Technology

Video Analytics
Operational Insights from CCTV

Arnoud van Zuijlen

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Enhancing Past Video Surveillance Investments

From **Video Surveillance**…

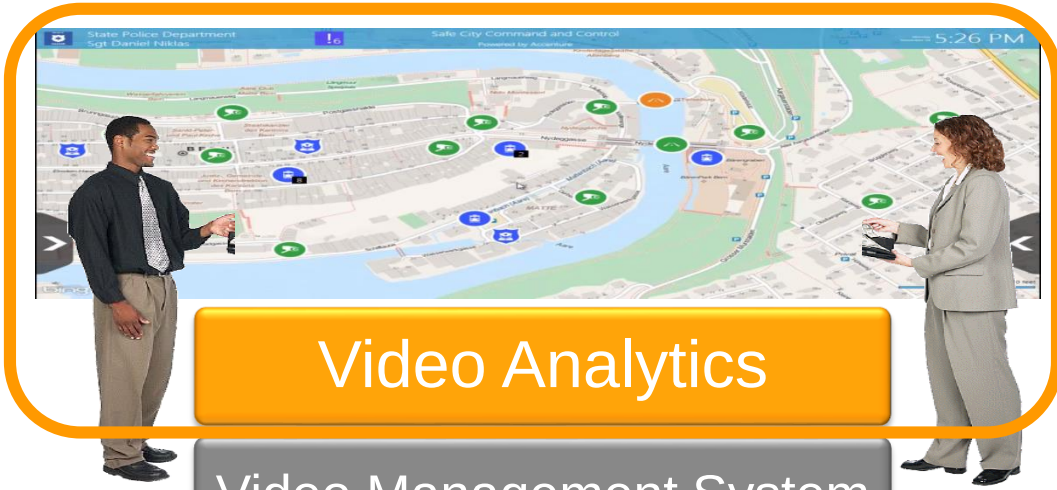
Operator monitoring 20+ screens
Showing feeds from 100+ cameras
Trying to stay alert! 98%*, 95%**...

Video Management System

CCTV Cameras

To **Operations Centre**

Safety, Security & Operations



Video Analytics

Video Management System

CCTV Cameras

* 98% of video feeds go unseen
** 95% of incidents missed after 20'

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Automated Observation with Computer Vision: Safety, Security, Operations

Three key trends are transforming the Video Analytics space:

- CCTV cameras are **increasingly digital**, and **improving in optics, resolution, frame rate**
- IP **networks bandwidth, processing and storage** are making CCTV cameras **part of the IT infrastructure**
- **Computer Vision algorithms** have evolved to generate reliable alerts for operators and applications

Biometrics

Crowd counting

Traffic monitoring

License plate recognition

Cross-camera tracking

Footfall tracking

Safety alerts

Incident detection

Suspicious behaviour

Left object detection

Video indexing

Post-event analysis

Object recognition

Augmented reality

Wide-spectral imagery

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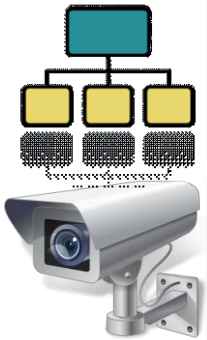
From traditional Video Feeds to Business Alerts



Command and Control

Streaming Analytics

- Suspicious vehicle recognized, traffic jam detected, …
- Overcrowding detected, fugitive face recognized, …
- Object too long in one place, intrusion detected, suspicious behaviour, …

Video Analytics

- Number of cars, license plates recognized, speed of vehicles, …
- Number of people, faces recognized, walking speed of people, …
- Object stationary for certain time, average dwelling time, …

