

Video Surveillance Systems for Border Security

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Why Video Surveillance

- Improve public safety;
- Mitigate risks of crime and terrorism;
- Protect assets;
- Prevent fraud;
- Border security;
- Automate more processes:
 - Train dispatch;
 - Self-checking counters.
- Provide better healthcare.



Video Surveillance Projects Types

- **Low-end**

- City surveillance (low scale)
- Enterprise
- Campuses
- Plants
- Gas stations
- ATMs



- **High-end**

- City surveillance (high scale)
- Border control
- Railways security
- Gas/Oil pipeline security
- Facilities
- Airports, seaports
- Traffic surveillance



High-End Video Surveillance

- **High Capacity** - Mega-Pixel cameras consuming high bandwidth;
- **Advanced Applications** - License-plate or face recognition (e.g. as an applicable evidence in court)
- **Real Time** - Focused alerts, maximum information for manned patrols;
- **Mission-critical** - No tolerance for system downtime or quality degradation.

CCTV application areas

Border security:

traffic monitoring, border control

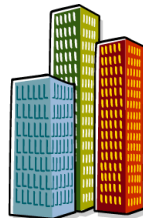


Transport :

Railways, airports and ports



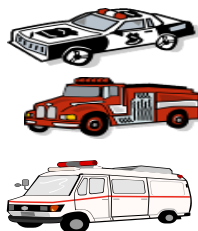
Government buildings :
Museums and military bases



Educational institutions:
Distance learning,
Telemedicine



Public Security:
Police/Fire/Ambulance



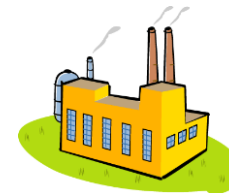
CCTV: Closed Circuit Television



Energy:
Oil & Gas, Utilities



Manufacturing:
Production line quality
management



**Leisure and entertainment
areas :**
Stadiums



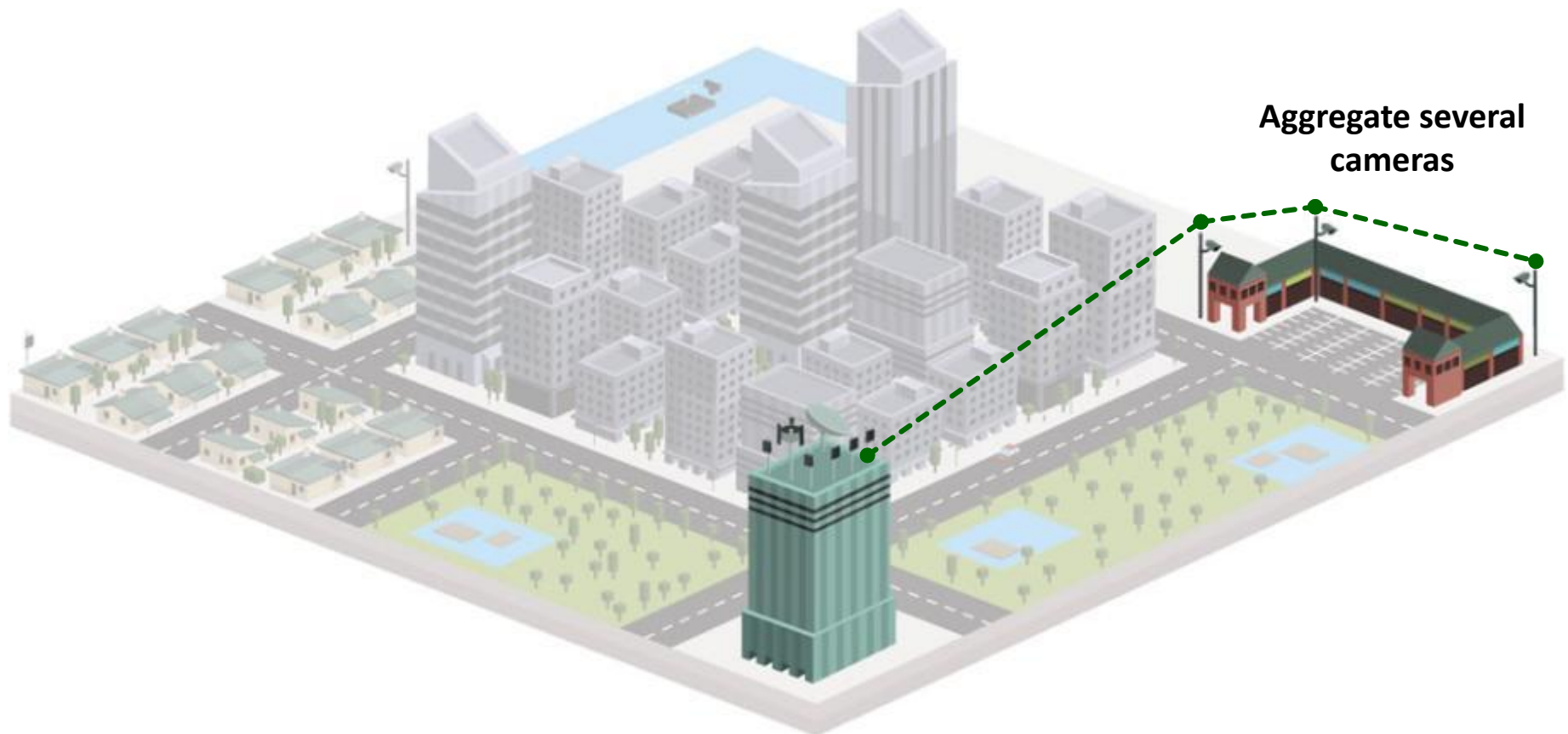
Commercial units :
Retail outlets, banks and casinos



