

LEVERAGE Detect

LEVERAGE Detect is a powerful appliance that drives the LEVERAGE Video Management Suite (VMS). LEVERAGE Detect integrates all LEVERAGE VMS components and software modules together to provide the most sophisticated and flexible surveillance solution available on the market. LEVERAGE Detect executes the analytics for processing and viewing the video – and provides the ability to manage the surveillance nodes.

LEVERAGE Detect optionally provides automated incident recognition, notification and response. The powerful event-driven features enable Law Enforcement to effectively police areas even when officers are not present. LEVERAGE Detect event modules add an additional level of automation to any LEVERAGE VMS implementation. Integration with third party event software (i.e. gunshot detection or ALPR) will trigger the rotation and positioning of surveillance cameras to predetermined location settings (called presets) when predefined events occur

By adding LEVERAGE Detect event modules to the LEVERAGE VMS implementation, the expanded system becomes infinitely more powerful. The combined surveillance solution not only continuously monitors designated hotspot locations within a city; it also adds incident detection and location as well. Through LEVERAGE, Law Enforcement has increased its ability to maintain a safe community by utilizing technology as its force multiplier.

LEVERAGE Detect Incidents

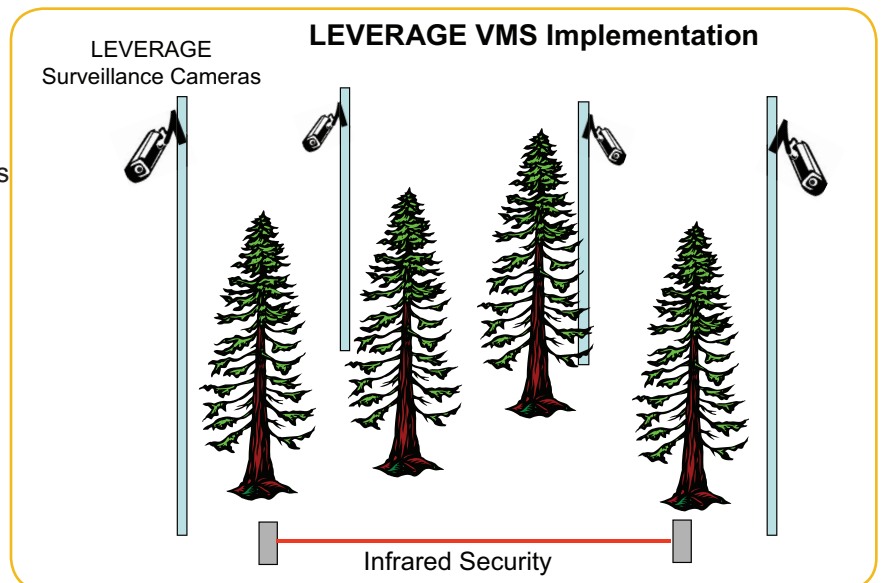
When incidents occur, the natural human response is to first gather sensory data (what happened and where did it happen). Then take into consideration an individual's overall knowledge and preparation for this incident type. Add to this the individual's ability to reason and set forth a proper protocol to respond appropriately. A critical factor that impacts an appropriate response is gathering key information in a timely manner.

Law Enforcement agencies focus on incident management. Officers respond to incidents of non-conformance and based on their training, knowledge, preparation and ability to reason, they set forth proper protocol to respond appropriately. But police officers cannot be everywhere at all times so what happens with non-conforming incidents when there is no one available to witness the event? The easy response is nothing. But the reality is that they continue to happen and because of this, the community's quality of life is undermined and therefore, becomes compromised.

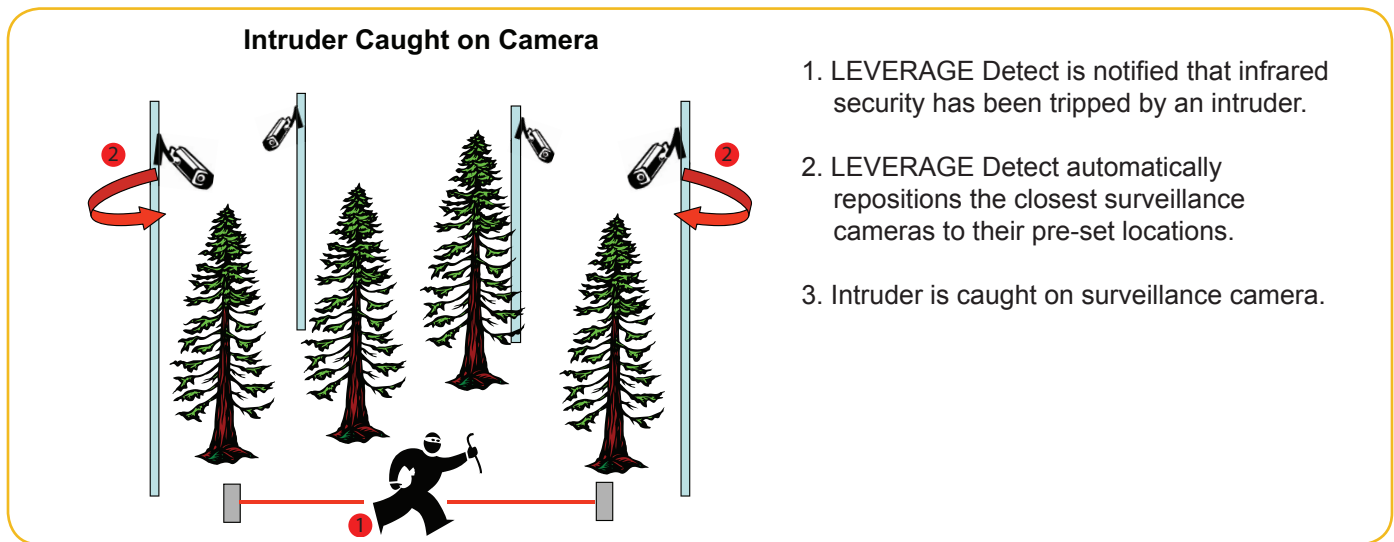
LEVERAGE Detect addresses the need for providing sufficient sensory data, in real time, in order to provide a timely response when no one is present to witness the incident. LEVERAGE Detect integrates with other systems (GPS, CAD, ALPR, Gun shot, etc) using an industry standard XML data exchange. LEVERAGE Detect then processes the incident and communicates with LEVERAGE VMS to manage camera positions based on the associated response rule definition.