CCTV Camera Feeds

20+ business alerts / day

1,500 – 9,000 micro events/second

50 Camera Feeds

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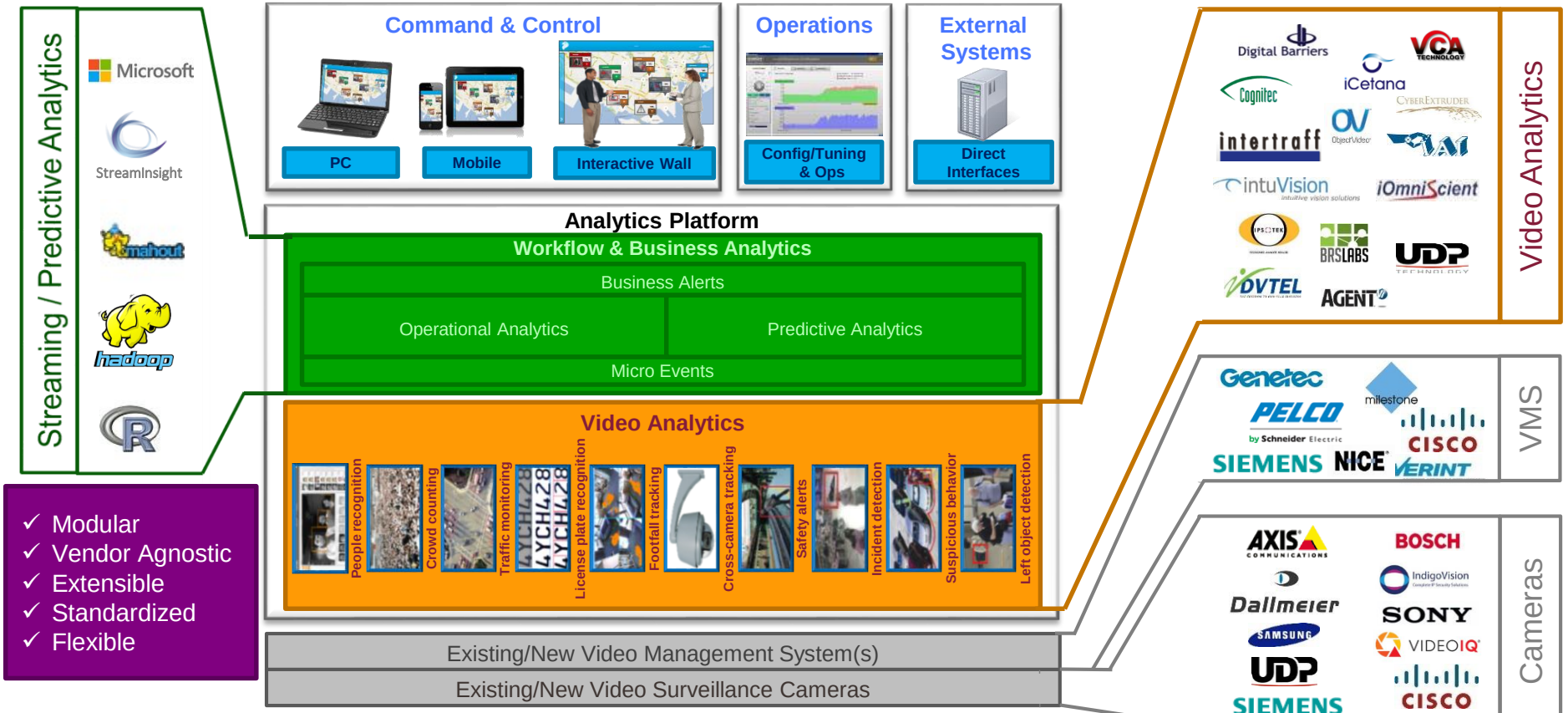
Video Analytics – vendor agnostic



- ✓ Modular
- ✓ Vendor Agnostic
- ✓ Extensible
- ✓ Standardized
- ✓ Flexible

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Case Study: Singapore Ministry of Home Affairs Safe City Testbed

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Case Study: Singapore Ministry of Home Affairs Safe City Testbed

Showcased at World's Cities Summit

2 Major events supported

Formula 1

marina bay SINGAPORE COUNTDOWN 31 DEC 2013 2014

44 Requirements trialed, including Operational Use-Cases across Agencies

6 Agencies: SPF,SCDF, NEA,LTA, PUB,MHA

48 'Live' feed sources integrated

24 feeds (2 MRT stations)

12 J-Eyes feeds

12 PCZ feeds

~700GB of recorded Videos

~600GB of detection and alert data generated

4 Video Analytics software integrated

IPSOTEK intertraff VCA Cognitec

12 Simulation Models built

Advanced Analytics with each simulation model on average consisting of **150+** parameters

>20 Aggregated Business rules

Leveraging common data formats integrated from Visualization to sensor

9 Agile Sprints

Sep'13					Oct'13				Nov'13				Dec'13					Jan'13			
Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14	Wk15	Wk16	Wk17	Wk18	Wk19	Wk20	Wk21	Wk22
02-Sep	09-Sep	16-Sep	23-Sep	30-Sep	07-Oct	14-Oct	21-Oct	28-Oct	04-Nov	11-Nov	18-Nov	25-Nov	02-Dec	09-Dec	16-Dec	23-Dec	30-Dec	06-Jan	13-Jan	20-Jan	27-Jan
Sprint 0		Sprint 1			Sprint 2		Sprint 3		Sprint 4		Sprint 5		Sprint 6		Sprint 7		Sprint 8	Closure			

