

FAQ for the iVDO SmartEdge Video Surveillance Solution
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1. What is iVDO SmartEdge and how does it work?

The iVDO SmartEdge solution integrates a number of video surveillance elements into a cohesive system where innovative real-time video analysis is performed in the encoder at the network edge. When a security breach or event is identified, alarms, alerts, and video are sent to those responsible for responding to the event and to a video storage device for future viewing.

An iVDO SmartEdge module within the video management software allows the rules of analysis to be defined. Basic rules consist of area of interest monitoring, virtual fence crossing, sensitive area loitering, and object left behind and object removed from the area under surveillance. An iVDO SmartEdge feature within the iVDO IP encoder utilizes an embedded DSP chip to process video based on the defined rules and generates an alarm with a frame-capture of the rule being violated. Captured frames consist of frames before, during, and after the event to provide a complete picture of the situation.

2. What components make up a typical iVDO SmartEdge powered video surveillance system?

iVDO SmartEdge is a scalable system made up of the following commercially available components:

- CCTV cameras of various types
- Cornet Technology iVDO IP encoders
- Commercially available wireless/copper/fiber networking devices
- Cornet Technology's surveillance command center software, VDOScope®, where the iVDO SmartEdge surveillance rules are set, camera views and threat alerts are displayed, and video feeds are recorded.

The iVDO SmartEdge system can tie into existing physical security and fire alarm systems to provide a complete solution that gives operators varying degrees of control depending on the level of security breach.

3. How is iVDO SmartEdge different from other products on the market?

In a traditional video analytic solution, analysis is performed on a centralized server. Since analytics is a processor intensive application, it requires one application server for every four camera feeds to be analyzed! iVDO SmartEdge eliminates this costly IT infrastructure with its associated maintenance costs, by performing analysis continuously

at the edge. Video is sent only when a rule is broken or at lower frames rates for casual viewing.

With the traditional server based video analytics system, the network bandwidth requirements are enormous with a medium to large scale surveillance system. This often necessitates deploying a separate network exclusively for the surveillance system to avoid disruption of enterprise applications. Using SmartEdge the video need not be streamed to a central server as the analysis is performed right in the encoder. Only alarms can be transmitted which have extremely low bandwidth requirements.

4. What is an IP encoder? What are differentiating features of iVDO encoder?

An IP encoder is a device, which encodes and compresses an analog video feed and puts out an Internet Protocol (IP) stream. Once digitized this video stream can be distributed to different devices for display and viewing. An encoded stream can be displayed on a PC using a software decoder or can be displayed on a video wall using a hardware decoder to convert the digitized stream to analog.

Some of the differentiating features of Cornet Technology's iVDO encoder are –

- Standards based encoding technology (MPEG-2, MPEG-4 & H.264).
- Intelligent video analytics is embedded in a DSP on the encoder
- Performs the dual functions of streaming real-time encoded video while continuously performing video analysis in parallel
- Encoded video can be viewed using QuickTime, VLC or Cornet Technology's iVDO viewer.
- The iVDO encoder and decoder are temperature hardened (-40 to +74 C) to allow for use in outdoor/industrial environments
- The iVDO encoder provides serial ports to facilitate PTZ control, contact closure and other pass-through serial data applications
- Support for bi-directional audio
- No moving parts

5. Has the product been applied in other markets and with what success?

The underlying analytics technology has been deployed in critical infrastructure surveillance applications such as airports, seaports, border control, military installations, and for various homeland security projects. The goal of this technology is to detect threats with a high degree of confidence. Today almost all major new surveillance system installations involve components of video analytics to improve their effectiveness.

6. “At-the-edge technology”- what is that?

At-the-edge denotes the location of the analytics processing. Cornet Technology's iVDO SmartEdge embeds the analytics function in its IP encoder. The encoder is the device directly attached to the camera, which encodes and compresses analog video and is considered “at the edge” of the network. This approach allows for bandwidth

conservation as only alerts can be transmitted when a rule is violated; there is no need to send full-frame video to a server to perform the analytics. This greatly reduces the demands on the network as well as the IT server infrastructure reducing the system complexity and the overall cost of ownership.

7. Does the iVDO SmartEdge video surveillance system help us meet NERC CIP physical security compliance?

The physical security standards under NERC 1300 Critical Infrastructure Protection (CIP) are included in:

- CIP-004: Define and Document Personnel handling and training required to protect Critical Cyber Assets
- CIP 006: Define and document Physical Security Perimeters within which Critical Cyber Assets reside

iVDO SmartEdge video surveillance provides comprehensive coverage under CIP-004 & -006 to include penetration of operator-set perimeters, presence of foreign objects or removal of property in the perimeter, loitering in the premises by unauthorized personnel, tailgating at entrances, etc. Its at-the-edge processing assures that there are no latency issues, i.e., violations are immediately alarmed and presented.

8. We already have cameras installed at some facilities. Do we have to replace these cameras?

Existing cameras can be utilized depending on their location and field of view. We can conduct surveys to verify condition and location of the existing cameras and their suitability for use with iVDO SmartEdge. As a general rule of thumb, cameras installed over three to four years ago should be replaced to take advantage of the latest technological advances in optics and resolution.

9. We are planning to have a 24x7 manned control center. Why do we need the iVDO SmartEdge surveillance system?

Most control centers do not have enough monitors to display all video feeds all the time. In addition, the operators typically have neither the time to watch the feeds every second nor can they concentrate beyond a few minutes. As a result, it is entirely possible that critical violations occurring in the view of the cameras could be totally missed. The iVDO SmartEdge video surveillance system continuously analyzes video looks for violations. Even if the control center is manned 24x7, iVDO SmartEdge is an extremely vital operational tool for increasing the effectiveness of the surveillance system.