When added to LEVERAGE VMS, LEVERAGE Detect capabilities emulate human intelligence gathering when non-conforming incidents happen and nobody is available to witness the event. And there is no limitation to the type and number of non-conforming incident definitions and responses that can be defined within the LEVERAGE Detect rules engine.

Consider the following example where an infrared perimeter security system has been installed in a city park area along with a series of four LEVERAGE VMS tactical surveillance cameras.



An incident definition (Detect Event) and response is added to the LEVERAGE Detect rules engine that will move the two closest surveillance cameras in the direction of a predetermined location (also called a preset) if the infrared beam is breached.



Adding Intelligence to Surveillance Systems

Until LEVERAGE VMS, surveillance implementations tended to be based on DVR or VCR technology and therefore, these systems were typically passive and fixed. And because the cameras were fixed, they were also limited in their ability to provide total holistic views of an incident. LEVERAGE Detect allows the individual responsible for monitoring the surveillance system to remotely move the Pan/Tilt/Zoom (PTZ) cameras into a direction that provides a full view of the incident. The ability to remotely control the cameras brings a level of intelligence to surveillance systems that before now, has never before been available.

The addition of LEVERAGE Detect event modules adds yet another added layer of intelligence to a surveillance system. When the LEVERAGE Detect event module recognizes an incident has occurred, it executes the behavior associated with the incident definition stored in the rules engine. This action request is sent to LEVERAGE Detect resulting in rotating the surveillance cameras to their preset definition. The automated camera behavior resulting from this communication is called "Intelligent Camera Response."

LEVERAGE Detect employs an additional concept for Intelligent Camera Response known as camera range or camera coverage. Each camera can be preconfigured to provide "Intelligent Views" based upon its range, which is strictly distance from the camera. Combining Intelligent Camera Response with Intelligent Views means cameras that are automatically positioned based on a predetermined response will never be out of focus.

LEVERAGE Detect Incident Types

Incident Types

LEVERAGE Detect supports two distinct types of incidents – predictable and random.

- **Predictable incidents** occur at known locations and/or they take place repetitively and therefore, can be managed by a predetermined response. Examples of this type of incident include trespassing and bank robbery.
- **Random incidents** are defined as unpredictable events that can occur anywhere within the city and at anytime. Examples of random incidents include 911 calls and gunshots – or responding to an Amber Alert situation. It is difficult to define a predetermined response in these cases due the lack of consistency with the incidents themselves.

Behavior Responses

Predictable Incident Behavior Responses

LEVERAGE Detect allows for preparation for potential criminal activity through an instantaneous response of camera resources. Consider an armed robbery at a convenience store in a downtown district. LEVERAGE Detect provides a predetermined response to this incident including but not limited to communicating with cameras located throughout the city and setting them to predetermined "views". Not only does this create instantaneous situation awareness, it provides post event video and information for forensic purposes.

The figure below illustrates a “GEO Space” Detect event. In general, a GEO Space is a term used in Spatial Analysis that refers to a defined area within a specified geography. In this example, A GEO Space was created at the intersection of Redlands Blvd and Orange Street. A GEO space is a polygon (triangular space) created by the LEVERAGE Detect Administrator. If a predefined event occurs within this GEO space, an audible alarm will immediately sound within dispatch. All cameras connected to this event will automatically rotate to the preset position that has been associated with the event. An alert event window will pop up on the monitoring screen that displays, in real time, what each camera is viewing and recording. Notice in this example the four cameras that are selected to automatically rotate and view the incident, and notice that they are also moved (pan, tilt, zoom) to a predetermined “Intelligent View.”



