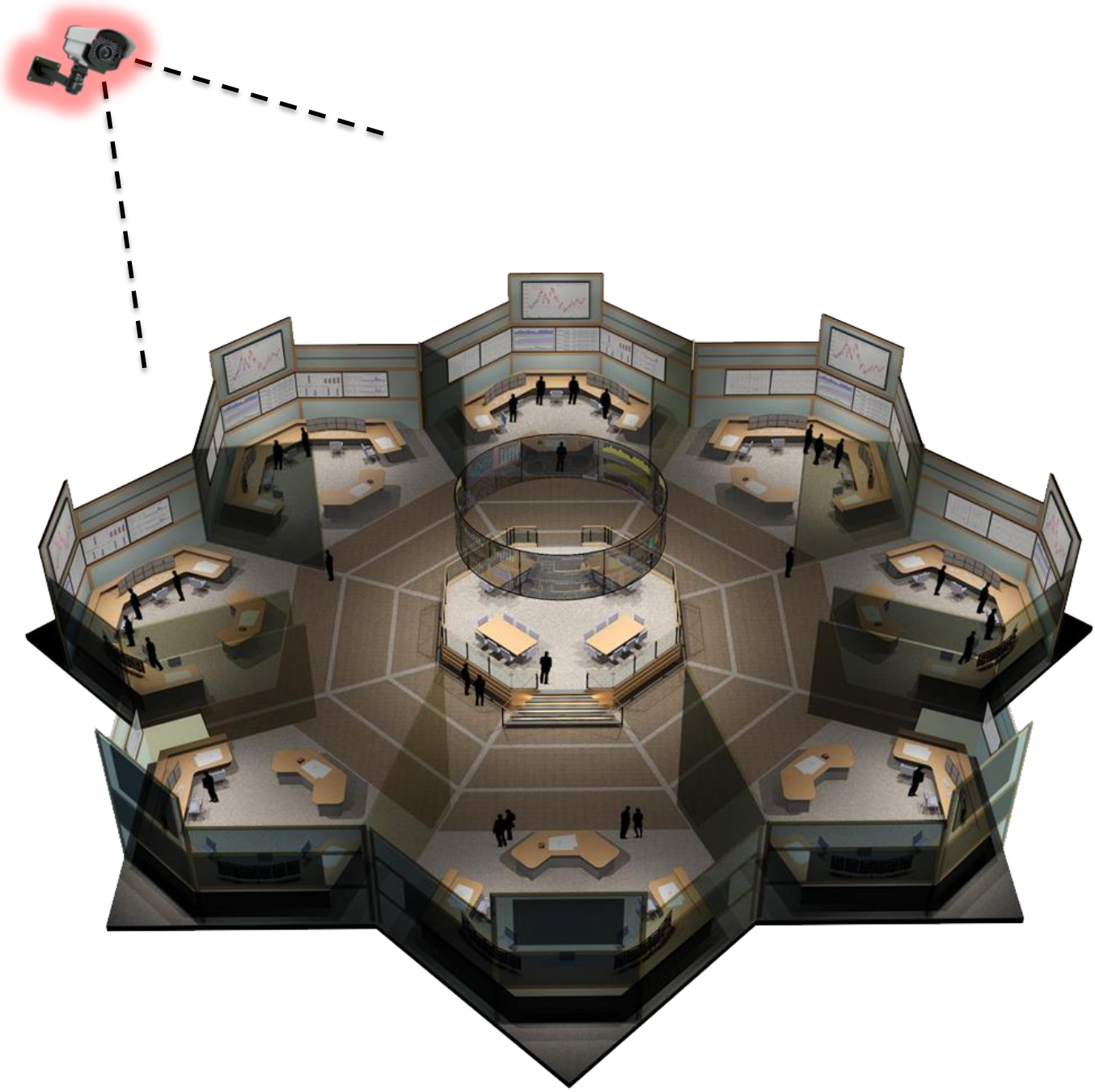
# i2V Systems

Intelligent and Integrated Video Solutions

