

Cisco Kinetic for Cities Safety and Security Video Analytics (iOmniscient)

Cisco® Kinetic for Cities Safety and Security Video Analytics in crowded scenes from iOmniscient transform the existing and new video surveillance system into a proactive and intelligent tool, unifying security and operational efficiency. It accelerates the response time to incidents and helps gain a better understanding of the traffic situation. Video analytics will accurately detect events in videos, instantly inform or alarm operators, and trigger processes by sending this information to the Cisco Kinetic for Cities digital platform. Cisco Kinetic for Cities Safety and Security has an open architecture and can therefore be integrated with leading VMS systems and camera vendors.

About iOmniscient

iOmniscient is the technology leader in video analytics with a capability in analyzing realistic, complex, and extremely crowded spaces using its internationally patented technologies.

iOmniscient provides a comprehensive suite of detection and recognition systems, from simple intrusion and counting systems to unique object detection in a crowd, multilingual license plate recognition, and the world's first noncooperative facial recognition for crowded scenes.

With its extensive industry experience, the company has developed a portfolio of unique solutions for more than 30 industries ranging from airports and railways to oil refineries and road traffic management.

iOmniscient has won many international awards for its intelligent and unique products, including the Global Security Challenge for Crowded Scenes.

All iOmniscient systems are armed with an artificial intelligence–based nuisance alarm minimization system (NAMS) to help eliminate false alarms while still maintaining detection accuracy.

iOmniscient's systems have been implemented by commercial and government users in 45 countries. With its global footprint and distributed development and support centers, iOmniscient is able to offer solutions to Cisco customers across the globe.

As a pioneer in video analytics with more than 16 years of commercial experience, iOmniscient is dedicated to continuing to develop revolutionary intelligent surveillance technology and to maintain its global lead in this field.

Features

- **Face recognition (uncontrolled)**

Face recognition for crowded scenes excels in uncontrolled environments (for example, airports, railway stations) with variable lighting, continuous movement, low resolution, and variable facial angles. It increases the probability of recognition of wanted individuals in a crowd.

Fields of Application

- Law enforcement agencies, security agencies
- Airport, banks, railway stations

- **Face recognition (controlled)**

Face recognition for controlled environments (for example, standing at a counter) is a one-to-one facial recognition system.

Fields of Application

- Law enforcement agencies, security agencies
- Public buildings: ministries, embassies, courts

- **Behavior analysis (empty scenes)**

It is designed for indoor and outdoor environments even with complex light conditions. As per analytics empty scenes referred to very less crowded environment. The system is armed with NAMS, which allows robust operation in its environment with minimal false alarms. The behavior analysis includes:

- Abandoned object in empty scene
- Theft detection in empty scene
- Graffiti and vandalism detection in an empty scene
- Running detection
- Loitering detection
- Crowd counting with moving crowd

Fields of Application

- High security zones

- **Behavior analysis (crowded scenes)**

It is designed for indoor and outdoor environments even with complex light conditions

The behavior analysis includes:

- Abandoned object in a crowded scene
- Theft detection in a crowded scene
- Graffiti and vandalism detection in a crowded scene
- Slip and fall detection
- Running detection
- Loitering detection
- Crowd management, overcrowding, and congestion detection
- Crowd counting (provides crowd density with moving or stationary crowd)

Fields of Application

- Airports, railway stations
- Museums, galleries
- Concerts

- **Optional Add On: Advanced Objection Detection**

Detection of tiny objects left in very low contrast scenes where the object may be invisible to the human eye, such as where a black bag is left on a black background. The system can detect any number of objects left or removed from the scene simultaneously.

Fields of Application

- Airports, railway stations
- Museums, galleries
- Concerts
- Public areas

- **Camera video diagnostics**

Automatic alerts when cameras are disconnected or out of focus, have been physically moved or tampered with, are providing poor image quality or if they are unable to see well due to bad weather, variable lighting or other complex conditions.

Fields of Application

- Everyone who is using CCTV Cameras

- **Counting (uncontrolled)**

The system will count and give a cumulative total of the number of objects that have passed across the edge of one or more areas of interest that are drawn on the screen. The software will count traffic that passes through a region in specified directions whilst ignoring traffic from other directions.

Uncontrolled means crowded or high vehicular flow area.

Fields of Application

- Airports, railway stations
- Museums, galleries
- Concerts
- Public areas
- High security areas

- **Counting (controlled)**

The system counts and gives a cumulative total of the number of objects that have passed across the edge of one or more areas of interest that are drawn on the screen. The software counts traffic that passes through a region in specified directions whilst ignoring traffic from other directions.