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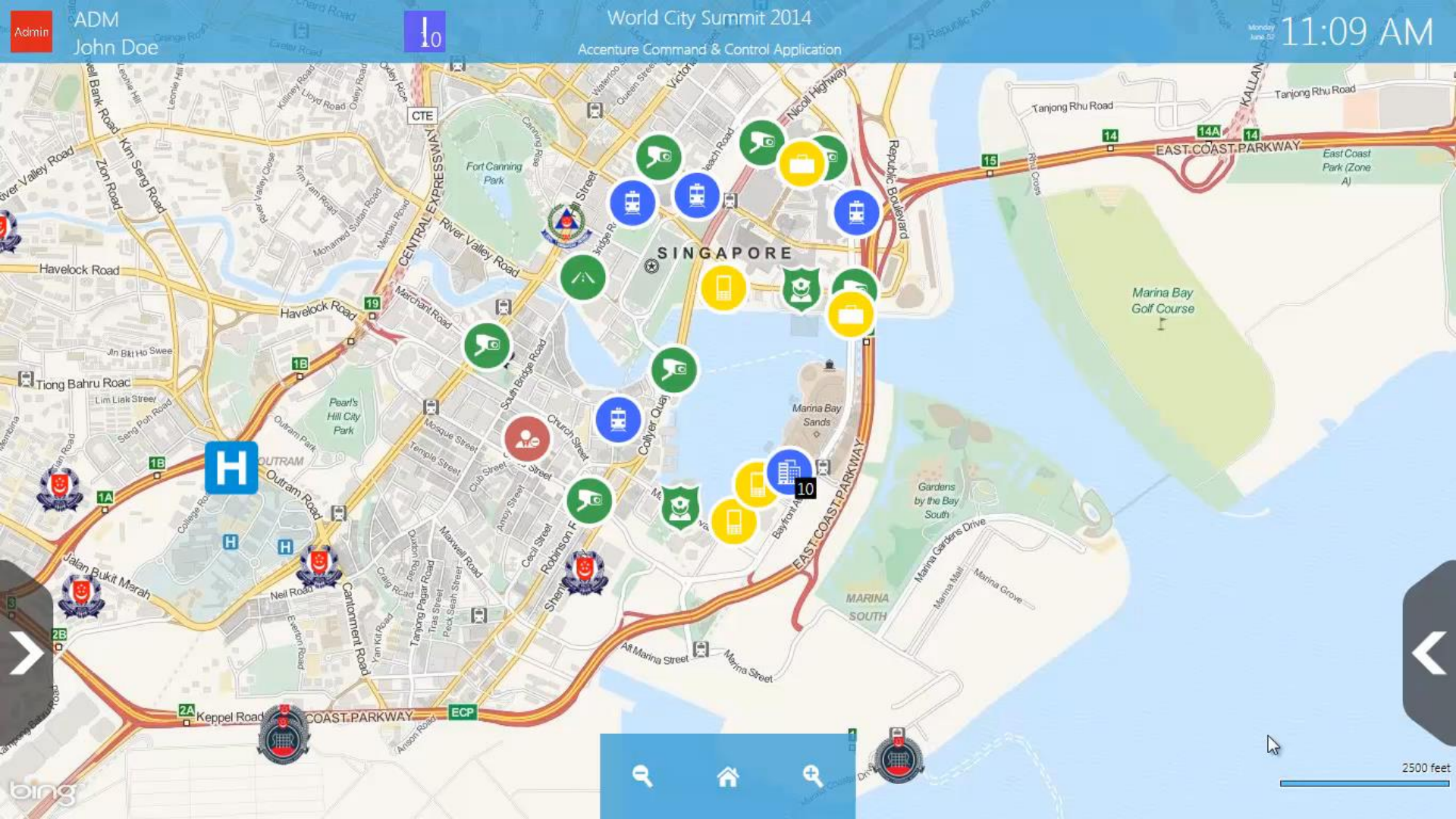