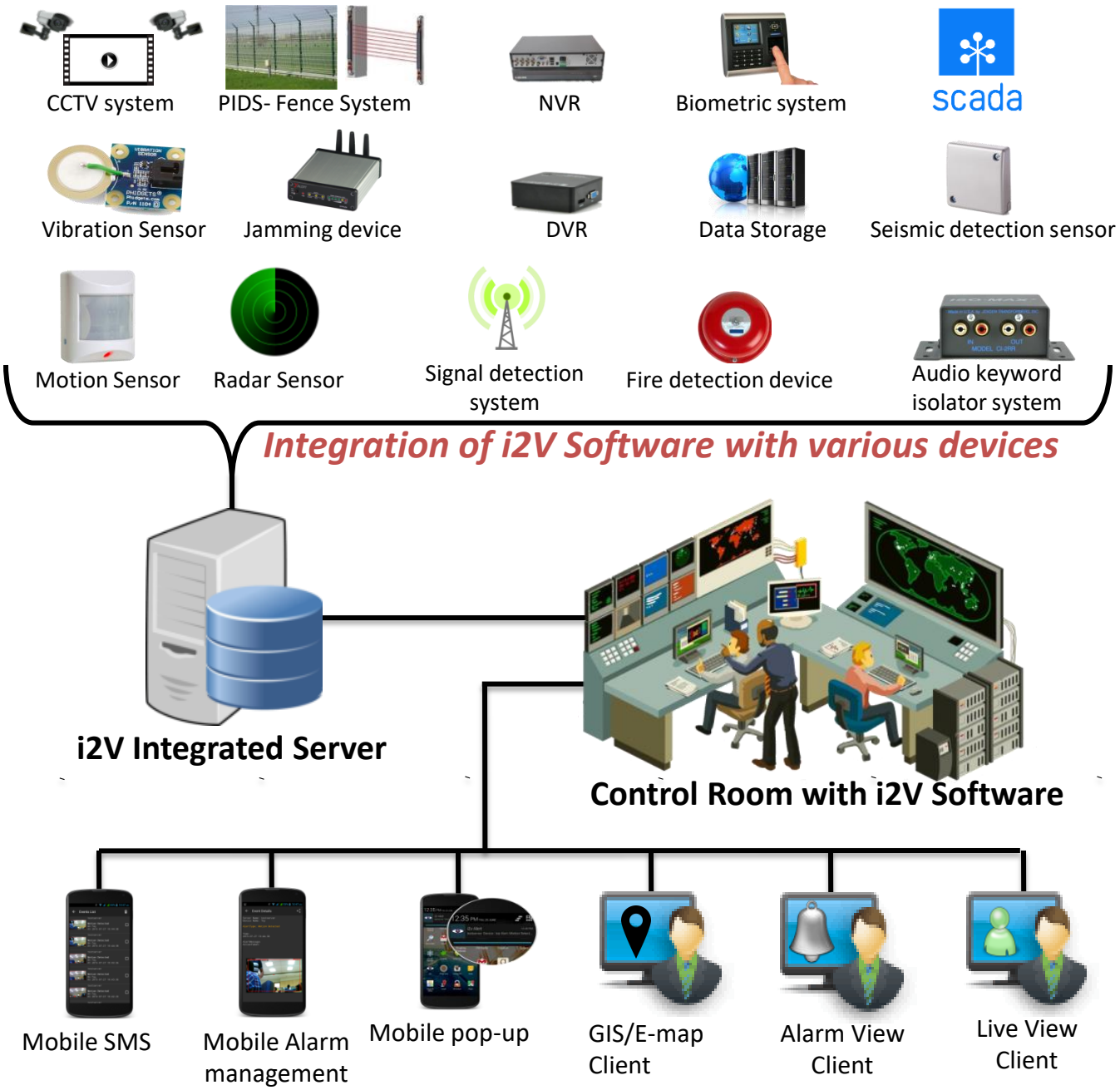
## Integrated Command and Control Center (ICCC/TCCC)