Controlled means less crowded or less vehicular flow area.

Fields of Application

- Offices
- Car parks
- Low risk areas

- **Smoke and fire detection**

Detects fire and smoke. It is able to detect events in a variety of indoor and outdoor settings and can operate both during the day and night.

Fields of Application

- Outdoors (refineries, motorways, forest)
- High ceiling buildings such as warehouses and convention halls

- **Dwell time**

How much time a person spend in a particular area.

How long people spend in queues.

How long it takes to get from A to B.

Information is **totally anonymized** so there are no privacy issues.

The system can provide comprehensive reports which are valuable for business intelligence.

Fields of Application

- Airports
- Shopping malls
- Banks

- **Intrusion, perimeter protection, and wrong direction**

Detecting abnormal behavior such as people or vehicles travelling in the incorrect direction or entering in a restricted zones.

Fields of Application

- High-security zones
- Urban traffic
- Airports, railway stations

- **Yellow line detection railways**

Detect when someone reached close to the edge of the platform when the train is not at the station.

Automatically switch off detection when train is at the station.

Fields of Application

- Railways

- **Low-speed license plate recognition (speed less than 18 MPH or 30 KMPH)**

Detects license plates on vehicles and compares them with specific lists

Fields of Application

- Urban traffic management
- Car parks garages and parking lots
- Access control

- **Mobile App**

User can receive alerts anytime, anywhere on their smart phones. They can also manage the event, archive it and activate the jump to event function.

User can capture faces of individuals and send a video for the facial recognition.

Fields of Application

- Law enforcement agencies
- Security agencies
- Any customer who wishes the majority of their guards to be mobile rather than sitting in a control room

Technical Specification

Camera Specification

The following table shows the minimum camera specification to run different type of Video Analytics.

Analytics	Minimum Resolution	Minimum Object Size	Minimum Frame Rate	Minimum Camera Height	Camera View
Face Recognition (uncontrolled)	The software can work at 1xCIF but the distance at which recognition can be done is dependent on resolution. Generally use 1 to 2 mp to recognize 5 to 15m respectively	22 pixels between the eyes	6 fps	Camera placed 2-3 meters above the ground	Faces should be viewed at an angle no greater than 30 degrees
Face recognition (controlled)	1mp	60 pixels between the eyes	6 fps	Camera placed 2-3 meters above the ground	Frontal View
Behavior Analysis (Crowded Scenes)	1xCIF (0.1 megapixel)	10% of the screen height	6 fps	4-6 meter	Cameras should be angled between 45 and 60 degrees from the vertical
Behavior Analysis (Empty Scenes)	1xCIF (0.1 megapixel)	10% of the screen height	6 fps	4-6 meter	Cameras should be angled between 45 and 60 degrees from the vertical
Advanced Objection Detection	1xCIF (0.1 megapixel)	10% of the screen height (15-20 pixel needed to understand the object)	2 fps	It can be fixed at different heights, 3m, 4m, 5m, 6m as long as you see objects clear with minimum size 8'8 pixels foriq-140	Cameras should be angled between 45 and 60 degrees from the vertical
Camera Video Diagnostics	1xCIF (0.1 megapixel)	10% of the screen height	6 fps	5-6 Meter approx.	Cameras should be angled between 45 and 60 degrees from the vertical
Counting (Uncontrolled)	1xCIF (0.1 megapixel)	Camera should be mounted so that the object to be counted occupy 10% of the camera field of view	6 fps	Cameras should be mounted high above the ground with a small angle from the vertical	Cameras should be mounted high above the ground with a small angle from the vertical
Counting (Controlled)	1xCIF (0.1 megapixel)	Camera should be mounted so that the object to be counted occupy 10% of the camera field of view	6 fps	Cameras should be placed 3 to 5 meters above the ground	Top View, camera should be positioned overhead
Smoke and Fire Detection	1xCIF (0.1 megapixel)	10% of the screen height	6 fps	5 meter approx.	Cameras should be angled between 45 and 60 degrees from the vertical
Dwell Time	1 to 2 mp	Objects should be no less than 10% of the height of the camera view	6 fps	Camera placed 2-3 meters above the ground	Faces/Object should be viewed at an angle no greater than 30 degrees
Intrusion	1xCIF (0.1 megapixel)	Objects should be no less than 10% of the height of the camera view	6 fps	5 meter to cover 50 m distance	Cameras should be angled between 45 and 60 degrees from the vertical