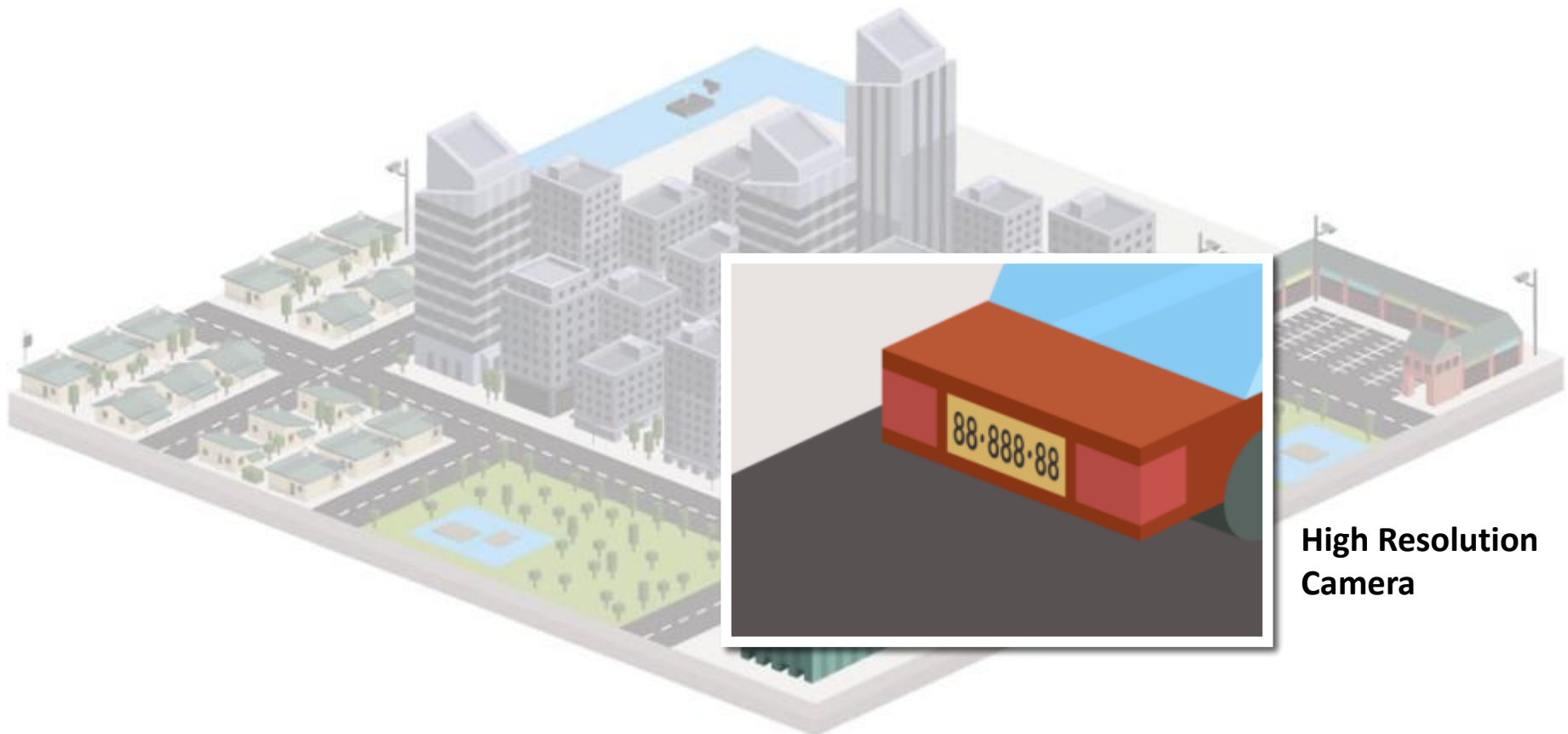
City Surveillance Scenarios



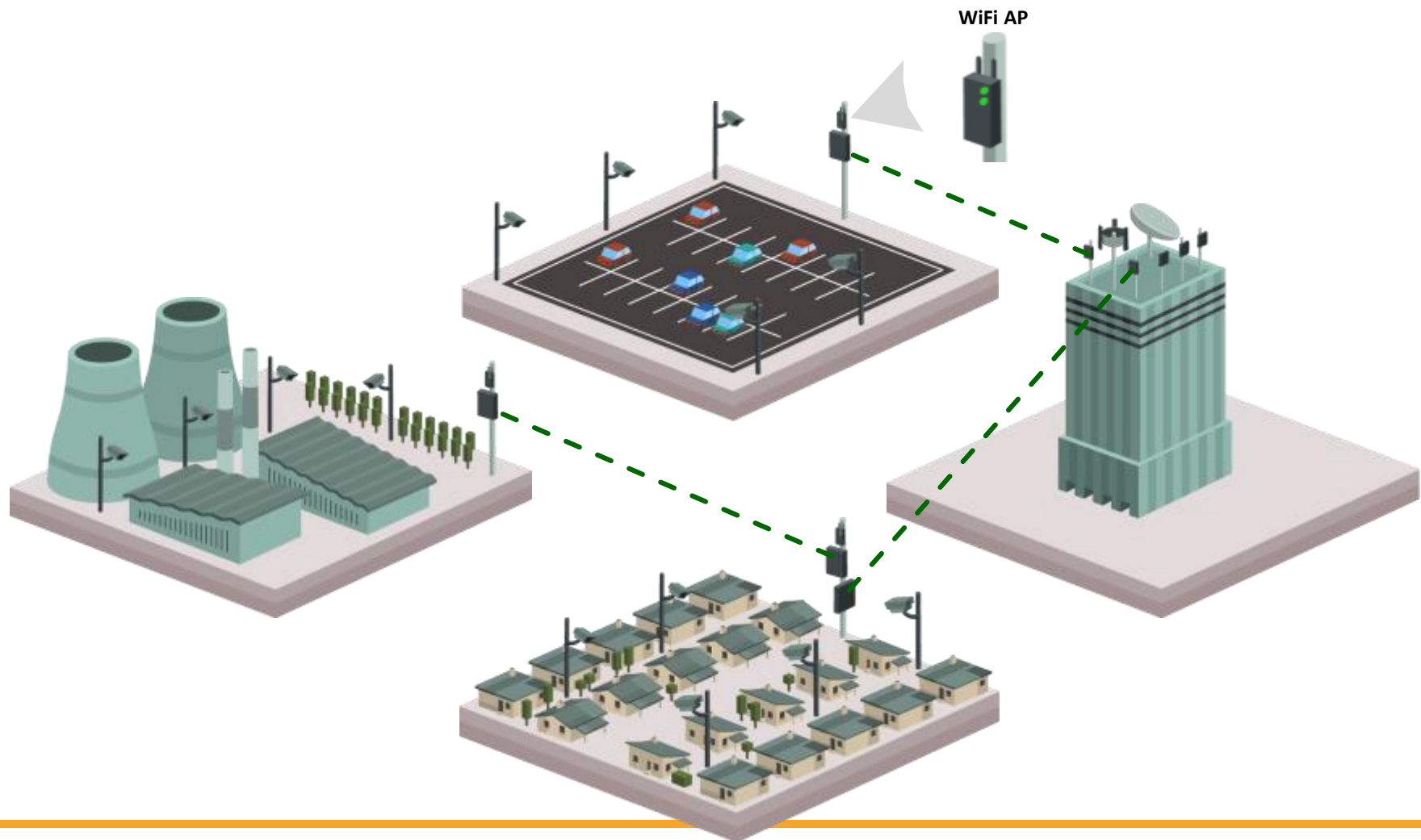
City Surveillance Scenarios