# Introduction – Integrated Command Center

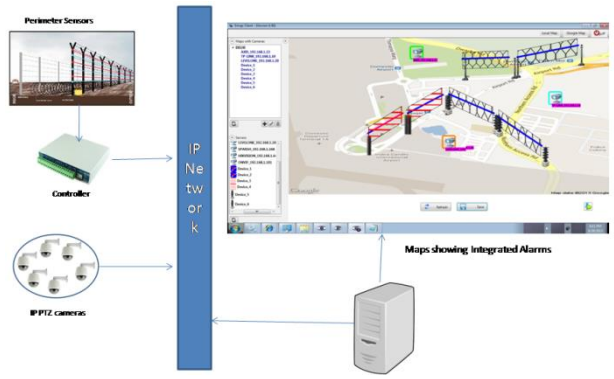
i2V Integrated Command Center Platform is an open architecture software that can integrate with most IP & Analog cameras, DVRs, NVRs, encoders, third party devices, sensors , PIDS, Fence systems, Radars, smart cities applications along with latest security technologies available in the market.

Through this software, a user can view, control, receive alerts & notifications from various devices anywhere in the system and take pro active decisions. The systems can connect unlimited number of surveillance systems and designed to regulate hundreds or thousands of security cameras and DVRs, NVRs, alarm devices, sensors and other third party devices.



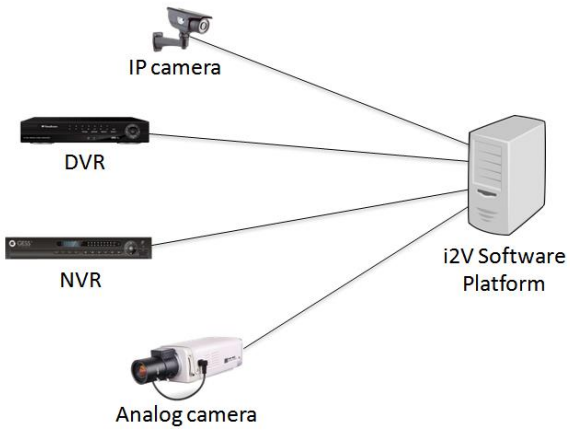
# i2V Platform integrating various third party devices

### 1. PIDS- Integration of Perimeter Intrustion detection system with Command & Control System:



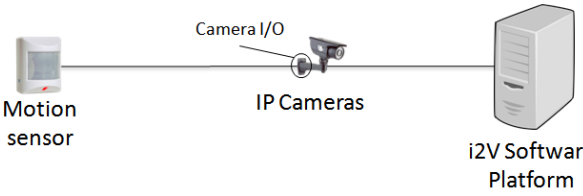

One of the finest examples of multiple integration is integration with Perimeter Intrusion Detection System. It includes integration of PIDS sensors with CCTV system. In case of any perimeter breach nearest camera should pop-up on operator screen. Moreover a PTZ camera should immediately be moved to a pre-defined preset showing the breach.

### 2. Integration through i2V VMS:



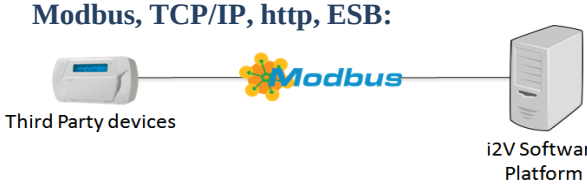

CCTV system comprises of **IP and Analog cameras, DVRs, NVRs, encoders** etc. Most of the camera and DVR brands are integrated with i2V VMS. The VMS support ONVIF, PSIA and RTSP protocol. The secure communication between ICCC and VMS software are available sothat Secured media stream requests shall be secured with strong certificate-based authentication. i2V VMS provides various Intelligent Video Analytics such as **Perimeter violation detection, Zone intrusion detection, Motion detection, Abandoned object detection, Stopped vehicle detection, camera tempering, Camera health status checkup, Alarm and Event Notification** etc.