Admin
ADM
John Doe
World City Summit 2014
Accenture Command & Control Application
11:09 AM
SINGAPORE
Fort Canning Park
Marina Bay Golf Course
Marina Bay Sands
Pearl's Hill City Park
Gardens by the Bay South
MARINA SOUTH
East Coast Park (Zone A)
CENTRAL EXPRESSWAY
EAST COAST PARKWAY
Havelock Road
River Valley Road
Outram Road
Keppel Road
Tanjong Rhu Road
Nicoll Highway
Republic Boulevard
Collyer Quay
South Bridge Road
Cantonment Road
Marina Boulevard
Marina Gardens Drive
Marina Mall
Marina Grove
Merrina Street
Alt Marina Street
Tiong Bahru Roac
Jalan Bukit Merah
Neil Road
Tanjong Pagar Road
Robinson Road
Church Street
Mosque Street
Temple Street
Club Street
Cecil Street
Maxwell Road
Craig Road
Duxton Road
Exeter Road
Anson Road
Yan Kit Road
Trias Street
Peck Seah Street
Amoy Street
Bayfront Avenue
Merchant Road
Mohamed Sultan Road
Zion Road
Kim Seng Road
Kim Yam Road
Valley Close
Leonie Hill
Killiney Road
Lloyd Road
Oxley Road
Waterloo Street
Queen Street
Victoria Street
Beach Road
Bridge Road
Canning Rise
Rhu Cross
Seng Poh Road
Lim Liak Street
Jln Bkt Ho Swee
Outram Park
College Road
Merbau Road
Havelock Road
CTE
ECP
14
14A
15
19
1A
1B
2A
2B
3
10
2500 feet
bing

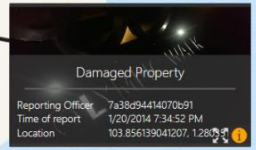
City Hall MRT

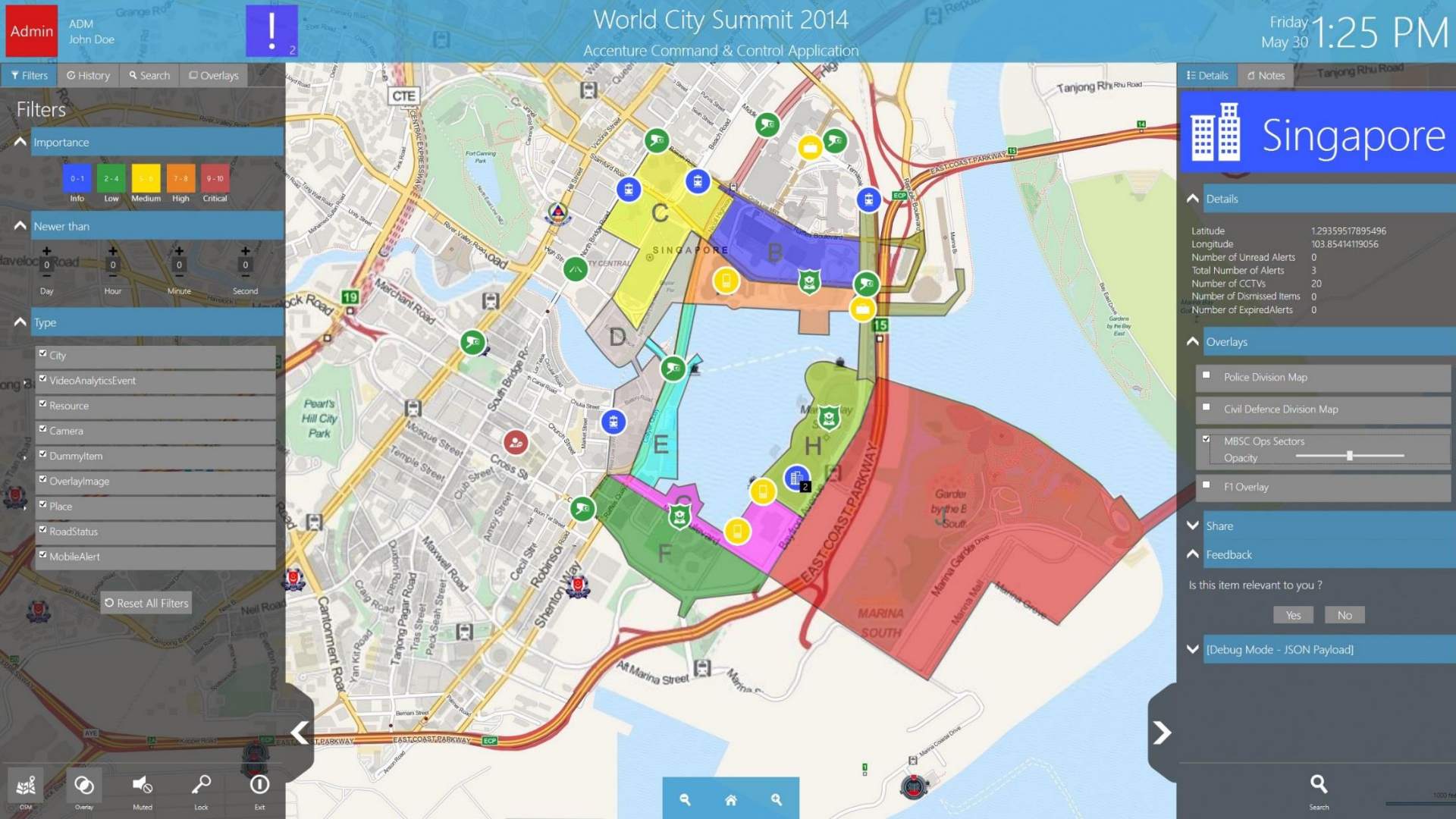
East-West Line	EW13
North-South Line	NS25