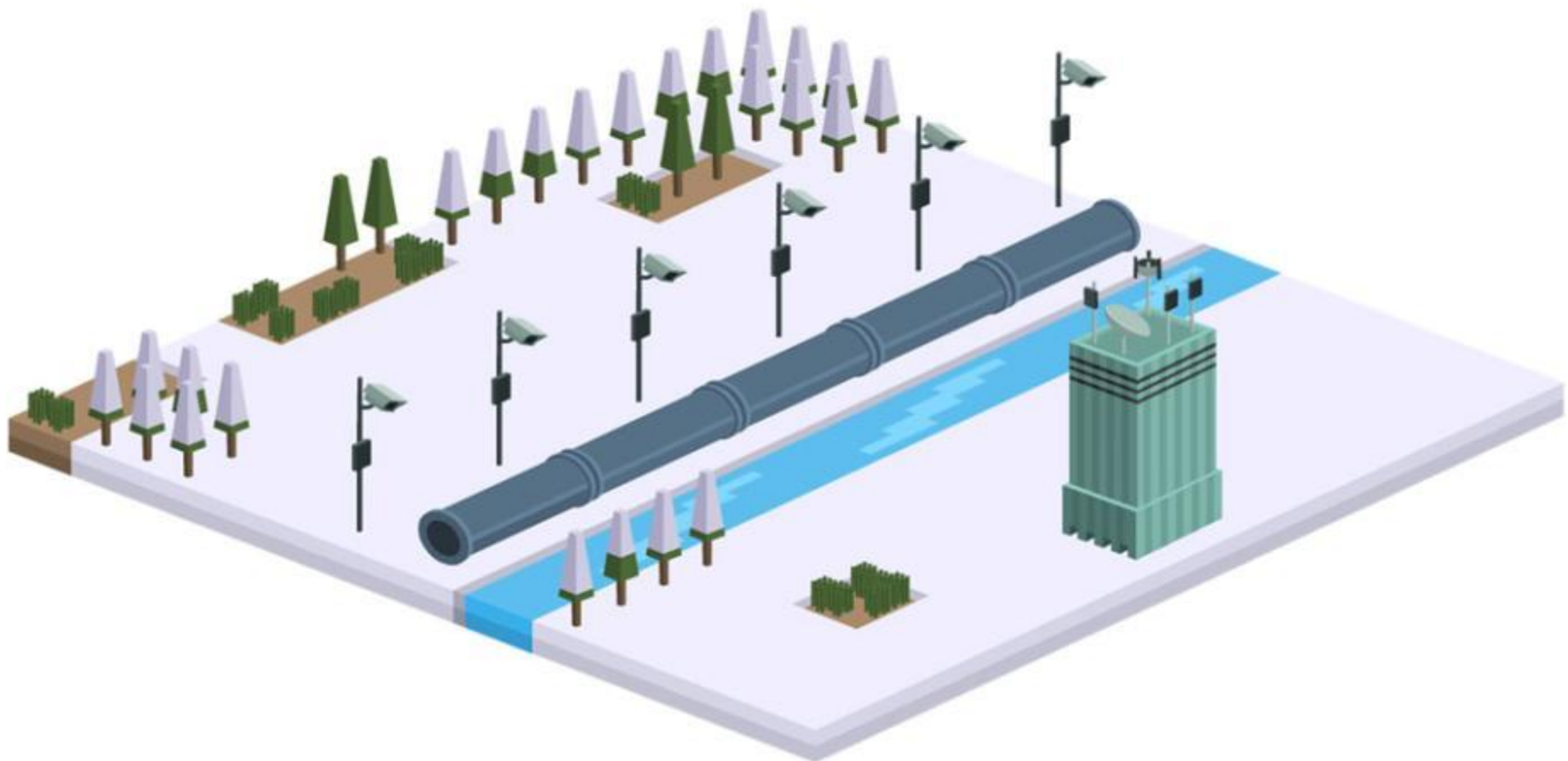
City Surveillance Scenarios



City Surveillance Scenarios



Gas/Oil Pipelines Protection



Transportation/Railways Security



Border Protection