### 3. Integration through camera I/O port:




IP cameras possess I/O alarm ports in it. These ports can be connected to sensors and devices like **Motion sensor, Push button sensor, Magnetic door sensor** etc. The alarms generated by these sensors can be noticed in form pop-up on i2V Software Platform.

### 4. Integration through defined protocols like Modbus, TCP/IP, http, ESB:




Those devices which support Modbus, ESB, http or https protocols can be integrated with i2V Platform directly. These devices can be **PIDS (Perimeter Intrusion Detection System), Control panels, fire alarms** etc. The alarms generated can be received on i2V Platform.

### 5. Integration through device SDK:


Some devices possess proprietary protocol and thus not available to integrate. Those type of devices can be integrate if SDK (Software Development Kit) or API of that device is provided. It includes devices such as **Jamming device, Fire alarm, Biometric sensor etc**. The alarms generated can be received on i2V Platform.

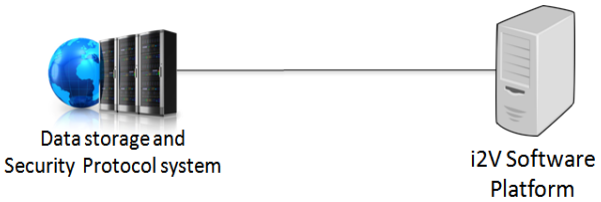
### 6. Integration through SCADA:


Devices like PLC system, industrial machines, generators and other electrical devices are connected to i2V command and control platform through SCADA API.

### 7. Integration of Various sensors:

The type of sensors required for various threat scenarios has to be analyzed after detail study of plants and industry by visiting the site.
Common sensors are Motion, Vibration, Magnetic, overflow, Fire etc.
This sensor has to be integrated with i2v control software for alarm and incident management.

### 8. Direct integration:




Direct integration of few devices like **Data storage system** etc can be done by making few changes in i2V software algorithm.

# Key Features of i2V Software Platform:

**1. Integration with GIS and Google Maps**

i. Different layers, Devices incidents, events zones, and Status in different colors, name can be monitored on customized(customer provided) GIS maps , Google Maps or popup windows.
ii. View/search devices name, live video, region, location vehicles, users based on their GPS coordinates, status or event triggered
iii. Continuously analyses information from various IOT sensors and data points assisting
iv. Supported file formats: PDF, JPG, PNG, Vector PDF Map, Web Map Service (WMS) defined by the Open Geospatial Consortium (OGC), Google Map –aerial; terrain, Bing Map, aerial, satellite, hybrid, ArcGIS/ESRI

**2. Define SOPs(Standard Operating Procedures)**

i. User can define SOPs for manual and automatic actions on real time data. Actions and SOPs can be defined with workflows and logical if-then-else conditions.
ii. Load documents, images or other files or forms as instructions and launch another SOP
iii. Action and activities can be added, modified, deleted , plans can be added as resources, documents and comments.

**3. Variety of Actions on events and incident**

Actions For example SMS, PHONE CALL, EMAIL, SOUND Alarm, PTZ movement, SNMP, Video POP up, Mobile Phone Push Notifications, SOP execution, Batch execution on web dashboard interface, mobile app etc.

**4. Incident Management and Escalation Matrix**

i. All events and alarms can be defined with escalation matrix. Acknowledge option is available or put an alarm to snooze, in-progress, pending list. For example In case of no response/acknowledgement from operator, immediate SMS to higher Authorities or if a device is not fixed for certain time alert higher authorities.
ii. Tool to instant communication between various user groups and authorities.
iii. Message prioritization feature.
iv. Customizable dashboard that provides real time status and is automatically updated when certain actions, incidents and resources have been assigned, pending, acknowledged, dispatched, implemented, and complete
v. Create and modify user-defined alarms by authorized user.
vi. Schedule Alarm
vii. Priority based Alarm with reactivation threshold.
viii. Alarm group by name. Type, source etc.
ix. Support Task Management.
x. Support Post incident analysis.

