Empowering Human Capability Through Real-Time Behavioural Insights

iSENTRY IS A VIDEO ANALYSIS MECHANISM, FOCUSSING ON THE ENHANCEMENT OF THE HUMAN OPERATOR'S ABILITY TO EFFECTIVELY MANAGE HUGE AMOUNTS OF LIVE VIDEO IN REAL TIME.

Core Capabilities

UNIQUE ANALYTICS

Core Analytics

Unusual Behaviour

Unusual Behaviour detection is driven by an unsupervised Artificial Intelligence platform. Pixel-based analysis allows the system to learn how objects normally move in an environment, and after a norm is established for a scene, the system will then create an alert on any deviations. Typically, live video, that needs to be analysed by an operator is reduced by 95% - 98%. The applications for Unusual Behaviour analysis are vast and will create insight for structured and very unstructured environments.

Target Ranking And Extraction

TREX is underpinned by a dynamic AI based learning process, creating the ability to acquire and track items of interest while ignoring environmental factors inherent to real world cameras like varied light conditions and even camera noise.

DeFence

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Left Object Detection

Left Object Detection will create an alert when an object enters a scene and remains stationary for more than a predefined amount of time. Additionally, the reverse of this feature, if an object is removed from a scene the system can also create an alert.

Video Tripwire (Indoor)

For sterile environments or specific areas of a video scene, iSentry has easy-to-use, multi-directional video tripwires to alert on all moving objects within the specified area.

RELIABLE INFORMATION

Data Enrichment

Applying the latest in Deep Learning technologies, the iSentry system can provide enrichment and thereby insight into alerts generated by its core analytics. The Deep Learning engine can recognise multiple classes of object, even at challenging camera angles and longer distances. The system is constantly improved and updated with training for specialist areas like age and gender estimation, fire and helmet detection as well as mask compliance detection.