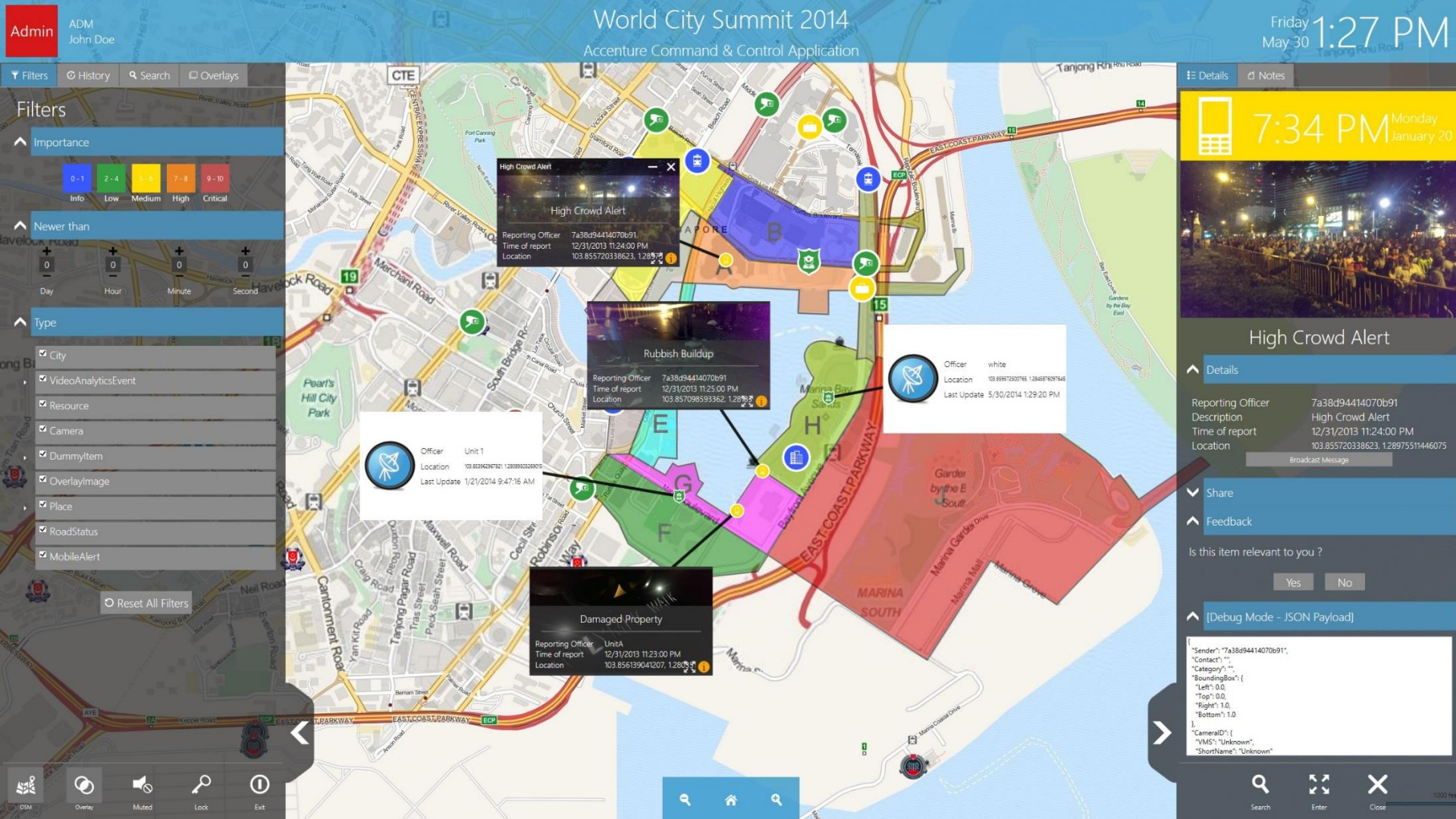
World City Summit 2014

World City Summit 2014

WORLD CITIES SUMMIT




Admin
ADM
John Doe
2
World City Summit 2014
Accenture Command & Control Application
Friday
May 30
1:25 PM
Filters
History
Search
Overlays
Filters
Importance
0 - 1
Info
2 - 4
Low
5 - 6
Medium
7 - 8
High
9 - 10
Critical
Newer than
Day
Hour
Minute
Second
Type
City
VideoAnalyticsEvent
Resource
Camera
DummyItem
OverlayImage
Place
RoadStatus
MobileAlert
Reset All Filters
OSM
Overlay
Muted
Lock
Exit
Details
Notes
Singapore
Details
Latitude 1.29359517895496
Longitude 103.85414119056
Number of Unread Alerts 0
Total Number of Alerts 3
Number of CCTVs 20
Number of Dismissed Items 0
Number of ExpiredAlerts 0
Overlays
Police Division Map
Civil Defence Division Map
MBSC Ops Sectors
Opacity
F1 Overlay
Share
Feedback
Is this item relevant to you ?
Yes
No
[Debug Mode - JSON Payload]
Search
SINGAPORE
MARINA SOUTH
EAST COAST PARKWAY
Tanjong Rhu Road
Merchant Road
Cantonment Road
Maxwell Road
Shenton Way
Robinson Road
Cross St
South Bridge Rd
Pearl's Hill City Park
Marina Gardens Drive
Marina Coastal Drive
Alt Marina Street
CTE
ECP
AYE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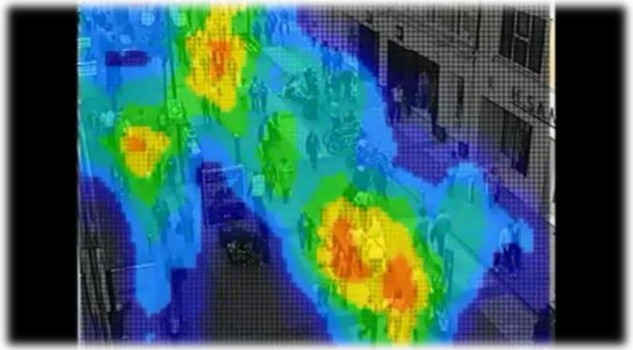