10. Can the iVDO SmartEdge system be applied at the power generation as well as remote substation facilities?

Yes, iVDO SmartEdge can be deployed seamlessly for power generation as well as remote substation facilities. iVDO SmartEdge enabled cameras can be installed in critical areas and at the periphery of the plants as well as at the substation sites. The

iVDO SmartEdge video surveillance solution is especially powerful for transmission and distribution substations as they are typically unmanned. Operators at the regional and central command centers will have identical remote view of all facilities with “common situational awareness”.

11. We have heard about such systems being deployed on server platforms. Is the iVDO SmartEdge system similar to that architecture?

With the iVDO SmartEdge video surveillance solution, real-time video analysis is performed in video encoders at the network edge. Thus, video is analyzed for any possible threat continuously. If no one is watching or recording the video, the video does not enter the network. This way network bandwidth is conserved and networking cost is considerably reduced. In the case of the server based architecture, all the video feeds have to be transported all the time to the control room where the servers are located.

Second major difference is that the central server based analysis typically requires one server for four cameras. In contrast, iVDO SmartEdge analytics takes place in the embedded DSP in the encoder, which drastically lowers the cost of the system.

Because of these two reasons, SmartEdge video analysis at the edge of the network is the only practical and effective video surveillance solution for large-scale infrastructure video system such as one involving electric utility facilities.

12. Can the iVDO SmartEdge system interface with other systems such as physical security, fire and burglar systems?

The iVDO SmartEdge system interfaces with other sensor systems at two levels. First, the iVDO encoder can transport serial data through dedicated serial ports (RS232/RS422/ RS485). This allows transport of serial data for different applications - PTZ control, integration with proximity card readers and other physical and fire security sensors.

At the next level Cornet Technology's VDOScope control center software can interface with either the physical/fire security devices or control platforms. VDOScope is the central piece, which receives iVDO SmartEdge alerts when an event (security breach) occurs. Based on the event, specified video actions such as start recording, commanding the encoder to go to full motion video, and move the adjacent camera to cover the alarm zone can be triggered. Additionally, alerts can be sent to other systems (physical/fire), email notification server, console alarms for operators, etc.

13. In the same vein, VDOScope can receive an alarm from a card access system server, fire alarms server or a gas sensor server and trigger video actions as described above.

iVDO SmartEdge system's most powerful feature set is its ability to be integrated into the overall surveillance architecture and cause instant and multiple automatic actions for timely response.

14. What is the iVDO SmartEdge solution's network requirement?

An iVDO SmartEdge powered iVDO video encoder is an “IP gateway” for video traffic. It takes in NTSC/PAL video from the camera, digitizes, compresses and packetizes it and produces a stream of IP packets. The video is then delivered to the IP network only if there is at least one operator who is viewing the video on the desktop or on a wall monitor or there is an NVR that is recording this camera. If none of the above is taking place, the video is not delivered to the IP network, thus conserving the network bandwidth. The advantage of the iVDO SmartEdge solution is that even if the video is not delivered via the network as nobody is taking interest in it, it is being analyzed all the time for any configured security violation. The mechanism that is regulating the IP video stream getting on the IP network is called IP multicasting. The result of utilizing this standard IP networking technology is that SmartEdge solution requires fairly low bandwidth even for a system with hundreds of cameras. We can assist you or we can engineer the network for you for effective video delivery.

15. If we have hundreds of cameras at one facility or across multiple facilities, do we need a large network bandwidth for the video traffic?

The iVDO SmartEdge powered video surveillance system employs IP networking and the VDOScope video management platform. The IP network provides a seamless connection across multiple facilities. As indicated above, the actual traffic on the network is governed by actual operator and recording activities. However VDOScope provides a number of features that reduce network bandwidth usage. Its user interface lets cameras be grouped and organized by individual location. With its user account permissioning feature, the system manager can restrict each operator’s access to cameras as necessary. Both taken together provide a multi-location system that is well organized among different operators and operator groups and utilizes the network bandwidth as needed.

16. How can the iVDO SmartEdge system connect with cameras at the far periphery of our facility?

The iVDO SmartEdge system utilizes IP networking protocols for video transfer. Any standard off-the-shelf wireless, fiber or copper networking device can be used to connect a distant camera to the network typically these cameras use one of many types of wireless technologies. We can assist you or we can engineer the network connectivity for all cameras.

17. What is the skill level of personnel who have to operate the iVDO SmartEdge system?

VDOScope’s Java-based graphical GUI provides the user interface for the iVDO SmartEdge video surveillance system. Most actions can be performed by clicks of the mouse. The user interface is designed with a goal to aid the operator efficiently perform his/ her activities. The skill level of the operator is expected to be that of a typical control room operator with some domain knowledge and familiarity with the utility operational objectives and organization. There is no special skill required to be an effective operator of the iVDO SmartEdge system.

18. Does iVDO SmartEdge system have proprietary interfaces that would make the system noncompliant with any open-standards directives?

In response to today's marketplace demands, the iVDO SmartEdge system is as open and standards-based as today's technology allows. It will meet open-standards directives of various organizations.

iVDO SmartEdge uses open video encoding standards, IP networking protocols, and COTS networking devices. VDOScope, a Java application, runs on Microsoft or Unix/Linux operating systems. The SmartEdge iVDO encoder with iVDO SmartEdge can be managed using Internet management standard SNMP or HTTP. The application-programming interface (API) for VDOScope is published so that it can be interfaced with a third-party control application platform.
