed services, hosting and support for all pieces of the solution. ECaTS is hosted in our Tier-4, state-of-the-art, Data Center located in West Sacramento, California.

*Fred Michanie is the Founded of Direct Technology. See: [www.directtechnology.com](http://www.directtechnology.com)*