9 - 10
Critical
Newer than
Day
Hour
Minute
Second
Type
City
VideoAnalyticsEvent
Resource
Camera
DummyItem
OverlayImage
Place
RoadStatus
MobileAlert
Reset All Filters
High Crowd Alert
Reporting Officer 7a38d94414070b91
Time of report 12/31/2013 11:24:00 PM
Location 103.855720338623, 1.28
Rubbish Buildup
Reporting Officer 7a38d94414070b91
Time of report 12/31/2013 11:25:00 PM
Location 103.857098593362, 1.28
Officer Unit 1
Location
Last Update 1/21/2014 9:47:16 AM
Officer white
Location
Last Update 5/30/2014 1:29:20 PM
Damaged Property
Reporting Officer UnitA
Time of report 12/31/2013 11:23:00 PM
Location 103.856139041207, 1.28
Details
Notes
7:34 PM
Monday
January 20
High Crowd Alert
Details
Reporting Officer 7a38d94414070b91
Description High Crowd Alert
Time of report 12/31/2013 11:24:00 PM
Location 103.855720338623, 1.28975511446075
Broadcast Message
Share
Feedback
Is this item relevant to you ?
Yes
No
[Debug Mode - JSON Payload]
{
"Sender": "7a38d94414070b91",
"Contact": "",
"Category": "",
"BoundingBox": {
"Left": 0.0,
"Top": 0.0,
"Right": 1.0,
"Bottom": 1.0
},
"CameraID": {
"VMS": "Unknown",
"ShortName": "Unknown"
OSM
Overlay
Muted
Lock
Exit
Search
Enter
Close