Border Protection

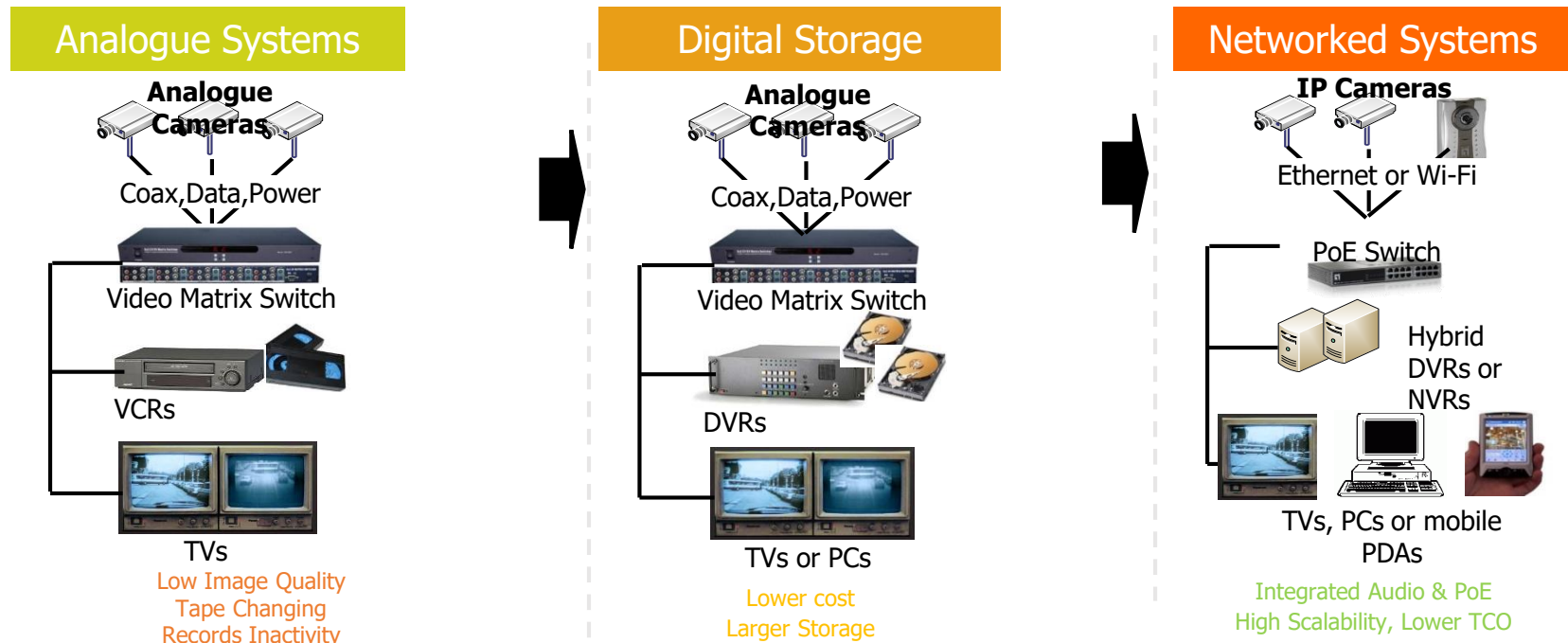
- Forbidden Zone protection;
- Intruder detection;
- Object tracing;
- Object detection of moving trail in open area;
- Suspicious behavior detection.



Video Technology today

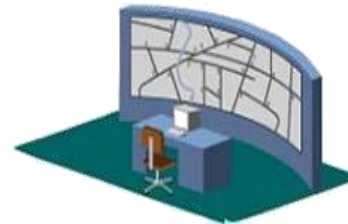
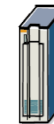