Simulated Detect Event

Detect events

- Geo Space Location is defined at the intersection of Redlands and Orange
- An event and behavior response is defined within the LEVERAGE Detect rules engine
- Four cameras are defined to respond to the event
 1. Oriental and Orange
 2. 6th and Redlands
 3. State and Orange
 4. Wachovia Bank

When event is triggered

- An alarm is sounded in the Command Center
- Four cameras automatically rotate to their preset location
- Alert window pops up on monitoring screen – displays camera’s real-time view of the incident

Dispatch is a critical function that has many important simultaneous tasks associated with it – such as viewing cameras, receiving 911 calls and communicating with officers in the field. Sounding an audible alarm and instantaneously popping camera views upon the screen during a predefined incident draws dispatch attention to the event immediately regardless of their current activity. LEVERAGE VMS combined with LEVERAGE Detect allows dispatch to operate at peak efficiency with all tasks at all times.

Random Incident Behavior Response

Since an incident happening in a random fashion is not predictable, the type of response is predicated upon nearby camera availability. The only information known about a random incident is type and location. Based on this it is important to learn more about the incident so that a proper response can be pursued. The initial response will be to bring any and all cameras located within range of the incident to the immediate attention of the Police Dispatching Center as a LEVERAGE Detect alarm condition. As the alarm in dispatch occurs, the cameras automatically rotate to provide dispatch an Intelligent View of the incident. To accomplish this, the PTZ (Pan, Tilt, and Zoom) cameras must be automatically and instantaneously positioned to provide an Intelligent View of the incident. Once accomplished, dispatch can now view the incident to determine proper response.

When Random Incidents Produce Predetermined Responses

Obviously, managing predictable incidents tends to be far more straightforward than handling random incidents. Because of GEO Space, LEVERAGE Detect can define and manage an area within a city in such a way that even random incidents can become predictable and therefore have a predetermined response.

Take the Amber Alert example previously discussed. As stated, because child abduction can happen virtually anywhere within a city, this type of incident is classified as random. However if this same city chose to place surveillance cameras equipped with Automatic License Plate Recognition (ALPR) at every city egress the incident can be altered from random to predictable. The random 911 call incident could trigger an intelligent response action that immediately and automatically turns the surveillance cameras located at city exits in the direction to monitor all vehicles leaving the city. The ALPR system would then read license plates of all exiting vehicles and compare the owner of record to names in the registered offender database for possible match.

Planning

As with any disaster preparedness exercise two objectives must be met. First, the desired result needs to be defined. Included is the need for defining the process flow needed to obtain the desired result needs to be worked through. We can define this response objective and process flow as a behavior response or scenario. Once defined within LEVERAGE Detect, behavior responses become automated and require far less human intervention.

An example of the process flow that could occur during a robbery is as follows:

- LEVERAGE Detect becomes aware of the incident. It then jumps into action based on the predefined process flow.
- Video cameras from inside the store are brought on line in dispatch to a predetermined monitor set aside for the downtown area stores.
- As this camera is brought on line, a pre-recorded message informs dispatch of the incident; the message may indicate the type of event, location, etc. In addition to the cameras inside, Street Level surveillance cameras are called into action.
- As many cameras as desired can be brought into this scenario.
- One camera at the nearby intersection zooms into the front door. Two other nearby cameras cover the building's egress locations. Three more locations cover main arteries leaving the city.

This process flow automatically executes within a split second.

The Watch Commander at Police Dispatch is the focal point during an incident. Planning for an incident includes the ability to provide streaming video to responding officers in their vehicles – without their intervention. The Watch Commander can see all of his patrol units on a map of the city through the LEVERAGE QuickView Pro application, which is available with LEVERAGE VMS. A simple click on a patrol unit allows the Watch Commander to send a video request to that unit. Since LEVERAGE VMS is a peer-to-peer architecture, it allows a patrol unit to receive streaming video from any camera on the system using QuickView MDC. The Watch Commander may send the store camera video to Patrol Unit #1, and send the building egress video stream requests to Patrol Unit #2 and #3. Units #4 and #5 are sent to City egress locations.

Imagine each potential source for an Incident requiring a specific system behavior, and most likely a specific human response. LEVERAGE VMS is a system wide intelligent IP Surveillance architecture that can instantaneously provide unique behavioral responses to specific incidents.

The second objective to preparing for an incident involves planning for those responsible to respond. Planning for an incident requires simulation. A LEVERAGE "Detect" event can be simulated involving first responders. The simulation undoubtedly will result in alterations to the response process flow so that it is air-tight when put into production. Planning in advance of an actual incident guarantees that proper response is obtained if it becomes needed.

Conclusion

LEVERAGE VMS is comprised of a patent-pending intelligent and robust IP Surveillance architecture. The product suite has been designed specifically to provide proactive incident response capabilities to Law Enforcement and Public Safety officials. In addition, LEVERAGE Detect is able to communicate with other systems (GPS, CAD, ALPR, Gun shot, etc) using an industry standard XML data exchange. Utilizing LEVERAGE's automated approach to incident management reduces the possibility for human error while improving response times and increasing Law Enforcement effectiveness.



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