VIRTUAL OPERATION

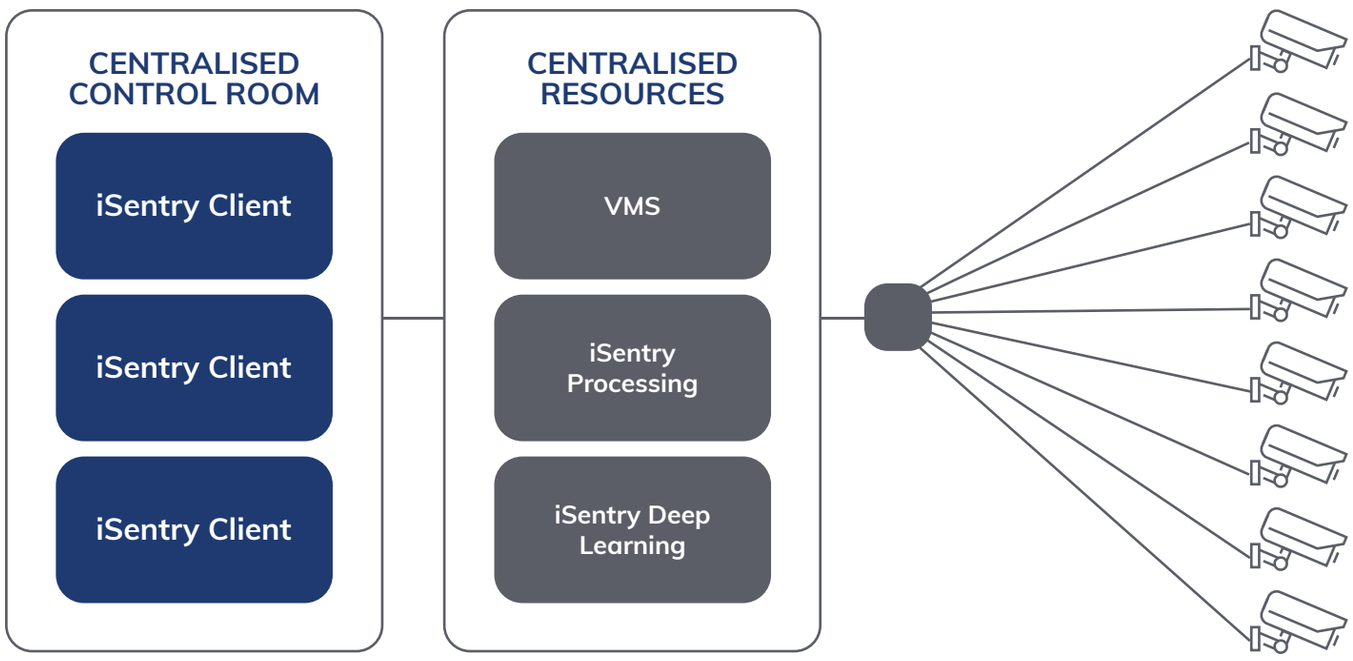
Automation

The iSentry logic engine plays the role of an operator, and as such can autonomously decide if an alert should be forwarded as an alarm or dismissed. This decision is based of factors like, the numbers and combinations of object types triggering the alert, the time of day and size of the object, or even the likelihood of accurate classifications. Typically, up to 80% of alerts can be processed by the system with no human intervention necessary. The inherent risk of automation is largely mitigated by several logic mechanisms including targeted rules, where rules are only applied where their outcomes are highly certain. Key to the iSentry philosophy, all alerts that fail the automation test, will be placed in front of an operator for further investigation.

Flexible Architectures

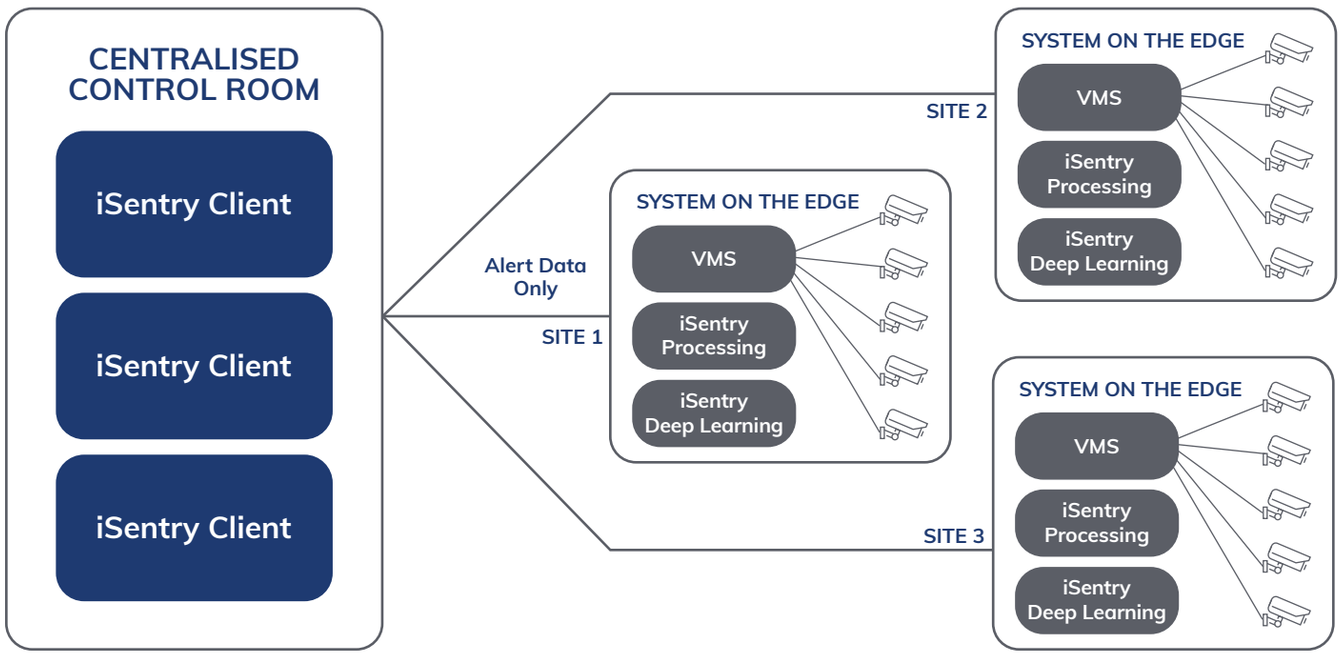
CENTRALISED ARCHITECTURE

This is the most commonly used architecture for small to very large systems. The iSentry centralised architecture has the advantage of relatively low complexity and can leverage economies of scale but in the case of a distributed camera network, may require significant bandwidth and add networking complexity for video feed centralisation.