**5. Social Media Integration**

Software has the capability to extract automatic or user defined text information from Social Media (Twitter, Face book etc) relevant for Command and Control

**6. Immediate Video Verification of Alarm:**

By integrating Alarm System, sensors and CCTV system, SCADA System etc. an operator can have better video/audio view of the breach on each alarm or event in different color and choose proper response mechanism.

An operator can view both live and recorded video.

**7. Highly scalable module:**

i. Distributed Client server architecture based on standard TCP/IP, https protocol and use encryption with digital certificates for secure communication
ii. It has architecture to manage workflows by integrating information from different agencies and systems to facilitate responsive decision making in City/Industry scenario.
iii. Possible to combine the different views/dashboards onto a single screen or a multi-monitor workstation.
iv. ICCC combine data from different views and sources.

**8. Hardware Performance**

i. i2V, due to its advanced algorithm, consumes less hardware compare to other software.
ii. i2V application supports virtualization so easy to deploy at cloud or on premise environment
iii. Maximize real-time monitoring and control efficiency from one workstation through the synchronized control of high-resolution blueprints, images, streaming camera data, and system alerts which allows for interaction between all relevant data

**9. Web based open Software**

i2V ICCC/TCCC application works on web interface like chrome, Firefox, edge, safari. Due to its openness it is easy for operator to operate ICCC application with server ip with ports from any client system without installing any application. These ports (Ex:47060, 47061) are blocked for ICCC applications so that other applications can't use it and client system works with hassle free operations.

# Key Features of i2V Software Platform:

**10. Full CMS functionality with Quick views based on Grouping of branches, important cameras, users and resources**

i. An operator can easily view a set of resource , their status, alarms on different monitors by clicking quick launch combo boxes or selecting keys from keyboard.
ii. Troubleshooting utilities, import tools, and a unit discover tool available
iii. User based grouping, secure communication and authentication / authorization for devices and events
iv. Advance user management with description, roles and location
v. Single sign on feature
vi. Supports LDAP and PKI mechanism

**11. Failover/ Fault Tolerance**

i. Continuous database replication with primary and secondary server and protect against potential database server failure and continue to run through standard off-the-shelf solutions.
ii. Automatic ICCC/TCCC Application failover feature i.e if application stops working in primary server then ICCC/TCCC application will start working within 30-40 sec in secondary server
iii. Automatic real time update of TCCC application in the all active Clients after take over of the Fail-over server
iv. Automatic logging of operator actions or response mechanism.
v. Event notification of all Fail-over events in TCCC Server

**12. Customization and Integration with third party devices:**

i. i2V ICCC/TCCC software platform provide user friendly interface (UI) to present a Integrated interface for the management, configuration, monitoring, and reporting of various embedded systems.
ii. ICCC/TCCC software is fully customizable based on open source architecture, highly scalable to seamless integrate with various City-wide smart elements/applications like IP video management system (VMS), Video Analytics, IP automatic license plate recognition system (ALPR), Red Light Violation Detection (RLVD), Speed Violations Detection System (SVDS), Variable Message Display Sign boards (VMD), Emergency response system, Dial-100/108/112, PIS, Public Wi-Fi, ITMS, IOT Sensors, SCADA/EMS system, BMS Smart Parking System, Vehicle databases, fire alarm, access control, motion sensor, E-goverance services, IOT systems , GPS, GAS, Wind, Environment sensors, etc. through the SDK/API of the respective system under a single platform.
iii. SDK/API is available for integration with 3rd party devices

