6SSIVA®
Vehicle Detection

milestone

GOLD TECHNOLOGY PARTNER

6SS IVA®-Vehicle Detection was developed to automate Vehicle Surveillance which is becoming more and more critical with each passing day. It enables the detection of Vehicle during day or night, in good or average visibility conditions, with an outstanding accuracy and a very fast processing speed. It can be used in multi-purpose applications, involving public and private roads monitoring, parking lots surveillance, and many more. 6SS IVA®-Vehicle Detection is fully integrated with all Milestone XProtect versions where all the details including Vehicle recordings, Reports and Statistics will be accessed directly from the Smart Client interface.

IVA DATA FLOW

1. The Management Client IVA plugin allows the user to create VPS hardware, configure and send the IVA configuration parameters to the Ubuntu Server.
2. The Ubuntu server receives video stream from the recording server via VPS hardware and processes the stream.
3. The Ubuntu server sends the resulting metadata in ONVIF XML format to the recording server, which will be used to display bounding boxes on the Live View of the cameras. The Ubuntu server also sends detected objects data to the IVA web service which is installed alongside the IVA plugin on the Management Client.
4. The IVA web service stores the data in the IVA database on the SQL server.
5. The IVA plugin on the Smart Client reads the data from the SQL server and displays it to the user, along with the corresponding video playback.
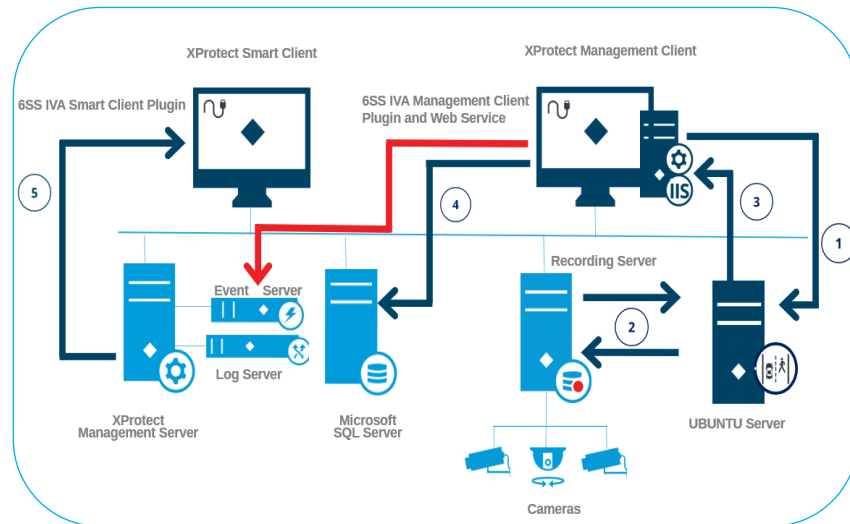
* *The IVA web service can send alarms to the Event Server, which will be displayed in the Smart Client Alarm Manager tab.*

Figure 1 System Architecture

Functionality

The two main components of the system, which is based on Milestone VPS Toolkit, are the 6SS IVA Management Client plugin and the pipeline server. Each system will have a 6SS IVA® management client plugin, and one Ubuntu-based Pipeline Server. These two applications can be installed on the same physical server if needed; in that case, the physical machine needs to be Ubuntu-based and GPU-enabled, with a Windows server virtual machine installed on the physical machine.

The Recording Server sends video streams from the cameras, through dedicated VPS hardware, to the Pipeline Server which will be listening to all incoming streams and performing Vehicle detection. All the results will be sent back to a dedicated web service on the Management Client machine and displayed in the 6SS IVA Smart Client plugin. Information about detected Vehicle is stored in the database, triggering alarms depending on the configuration.

Main Benefits

- Cost effective
- Easy to use and configure
- Fast processing speed
- Automation of Vehicle surveillance
- High accuracy
- Increased security and safety
- Centralized monitoring through the smart client
- Multiple applications and use cases
- Development team is always available to add custom-tailored features in case needed.

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Key Features

- Configurable from Milestone Management Client.
- Fully integrated with Milestone Central Search feature for XProtect 2020 R1 and above (works with all models and modules).
- Accessed from the Smart Client interface.
- Compatible with MJPEG and H264 video streams.
- Can handle many fields of view, from close-up footage, to higher up, far range footage.
- High detection accuracy.
- Multiple secondary detection & classification models and logic-based modules could be applied on top of the detected Vehicle (vehicle color model, make model, type model, wrong way detection, illegal turn module, vehicle speed, stationary vehicle, congestion detection.)
- Search functionality with filters for all the models and modules.
- Option to view a playback video for the period when the vehicle was detected.
- Customizable dashboards and statistics.
- Alarms depending on configuration.
- One-click data export in Excel and PDF format.
- Easy operation.
- List of all detected vehicles, including their features (depending on the activated secondary models & modules)
- Customizable upon request.

Applications

- Surveillance of private and public roads
- Security monitoring of parking lots
- Monitoring unusual vehicles behavior (e.g., wrong way, illegal turns, stationary vehicles)
- Collection of statistics regarding vehicles visiting a road or venue (vehicle type, make & color)
- Ensuring speeding laws are followed
- Monitoring roads for traffic jams.

System Components

Management Server:
- Microsoft SQL Server Express, Standard or Enterprise edition Milestone XProtect Corporate, XProtect Expert, XProtect Professional+, XProtect Express+, or XProtect Essential+ 2020 R1 & above
- 6SS IVA® VPS Management Client Plugin for XProtect 2020 R1 & above
- 6SS IVA® Complement add-on for the Milestone Central Search 2020 R1 & above
- 6SS IVA® Smart Client Plugin for XProtect 2020 R1 & above

Pipeline Server:
- Ubuntu 20.04
- CUDA
- Docker, NVIDIA-Docker
- NVIDIA Driver
- 6SS IVA® pipeline Docker container

Minimum System Requirements

Pipeline Server
- Central Processing Unit (CPU):
  o 2 GHz or better processor with 8 processors
  o x64 (64-bit)
- Graphical Processing Unit (GPU):
  o 10GB for 8 streams
- Random Access Memory (RAM):
  o At least 8 GB of RAM

Management Server:
- Central Processing Unit (CPU):
  o 2 GHz or better processor with 8 processors – x64 (64-bit)
- Random Access Memory (RAM):
  o At least 8 GB of RAM

Business Value

Keeping track of crowd movement and access is much more effective with the use of an automated Computer software. 6SS IVA®-Vehicle Detection can be used in all applications where automatic detection of vehicle is needed especially surveillance, security, and access control. Using this application will assist in reducing the time and manpower needed for manual monitoring which will lead to higher security, increased revenue and benefits, and decreased labor cost.