

# 911 Alert!

The UC San Diego Emergency Notification Alert System: Triton Alert

Submission for the 2017 Larry L. Sautter Award for Innovation in Information Technology

## Prepared by:

Jon Weirick, Application Developer  
Financial Information Systems, Information Technology Services  
University of California, San Diego  
[jweirick@ucsd.edu](mailto:jweirick@ucsd.edu)

## Project Team:

Allan Kim - Application Developer, Information Technology Services  
Ben Hodson - Software Quality Assurance, Information Technology Services  
Brian Macpherson - Community Safety, UC San Diego Police  
Dan Gough - Director Environment Health and Safety  
Dismal Abelman - Emergency Operations, Environment Health and Safety  
Donnamarie Smith - Senior Baseness Systems Analyst, Environment Health & Safety  
Garry Mac Pherson - Project Sponsor, Environment and Building Services  
Gregory Murphy - Community Safety, UC San Diego Police  
Jen Kramer - Technical Project Manager, Information Technology Services  
Jon Weirick - Application Developer, Information Technology Services  
Kevin Chou - Project Sponsor, Information Technology Services  
Matt Hussmann - Emergency Operations, Environment Health and Safety  
Mike Howell - Business Project Manager, Information Technology Services  
Roberto Meza - Community Safety, UC San Diego Police  
Roger Philips - Technical Lead, Information Technology Services

## Summary

Implemented in 2007, the Triton Alert Emergency notification system allows emergency and campus personnel to instantly send email, text, and voice message alerts to anyone with an account—students, staff, faculty, affiliates, and guests in the event of an emergency situation, such as a campus shooting.

This system performed well for many years, but in early 2016 we identified opportunities to improve Triton Alert Emergency. We initiated a project in May 2016 and delivered the enhanced system before the start of the 2016-17 academic year.

## Goals

### Public Safety

The overarching goal of this project was to improve public safety. The team was motivated by knowing that our work could save lives.

### Enforcement

Campus populations were not required to have an account in the first Triton Alert Emergency system. The accounts in the system often had a significant amount of missing data. The team realized we needed better data and to reach more people. We decided to require all students, staff, and faculty to have a Triton Alert Emergency account. This improved coverage and ensured they would receive alerts via email. Additional contact modes had to be provided if users did not opt-out of them.

### Data Ownership/System of Record

In the initial system an outside vendor captured and maintained account data. After our review, the team decided to collect and manage all account data, which would then be shared with the vendor to send notifications. This made UC San Diego the System of Record and the definitive source for user contact information. It also allowed us to capture usage metrics and sequestered the data solely for this use.

### Minimal Impact/Maximum Effect

We created a one page portal to minimize the impact on users when creating and managing accounts. Account setup captures required information. Once created, Triton Alert Emergency operates in the background, ready to notify users of emergencies.

### Flexibility

Although UC San Diego is on good terms with the outside vendor it employs to send emergency alerts, we acknowledged that our system design needed to be more flexible. We designed a modern modular architecture that could minimize or potentially eliminate the vendor's role.

### Risk Mitigation

A reliable, effective, and smoothly-operating system was paramount. We had no room for error with the system. To minimize risks, we established exhaustive plans and vigorously tested the system.

### Timeliness

In June 2016, early in our development, a fatal shooting incident occurred at UCLA. In light of this event, we stepped up our timeline and delivered two months prior to the start of the 2016-2017 academic year.

## Project Highlights

The enhanced Triton Alert Emergency notification system includes the original webpage explaining the system, a new portal that enforces user interaction with the SSO intercept, an ETL extract that queries the UC San Diego database and sends it to the third party vendor, and the third party vendor's systems that send alerts to the campus population via email, texts, and voice calls (see Figure 1). Each component was significantly changed, which required teamwork and tight coordination of development, testing, and migration tasks within an extremely short timeline. Decoupling data management from the third party vendor (see Figure 1) permitted flexibility in vendor selection.

Due to the short time to implement the updated system, we did not create a multi-campus solution. However, our modular architecture design pattern can be easily adopted by all campuses. In addition, while the portal itself and the data sync are not currently set up for multi-tenancy, a future project could centralize the system and reduce costs. Each UC campus could manage its own data and import that data into the UC San Diego feed to its third party vendor. Emergency notifications would be sent to populations based on campus affiliation.