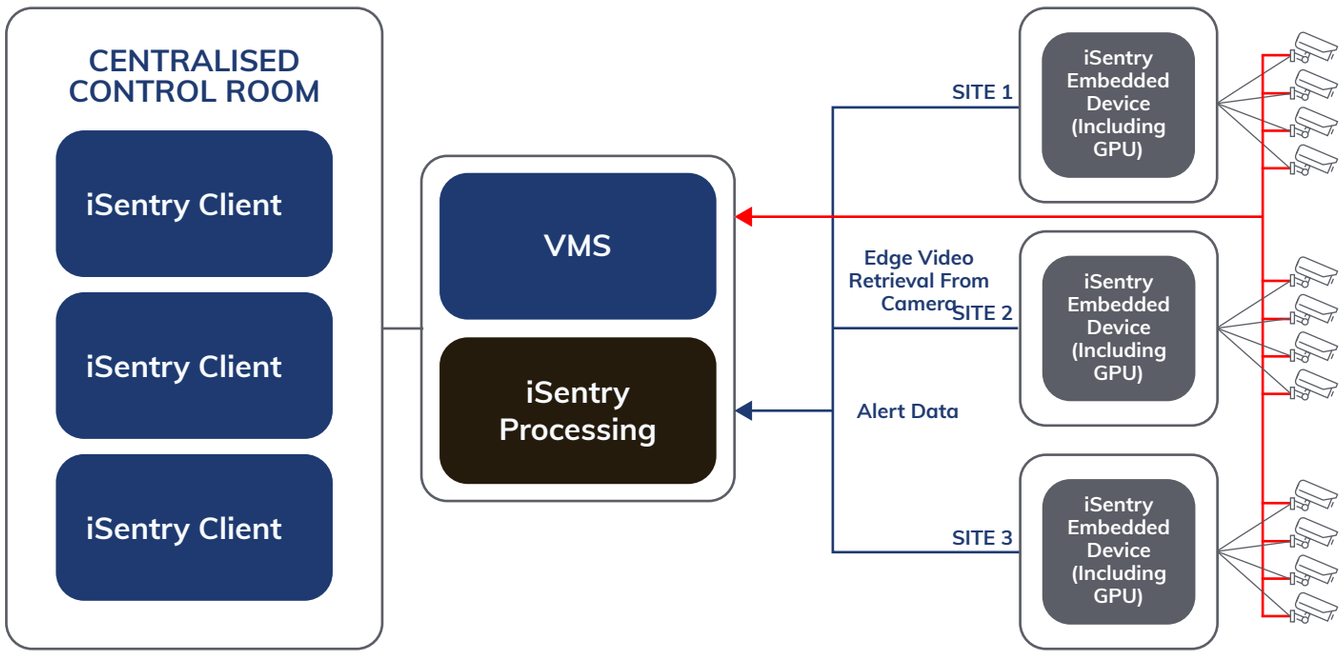
DISTRIBUTED ARCHITECTURE
System on the edge

This architecture is well suited where a central control room is required with a number of small-to-large distributed sites which need monitoing. This architecture is not limited it terms of camera numbers, and the full processing requirement is handled on site (edge). This allows for fully autonomous sites each with the capacity for its own control room if required, with recordings and data being stored on site. Only alert data is passed to the central control room and therefore bandwidth utilisation is limited to only alert data and video for each alert.



COMPLETE EDGE ARCHITECTURE
Micro embedded device including GPU

This architecture leverages the advantages of a central VMS with distributed processing, while limiting bandwidth required for live video streaming. In this architecture all of iSentry's processing is done on the edge embedded device (including Deep Learning), by ingesting live video directly from the cameras and then only sending alert data and video to the central iSentry control room.