**13. Reporting, Charting and Other Important System Functionalities**

i. Support Big Data based Data Management platform
ii. and Manual logs/reports generation of integrated system in chart, tabular format of system status, events, incidents, print and export report in pdf, excel, csv or html formats, automatic email on predefined recipients daily, monthly or schedule basis.
iii. Report of all SOP/workflows executed, created or modified in the application.
iv. Option to use filter and generate reports of various integrated system for example Video Analytics event report, ANPR report, Traffic congestion report, System/Device Health status report etc.
v. Pre-defined templates and custom templates are available with different filters, report lengths, columns, time span period
vi. Filter details based on location, name, brand, reports, entity type, event type, event timestamp, custom fields etc.
vii. Click on an entity within an existing report to generate additional reports from the Monitoring UI. For example click device health status report and all devices report will be open in different dashboards UI.
viii. Support KPI indicators helps in managing the security incidents, application/devices health status across the locations.
ix. View and track audit trails that show a history of user/administrator changes, logs of operator/administrator additions, deletions, and modifications.
x. Digital Evidence Management for storing critical events and incidences (evidence documents, video clips, audio clips )with provision for longterm tamper-proof data preservation

# Central & Integrated Command Control software Specifications:

## 1. Command and control Highlights

a. Centralized command and control and Video monitoring of Unlimited cameras , third party security devices spread across multiple sites, towns or places
b. Scalable distributed network architecture allow multiple connection between serve and clients.
c. Connection to Multiple monitors for Alarm, Maps screens and Live videos(Fixed and PTZ)
d. Situation Management by defining appropriate actions, messages, and acknowledgement for alerts & events from various devices.
e. Simple and user friendly GUI based dashboard supports all browsers, mobiles, OS platform
f. High Definition video without data loss.
g. Fault Tolerance and Failover feature
h. Database backup/restore option available
i. Forward alarms to other users in the system.
j. Multiple hierarchy GIS, E-maps showing status and alarms of all cameras & devices.
k. Alarm reports including device connect and disconnect Status reports.
l. Ability to save/edit real-time events/alarm
m. Manually and Automatic Trigger alarms.
n. Video Analytics alerts: Camera Tampering, Intrusion , Missing object, Perimeter Violation, Object Left, Crowd Detection, Stopped Vehicle, Illegal Parking etc.
o. ITIL standard implements for SOPs
p. SDK/API is available
q. ICCC support data representation & exchange, aggregation, virtualization and flexibility.
r. Support Multi displays configuration
s. Support Rule engine & optimization.

## 2. Device and Third party application Integration

a. All the alarms can be shown in same system. Ability to integrate with devices by either sending events from VMS or receiving events from other devices. Event SDK support required from VMS. Events from VMS and Video Analytics should be able integrate with third party applications.
b. Supports integration with external devices like cameras, PTZ cameras , sensors, Video Analytics, BMS, Smart Parking, Public Wi-Fi, Variable Message Board, E-Goverance services, Scada utilities, Access Control, Intrusion Panels, ANPR, Dial 100 and PIDS(Perimeter Intrusion Detection System),, Intrusion panel and other similar IP/non-IP based third party devices (e.g. open source intelligence, situation management war room, etc
c. Can configured on cloud platform
d. Reports of data received from third party device can be generated on hourly , daily weekly or monthly basis
e. Software is not be restricted by license terms based on hardware & devices.
f. Option to integrate in existing solution using SDK/ API.
g. Option to integrate field devices that supports/enabled by IoT protocols such as OPC UA , MQTT, AMQP, ZigBee LoRaWAN etc.