Analytics	Minimum Resolution	Minimum Object Size	Minimum Frame Rate	Minimum Camera Height	Camera View
Perimeter Protection	1xCIF (0.1 megapixel)	Objects should be no less than 10% of the height of the camera view	6 fps	Objects should be no less than 10% of the height of the camera view	Cameras should be angled between 45 and 60 degrees from the vertical
Wrong Direction	1xCIF (0.1 megapixel)	Objects should be no less than 10% of the height of the camera view	6 fps	Ceiling height must be at least 2.5 meters. Higher ceiling height will improve performance. 4-6 m would be good height	Camera views must be overhead for optimal performance
Yellow Line Detection Railways	1xCIF (0.1 megapixel)	Objects should be no less than 10% of the height of the camera view	6 fps	4-5 Meters	Placement should allow for a view that is parallel to the platform edge
Low Speed License Plate Recognition	1 megapixel	20 pixels height	6 fps	2 meter	The lower the camera is placed the wider the angle should be. For example, 2.5 m should be at 55 degree. Generally 45 to 55 degree

* 1 x CIF = 288 x 384 pixels or .11 of a Megapixel

Software Specification

The video analytics server runs on a Microsoft Windows 64-bit operating system. Following is the list of the software which is prerequisite for the video analytics server to work.

Prerequisite

- Prerequisite to install the video analytics software. We need to have server with any of the following operating systems on the hardware mentioned in next section.

Prerequisite
Windows 7 Professional/Enterprise/Ultimate
Windows Server 2008 R2
Windows 8/8.1
Windows Server 2012/Server 2012 R2
Windows Embedded 8 (for use with super-edge device from recommended vendor only)

* **Facial-recognition** requires Windows 7 (x64) or Windows Server 2008R2 and higher operation system.

- The additional prerequisite is that for large databases, that is, if the facial recognition or license plate recognition whitelist or blacklist is more than 500,000 customers, need to purchase Enterprise Level MS SQL. This also helps in data resilience and multicore search.

Hardware Specification

The video analytics server can run on a virtualized server. A Cisco UCS server with similar or more specifications as mentioned in the following can be used. Following is the minimum server specification for the features mentioned in the table below.

Prerequisite

Following is the hardware prerequisite to run the different kind of analytics.

The following specification can run up to four camera licenses of iQ-Face Recognition.

Component	Minimum
CPU	2 x E5-2650 v4, 12 Cores, 2.20 GHz, 30MB SmartCache, 9.6 GT/s QPI
Memory	2 x 32 GB DDR4 2400MHz ECC
Hard Disk	1 x 240 GB Intel SSD 6 x 1 TB 12G SAS 7.2K RPM SFF HDD 2 drives of raid 5, i.e. 3 each.
LAN	Broadcom 5709 Dual-Port Ethernet PCIe Adapter M3
Power	Dual Power supply -2 x 650W Power Supply
Virtualization	VMware

The following specification can run up to 40 licenses of other video analytics detection products (abandoned object in crowded or complex scenes plus behavior analysis plus smoke).

Component	Minimum
CPU	2 x E5-2650 v4, 12 Cores, 2.20 GHz, 30MB SmartCache, 9.6 GT/s QPI
Memory	2 x 32 GB DDR4 2400MHz ECC
Hard Disk	1 x 240GB Intel SSD 6 x 1 TB 12G SAS 7.2K RPM SFF HDD 2 drives of raid 5, i.e. 3 each
LAN	Broadcom 5709 Dual-Port Ethernet PCIe Adapter M3
Power	Dual Power supply -2 x 650W Power Supply
Virtualization	VMware

The following specification can run up to four licenses of low-speed license plate recognition (speeds less than 18 MPH or 30 MPH).

Component	Minimum
CPU	2 x E5-2650 v4, 12 Cores, 2.20 GHz, 30MB SmartCache, 9.6 GT/s QPI)
Memory	2 x 16 GB DDR4 2400MHz ECC
Hard Disk	1 x 240GB Intel SSD 6 x 500 Gb SATA2 7200rpm 2 drives of raid 5, i.e. 3 each
LAN	Broadcom 5709 Dual-Port Ethernet PCIe Adapter M3
Power	Dual Power supply -2 x 650W Power Supply
Virtualization	VMware

Client Workstation Hardware Requirement: This client workstation is used for viewing and monitoring alarms. Each client workstation can connect multiple servers (can support up to 100 channels of M-JPEG views each at CIF and 6 fps).