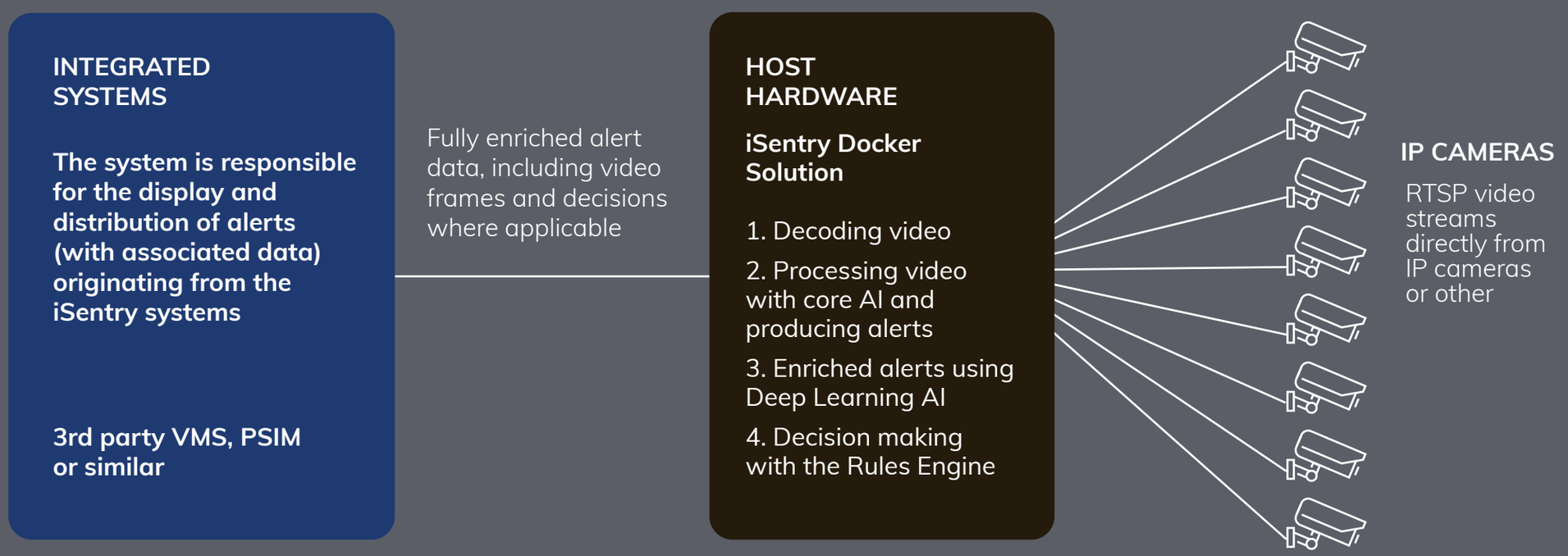
PARTIAL EDGE ARCHITECTURE
Micro embedded device excluding GPU

This architecture differs from the complete edge architecture in that only the first layer of iSentry processing is handled on the edge device, and subsequent processing layers are handled centrally. The advantages of this architecture is that the Deep Learning processing can be a fully shared resource, and a wider array of embedded devices are supported.

Integration Options

The iSentry core system is fully agnostic, and is available in an API form, which can be integrated into any VMS and PISM type solution.

The iSentry core is available as a Nvidia docker, or Linux-based service.



Highlighted Features

Hardware Efficiency And Flexibility

iSentry has been architected to provide an extremely fast and efficient base video analysis layer. Close to real-time analysis and alerting of full-motion video. This approach is always front and fore as we build, as is providing the broadest possible options around system deployment. Key improvements have been made to utilise Open VINO for onboard Deep Learning and introducing hardware acceleration - incorporating either eligible onboard HD graphics or dedicated GPU decoding hardware to supplement CPU processing.

Logic Engine

iSentry's logic engine allows for the creation of highly complex and targeted rules, allowing for the automatic management of highly complex real-life scenarios, enabling highly accurate outcomes.

Specialised Loiter Detection

iSentry's advanced individual track and loiter detection, is a "made for purpose" loiter detection tool. With specified parameters like loiter time and object size, coupled with iSentry's Deep Learning and logic engine allows for human specific alerting.

Business Intelligence

iSentry now includes a rich Business Intelligence tool and is available "out of the box" to any customer. The insight generated from this tool is invaluable in terms of operator performance KPIs, as well as system and camera performance and operation. The data warehouse underpinning this functionality allows for a range of customised BI tools to be utilised by our customers, should the need arise.