## 3. Central Monitoring System Specifications

a. Centralized monitoring of Unlimited devices spread across multiple branches and cities
b. Customization the settings of devices from i2v system
c. Simple and easy GUI based dashboard
d. Local recording at branch with High Quality Video and Low bandwidth streaming to Central station.
e. Groupings based on Branch, City, State, Country, Sensitive, Important branches.
f. Alerts in central station according to rules.- Email, SMS, Sound alert and Video Pop-up.
g. Option for Video Analytics alerts: Camera Tampering, Intrusion in branch, Missing object, Perimeter Violation, Image Enhancement.
h. Situation Management by defining appropriate actions and acknowledgement for alerts
i. Emap/GIS Maps showing status of all devices and alerts- camera alarm, Connect and Disconnect Status.
j. Camera Sequencing : Select cameras and time interval Option to view camera from server or directly.
k. Alarm and Device status reports on hourly , daily weekly or monthly basis
l. Enable system and cross system analytics through city platform in order to make city operations intelligent.

## 4. Google/GIS Maps (E-Maps)

a. Import/Export of maps supporting all standard image formats i.e. file types GIS, JPG, PNG, GIF, BMP
b. Supports Google Maps for location search and saving the map image
c. Unlimited level of linking of maps in hierarchical tree manner
d. Full screen map interface
e. Easy interface via Drag and Drop of the devices on to the map
f. Device blinking in case of event detection alerts passed
g. Customize the icons of any entities represented on the map and monitor the state of entities on map.
h. Any time Live view display of the camera video with just a mouse click of the Camera icon on Emaps, zoom-in and zoom-out on the region of map.
i. Customized icons with PTZ controls on map, Spanning the map over multiple screen
j. Ability to display information in layer ex: Base layer, overlay layer and KML formats.
k. Support all GIS / Geo-spatial standards
l. Click, Select and Control the integrated application(VMD, ECB, Diial-100, VMS, sensors, Street lights etc.) from Single platform in TCCC.
m. Data analysis on the data received from various traffic sensors, iot sensor, integrated systems and providing the operators an ease to use platform

## 6. Multiple Remote Viewing

a. Supports multiple sites spread across WAN to be controlled and viewed from central location.
b. Option of redundant/backup recording at remote site through "ftp" protocol.
c. Intelligent Search based on Date/Time/Camera, Name, ID, Location etc. for more than one device simultaneously
d. Remote Administration over internet.

## 7. System Health Report

a. Automatic Health check up and activation of optimization modules once CPU reached more than 85%.
b. Complete server logs including login access, system settings change, archiving events, video or recording loss and all activity done by administrator or any other user in the system.

## 7. User Management

a. Defining users with their details and roles: Administrator, Viewer based on Configuration Settings, Priority based, scheduled based etc.
b. Allow the administrator r users with appropriate privileges to change the system configuration.
c. Customizable user interface for Configuration of various 3rd party devices, resources and device/resource mapping Camera or camera groups assignment to users
d. Central user management of the ICCC users, user groups and other Access control groups
e. Encrypted Password Authentication at local/remote login over LAN, WAN, Internet
f. Dual Password Authentication using Access control integration, Mobile OTP etc. at client and server system
g. Assign permissions to multiple user with single click
h. Onscreen instructions and help menu is available
i. Provide Single-Sign-On permission on authorized users.

## 8. Mobile Application

a. Support mobile apps for on various andriod/ios smartphones and tablets
b. Secure communication between Command control server and mobile application over WAN, Wifi or mobile network connection.
c. Access the application based on username and password provided by authorities of corporation
d. Mobile App support for multiple sites spread across LAN/WAN/INTERNET
e. Operator at central control can forward the event to field person to verify the status and field person can acknowledge the event, and submit their response in form snapshot, audio, video file event through mobile app.
f. Received alerts on mobile on GIS MAP and manual verification by viewing videos.

## 9. Live and Alarm Monitoring

a. Live View possible for minimum 64 cameras simultaneously or matrix views..
b. View/Import/Export snapshots of each video and events.
c. Support ptz controls and virtual gourd tour.
d. View Live or recorded video from resizable and movable windows.
e. Support live view, playback , Alarm management options.
f. Support camera sequence with user driven
g. Support time synchronization.
h. Ability to create exceptions.


**i2V Systems Pvt. Ltd.**

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