Component	Minimum
CPU	Intel Core i3 Processor 3.0Ghz
Memory	4 GB DDR2 800MHz
Hard Disk	250 GB SATA2 drive
CD/DVD	DVD+-RW
LAN	Intel Pro/1000- uniform Gigabit NIC
Graphics	Separate PCI Express Graphics Card with 1GB RAM (i.e. not onboard graphics) must support DirectX 9 and above
Power	400W Power Supply
OS	Windows OS mentioned in the Software Prerequisite section

Ordering Information

SKUs

Product SKU	Product Support SKU	Description
SS-CIM-IQ-FCRP=		iOmniscient Per Camera Channel Feature License -Face Recognition (uncontrolled)
	SS-CIM-IQ-FCRP-1Y	iOmniscient Face Recognition (uncontrolled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-FCRL=		iOmniscient Per Camera Channel Feature License -Face Recognition (controlled)
	SS-CIM-IQ-FCRL-1Y	iOmniscient Face Recognition (controlled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-ADBP5=		iOmniscient per image license Up to 5000 Images
SS-CIM-IQ-ADBP10=		iOmniscient per image license between 5000 - 10000 Images
SS-CIM-IQ-ADBP20=		iOmniscient per image license between 10000 - 20000 Images
SS-CIM-IQ-INFP=		iOmniscient Per Camera Channel Feature License -Behavior Analysis (Crowded Scenes)
	SS-CIM-IQ-INFP-1Y	iOmniscient-Behavior Analysis (Crowded Scenes) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SP2=		iOmniscient Per Camera Channel Feature License -Behavior Analysis (Empty Scenes)
	SS-CIM-IQ-SP2-1Y	iOmniscient-Behavior Analysis (Empty Scenes) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-180U=		iOmniscient Per Camera Channel Advanced Objection Detection Add-on License to IQ-INFP-C
	SS-CIM-IQ-180U-1Y	iOmniscient Advanced Objection Detection Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SSHP=		iOmniscient per Camera Video Diagnostics license
	SS-CIM-IQ-SSHP-1Y	iOmniscient Video Diagnostics Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-110P=		iOmniscient Per Camera Channel Feature License -Counting (Uncontrolled)
	SS-CIM-IQ-110P-1Y	iOmniscient Counting (uncontrolled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-85P=		iOmniscient Per Camera Channel Feature License -Counting (Controlled)
	SS-CIM-IQ-85P-1Y	iOmniscient Counting (Controlled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SMAP=		iOmniscient Per Camera Channel Feature License -Smoke and Fire Detection
	SS-CIM-IQ-SMAP-1Y	iOmniscient Smoke and Fire Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-DTSP=		iOmniscient 2 Camera Channel Feature License -Dwell Time
	SS-CIM-IQ-DTSP-1Y	iOmniscient Dwell Time Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-80P=		iOmniscient Per Camera Channel feature License – Intrusion, Perimeter Protection, & Wrong Direction
	SS-CIM-IQ-80P-1Y	iOmniscient Intrusion, Perimeter Protection & Wrong Direction Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-YLD=		iOmniscient Per Camera Channel Feature License -Yellow Line Detection Railways
	SS-CIM-IQ-YLD-1Y	iOmniscient Yellow Line Detection Railways Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-MDIP=		iOmniscient Mobile App License
	SS-CIM-IQ-MDIP-1Y	iOmniscient Mobile App Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-LRCP=		iOmniscient 4 Camera Channel License - Low Speed License Plate Recognition (Speed Less than 20KMH)
	SS-CIM-IQ-LRCP-1Y	iOmniscient Low Speed License Plate Recognition Software Upgrade and Support Services for 12 Months

Year 2 Onward Support SKU	
Support SKU	Description
SS-CIM-IQ-FCRP-1Y=	iOmniscient Face Recognition (uncontrolled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-FCRL-1Y=	iOmniscient Face Recognition (controlled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-INFP-1Y=	iOmniscient-Behavior Analysis (Crowded Scenes) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SP2-1Y=	iOmniscient-Behavior Analysis (Empty Scenes) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-180U-1Y=	iOmniscient Advanced Objection Detection Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SSHP-1Y=	iOmniscient Video Diagnostics Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-110P-1Y=	iOmniscient Counting (uncontrolled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-85P-1Y=	iOmniscient Counting (Controlled) Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-SMAP-1Y=	iOmniscient Smoke and Fire Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-DTSP-1Y=	iOmniscient Dwell Time Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-80P-1Y=	iOmniscient Intrusion, Perimeter Protection & Wrong Direction Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-YLD-1Y=	iOmniscient Yellow Line Detection Railways Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-MDIP-1Y=	iOmniscient Mobile App Software Upgrade and Support Services for 12 Months
SS-CIM-IQ-LRCP-1Y=	iOmniscient Low Speed License Plate Recognition Software Upgrade and Support Services for 12 Months

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