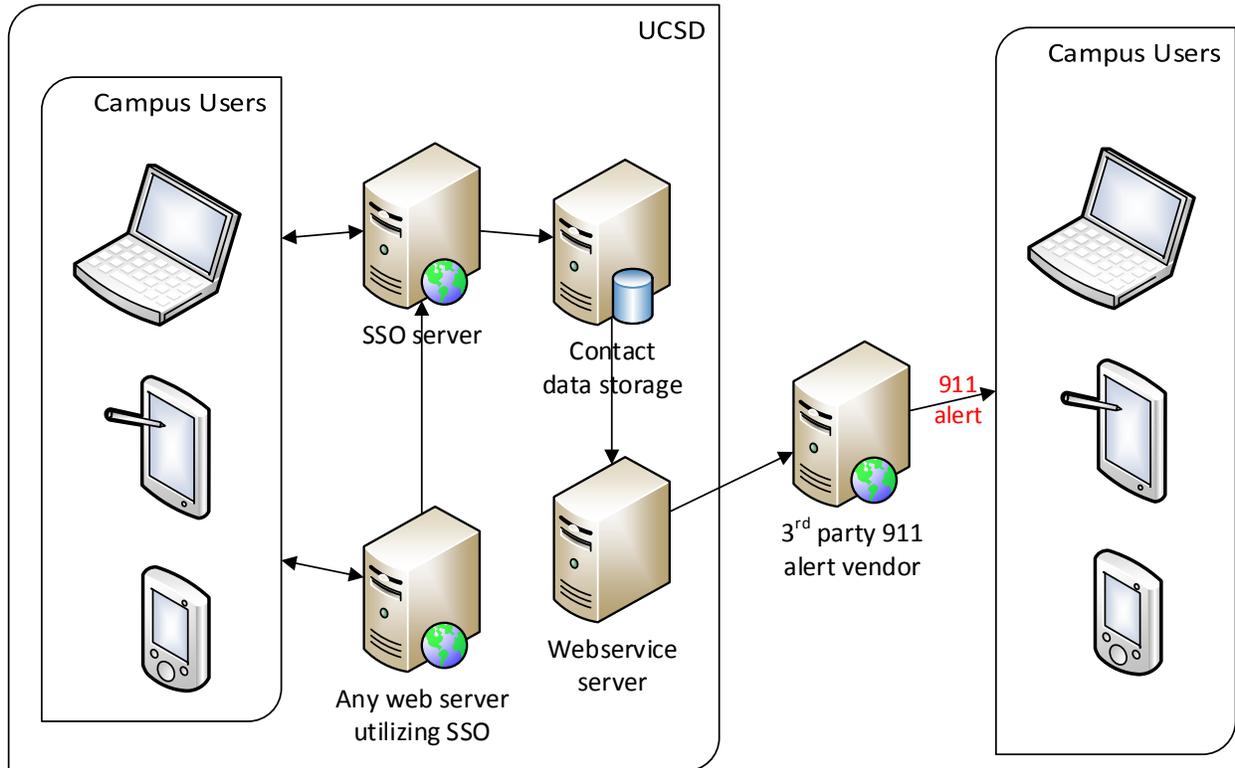


Figure 1. Improved Triton Alert architecture

Achieving the project’s goals required several key architectural points:

### Simple User Workflow

A single page, mobile-friendly portal allows users to easily manage their account. While notices via email are sent to everyone, users may enter one or two phone numbers in the portal or opt-out (see Figure 2). When entered, the portal accepts and validates international numbers. Users are responsible for any charges. Submissions are validated, permitting the entry of contact number(s) or opt-out, but not both. Once the page is successfully submitted, the user receives a success message and is able to use SSO.

**Email** jweirick@ucsd.edu

**Text/SMS** (201) 555-0123

**Voice** (201) 555-0123

Opt-out **By selecting to Opt-out, you will NOT receive emergency warning messages to your phone(s). Emergency messages WILL still be sent to your email.**

**Save**

Figure 2. Portal contact information submission page

### Opt-out

We determined that users should have the ability to decline to provide additional modes of contact (i.e. text, phone numbers). Campus email addresses were required as these are not considered private.

### Migration

We prepared campus prior to the change through timely and effective communications that stressed the importance of their participation. These communications set expectations for how to use the portal to add additional contact modes or opt-out of additional contact modes. We staggered these emails over a few weeks to prevent system overload. Upon migrating the system to Production, users who had not attended to their contact information were automatically sent to an enforcement page (Figure 3) when they attempted to login with Single-Sign-On (SSO).

### Enforcement

We used the SSO system to enforce participation, the first time SSO was used for such a purpose. Users who failed to submit either their contact information or opt-out were locked out of all campus systems that use SSO. This was a significant impact that emphasized the importance of Triton Alert Emergency. Locked out users are taken to a webpage informing them of how to clear the lockout (see Figure 3). Users must refresh their information annually. Users receive email notifications (sent in staggered sets) as reminders before lockouts. Users who enter their information before the lockout date do not experience a lockout.



**UC San Diego**  
SINGLE SIGN-ON

**Action Required**

You must verify your emergency contact information with UC San Diego's TritonAlert system to restore your access to Single Sign-On.

**Go to TritonAlert to review and update your information.**

UC San Diego policy requires all active students and employees to regularly update emergency contact information within Triton Alert. Please see [learn more about Triton Alert emergency notifications](#).

UC San Diego 9500 Gilman Dr. La Jolla, CA 92093 (858) 534-2230  
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**UC San Diego**

Figure 3. Enforcement page

### [Triton Alert Emergency FAQ and Help Pages](#)

We published a FAQ webpage to address common questions about the portal and overall system: <https://blink.ucsd.edu/safety/emergencies/campuswide/notifications/faq.html#What-is-the-Triton-Alert-system>

In addition, we tailored instructions to campus constituents (student, staff, faculty, affiliates, and guests): <https://blink.ucsd.edu/safety/emergencies/campuswide/notifications/index.html#Students,-academics-and-staff->

### [Results](#)

Tens of thousands of students, staff, faculty, affiliates, and guests entered their phone numbers or opted out within a few weeks of the enhanced system's launch. As of April 2017, 64,833 unique users entered contact numbers (text and/or voice). 12,390 users opted-out of the system.

### [Final Thoughts](#)

As I prepared this submission on Sunday, April 30<sup>th</sup>, I received an emergency message on my phone alerting me to a deadly mass shooting at a large apartment complex near UC San Diego that is home to many students. A person was killed and seven were injured. This underscores the importance of our work and this system.