

# Real-time Security Command and Control (RSC2)

## Introduction

The two stages of security, detection and notification of an event must be fully integrated and have status feedback across the network ecosystem. The level of integration and resilient communication determines how well the ecosystem functions.

Security systems today largely rely on motion sensor video detection and eyes on monitors. When widespread notification is required, aside from audible alarms, the industry uses cell phone technology and sometimes landlines. Cell phone networks and wireless networks in general rely on over-commit ratios. In other words, the local cell tower or Wi-Fi hotspots have a maximum user capacity, but usually operators allow cell tower subscriber-user ratio of 10/1 or more. In everyday operation, this makes sense as a cell phone customer can be registered with a cell tower, but not use its capacity. Not all users are using their phones at the same time. In an emergency however, the first thing that the general public does is communicate with their loved ones. When that happens, the local wireless infrastructure can become overloaded and crash, demand suddenly becomes way higher than cell or hotspot capacity.

Beyond connectivity issues, the use of cell phone applications or text messages to communicate also has limitations as, the user's phone or tablet must be switched-on, audible and nearby.

System integration and redundant notification are often an after-thought and commonly left to the customer's IT/Tech team to figure out.

Furthermore, little thought is given to provide customers with Command and Control (C2) of their properties that enables security staff to deliver situational awareness to first responders arriving on the scene.

## Real-time Security Command and Control (RSC2) concept

At its core, the RSC2 concept has a central backbone system allowing two-way communication between network equipment and the core on a dedicated Virtual Local Area Network for speed and redundancy. This two-way communication or feed-back loop gives operators instant situational awareness of a situation as it evolves.

The software used must have a small code footprint, to make it highly scalable and not affect network bandwidth. By its very nature an RSC2 solution should be edge intelligent and capable of integrating IP equipment across the network. The ecosystem should include audio and visual notification and allow for short messages to be distributed, qualifying the emergency notifications and reducing miss-understandings and unnecessary stress. The system should have a wireless redundancy capability. The detection and notification parts of the system must be integrated and work in unison in a completely programmable and totally customizable way.

## AI and IoT Harmony

Internet of Things (IoT) by its very nature delivers machines and equipment communication. The IoT hardware is generally small and low powered. The associated software utilizes very small data packages. This allows hundreds even thousands of devices to run on a network without clogging it and makes IoT devices on a given network, highly scalable. This therefore is the perfect notification mechanism to deliver the information generated by Artificial Intelligence (AI) detectors.

AI or Machine Learning is creating a new field in the video detection area where a system can analyze the images and determine with accuracy what it is "looking at". The AI's neural net is trained to replace eyes on monitors and detect independently. Different AI detection types include weapon, people, object and license plate detection. Once the detection is made, it can send the relevant information to a list of decision makers over its IoT real-time Security System to deliver critical information nearly instantaneously.

## Technology Considerations

The competitive environment in technology is driving important changes. At the same time the exponential growth of Open Source software is giving developers a huge boost in designing solutions.

IoT and AI are becoming household words while computing is getting even more size and power efficient with a competitive environment pushing costs lower.

Hardware is now designed to integrate many IP solutions, protocols and can sometimes control analog sensor equipment.

Micro-computers are readily available and make Edge Driven solutions and Edge Intelligence a reality.

## **RSC2 System Output**

The system is designed to communicate with hundreds or thousands of pieces of equipment at one time. It can inform building occupants of emergencies and let them acknowledge the situation. It lets people in any campus area or room declare an emergency or a medical alert. The operators can send short messages to occupants qualifying the situation and even giving the location of the developing emergency.

Both the detection and the notification are ultra-fast, every second counts in an emergency. If a detection is made, the system will snap images of the assailant for example and email them to a pre-determined distribution list. The system will follow the weapon from camera to camera and if the weapon is holstered, the system will follow the image of the attacker and place it on the floor plan of the building.

The system works with alerts lists, that can include parents without visitation rights, expelled students, sexual predators, known criminals, anything... Anyone. If an alerts list license plate is detected or a person on the list is detected, the image will be sent to the Security Administrator or a pre-programmed list by email or text message.

The system can provide police with instant notification to the dispatch center if so desired and will provide arriving first responders unparalleled situation awareness. First responders know who the assailant is and where their location on the campus; they know who is safe and who isn't and can deploy forces accordingly.

## **Applications**

The RSC2 concept was initially designed for schools to mitigate mass shooting attacks. However, its capabilities deliver a reasonably priced integrated, real-time security solution making it a great fit for many applications. Places of worship, universities, corporate offices, transportation hubs, banks, concert venues, shopping malls, movie theatres, supermarkets, anything... Anywhere.