Video Analytics in prisons

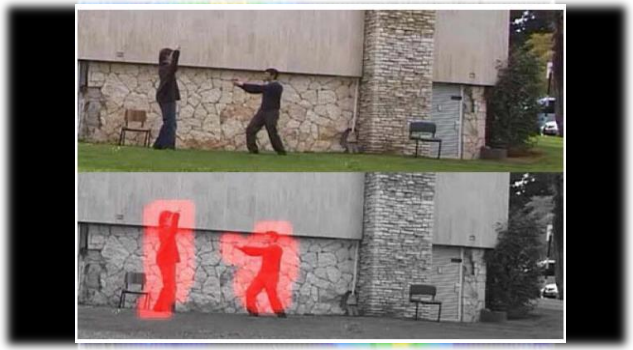
Measuring people flows

Counting people in and out

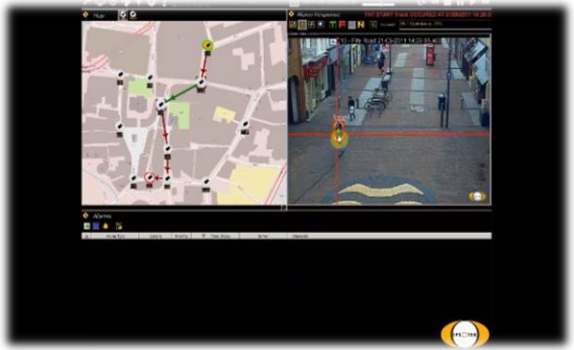
Identifying / verifying people



Measuring crowd density



Identifying behavior



Tracking flows across cameras

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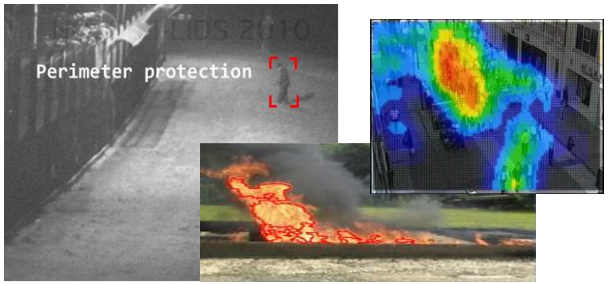
Video Analytics Applications in prison environment

Video analytics enables active and real-time monitoring of prison environment and activation of safety and security incident alerts and responses. In addition, analytical and predictive modeling help optimize police operations.

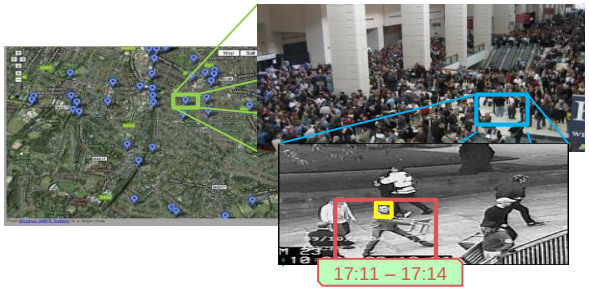
Safety
"Active, Responsive"

Examples
- Restricted / forbidden zone access
- Overcrowding
- Anomaly detection – Smoke & fire
- Incident response activation



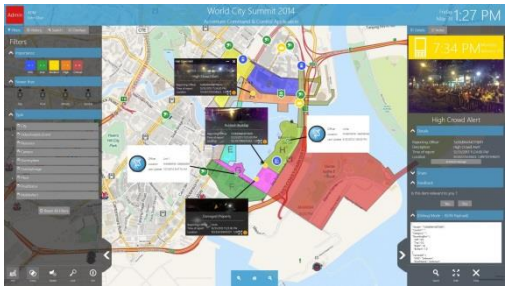
Security
"Real-time, Decisive"

Examples
- Face / vehicle license plate recognition
- Person of interest tracking
- Suspicious behavior/sabotage/vandalism
- Crowd counting
- Fighting
- Abandoned objects



Operations
"Optimization"

Examples
- Situational awareness
- Location of fixed and mobile assets
- Officer shortest route analysis
- Specific events management
- Post event investinvestigations
- Resource monitoring & optimization



Reduction of manpower requirements → Improved safety & security performance → Better command, control and response → Greater operational efficiencies

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Summary

Integrating diverse sensor networks and Video Analytics algorithms, to **foster innovation and reduce vendor lock-in**

Real time **geo-coded business alerts**, leveraging **simulation and predictive analytics** to assist decision-making

Cost reducing while safety increasing

Not just cameras, but also mobile apps, fire alarms, building management systems, …