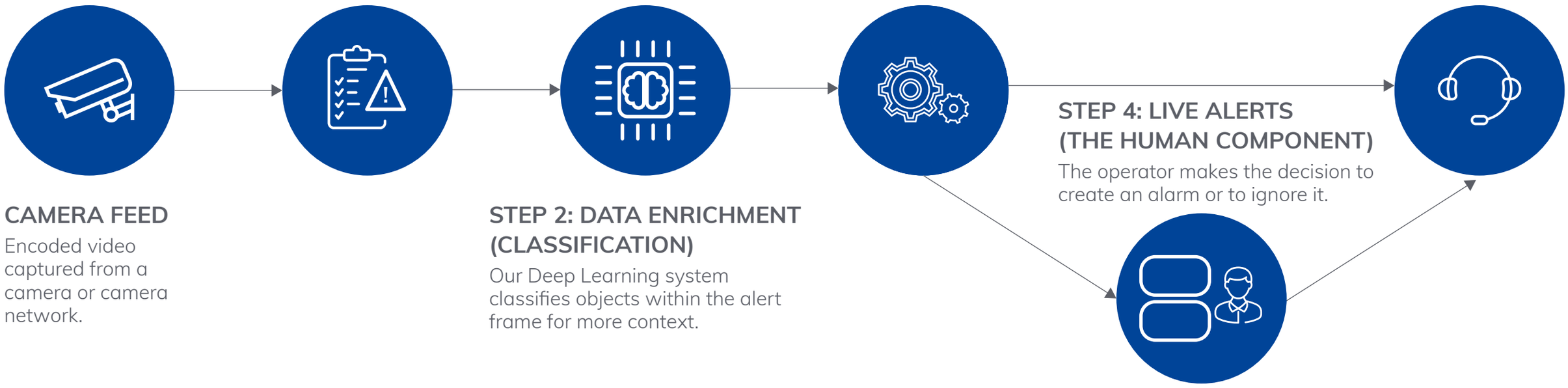
Deployment Options

Both centralised and Edge based architectures are supported by the iSentry system. With flexibility in mind, many of the iSentry system components can be virtualised, combined, or be stand-alone, allowing for resource sharing and optimisation of processing and data flow, when needed and possible.

Deep Learning

The iSentry Deep Learning engine has specifically been optimised for CCTV angles and has optimised learn sets for acute and oblique angles. The Deep Learning engine will accurately identify a multitude of object classes, and include specialised detection modules for hard-hats, helmets, facial extraction, age and gender estimation, face mask compliance and fire or smoke detection, among others.

The iSentry Process



1 iSentry efficiently decodes multiple video streams which are then analysed by one or more of its CPU-based Artificial Intelligence driven analytics resulting in an "alert", which will initiate the iSentry process.

2 A number of relevant frames, extracted from the alert video, is processed by iSentry's GPU-based Deep Learning server. This process maximises processing efficiency and provides the system with a much greater understanding of the alert.

3 Because of the increased understanding, from step 2, the system will automatically dismiss or raise to an alarm, many alerts with a very high level of certainty.

4 Those alerts that are not automatically actioned through step 3 are presented to an operator as a list of current alerts, each containing classified images as well as a +/-10 sec video clip. The operator then makes the decision on whether an alert is important (create an alarm) or not, eliminating false positives.

5 Once an alarm is generated either automatically by step 3 or by the human in step 4 the iSentry process is now complete. All data associated with the alarm including video, classifications, metadata and controller input, is included with the alarm to be processed.

COVID-19 Ready

The COVID-19 disease is having an unprecedented impact on all aspects of society. It is highly likely that the "new normal" will be accompanied by several restrictions, which will remain or be gradually reduced over time.

Because of the flexibility of the iSentry tool set, some capabilities have been re-aligned to aid with certain key aspect sure to be part of de-escalation plans for major countries around the world. These capabilities include:

- **Face mask compliance detection:** Are mask being worn and worn correctly?
- **Density and capacity control:** Maximum number of occupants in a building.
- **Social distancing management:** Maintaining minimum distance between individuals and groups.