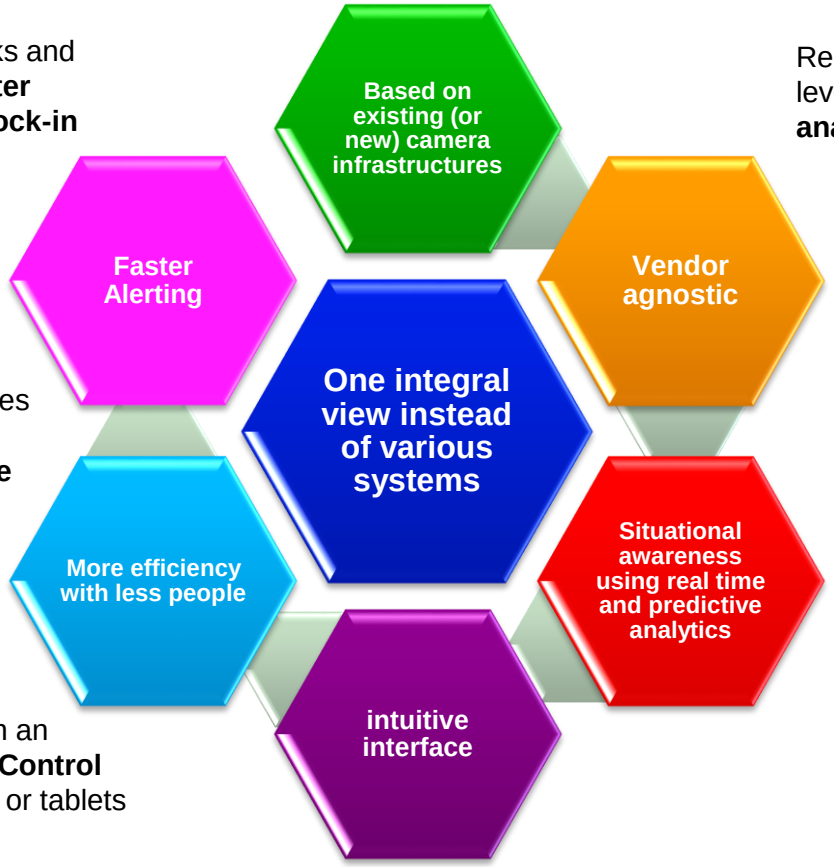
No proprietary formats, clear interfaces to **seamlessly upgrade and scale**; ability to **add functionality over time**

One **integral view** of the entire environment

Focus on prisoners, not on cameras

Live video feeds and real-time alerts in an **intuitive, touchscreen Command & Control application** for interactive walls, PCs or tablets

Leveraging past video surveillance investments to deliver additional value



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Technology

Thank You

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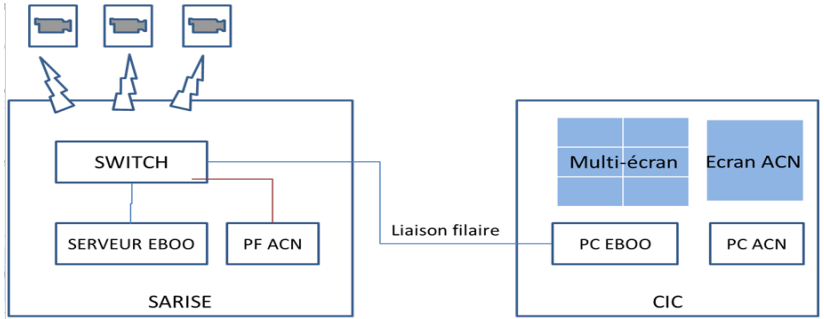
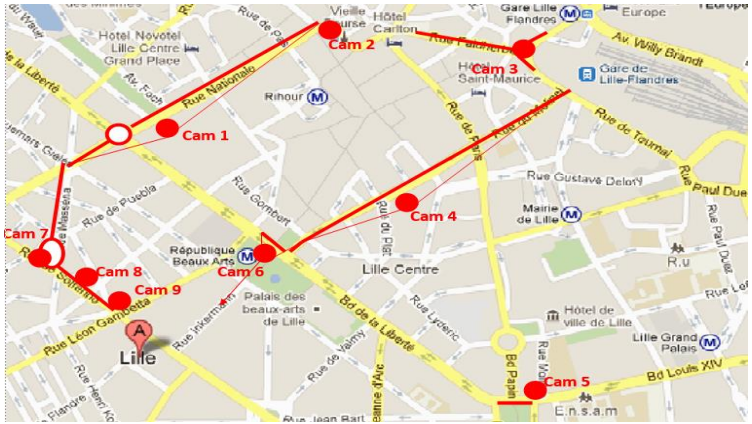
Case Study: French Police Pilot – Braderie Lille

- Executing the Accenture Video Analytics Service Platform in SARISE
  - Deployed the VASP pilot kit
  - Connected 9 cameras to access live feed
  - PTZ cameras with pre-sets for adapting VA calibrations
- Scenarios:
  - Suspicious Behaviour detection
  - Illegal Parking
  - Unauthorized Entry
  - People and Vehicle Counting
  - Abandoned Object
  - Crowd Flow Counting





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