Video Surveillance Evolution

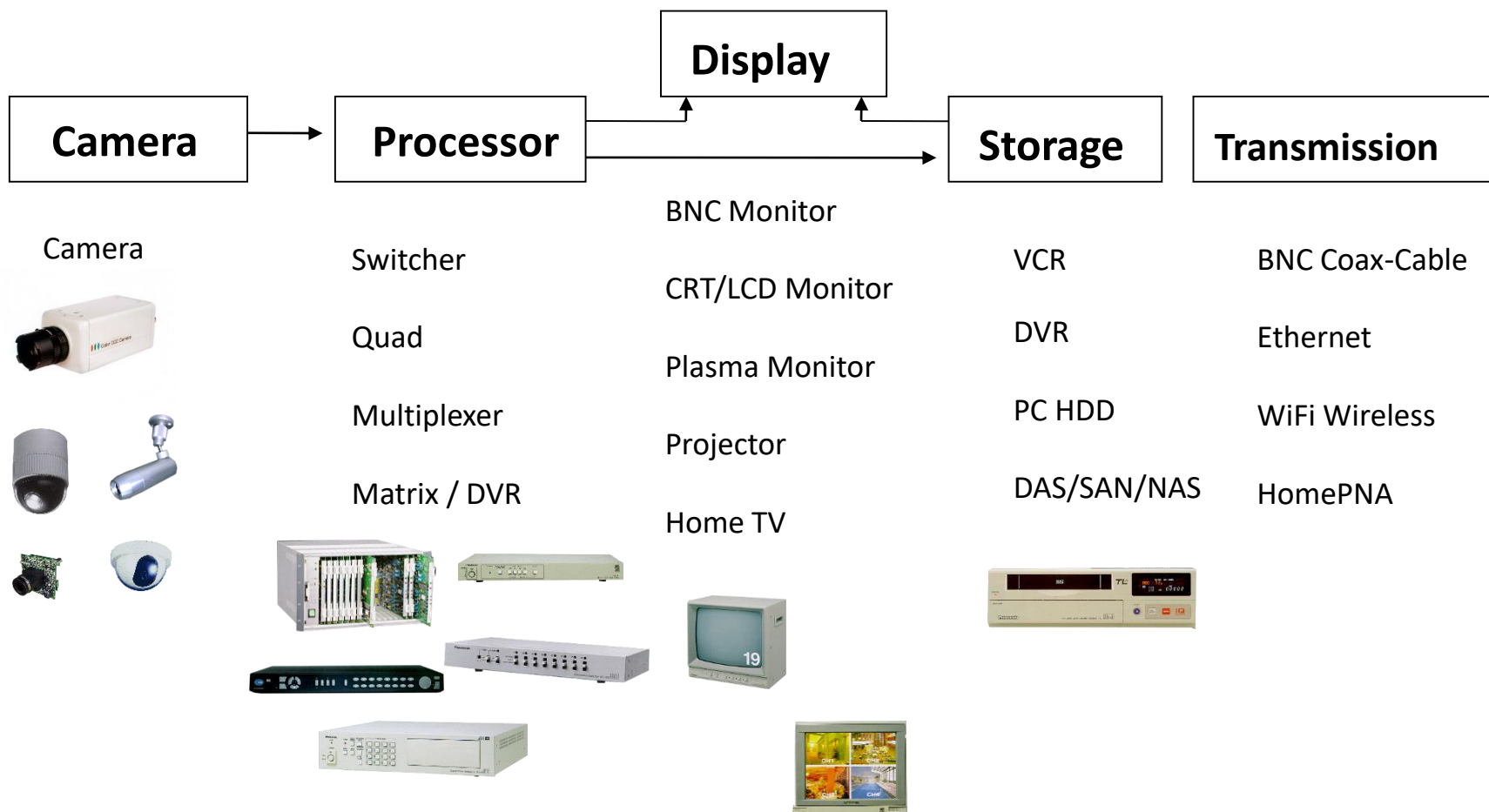


CCTV System Components

- Camera
 - Analog or IP
 - Fixed or PTZ (Pan, Tilt, Zoom)
 - Standard or High definition
- Encoder
 - Typically consists of a modular analog to IP video converter
 - Supports different encoding formats
 - MJPEG, MPEG2, MPEG4 (part2), H.264
- DVR/NVR
 - Digital or Networked Video Recorder
- Video Management System
 - Centralized, Distributed
- Control Center
 - Display Wall
 - Storage
- Network

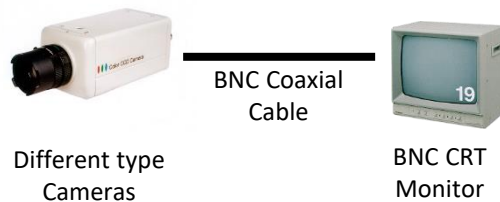


Current Surveillance System

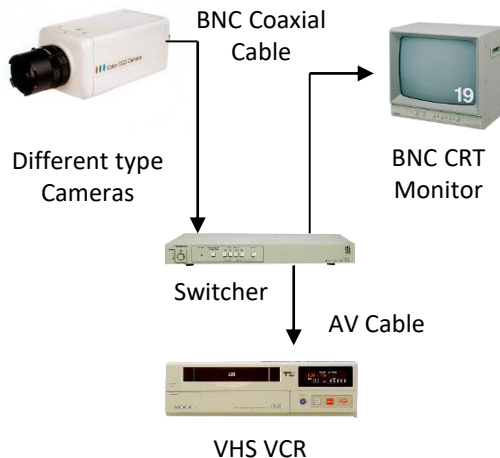


Traditional CCTV Diagram

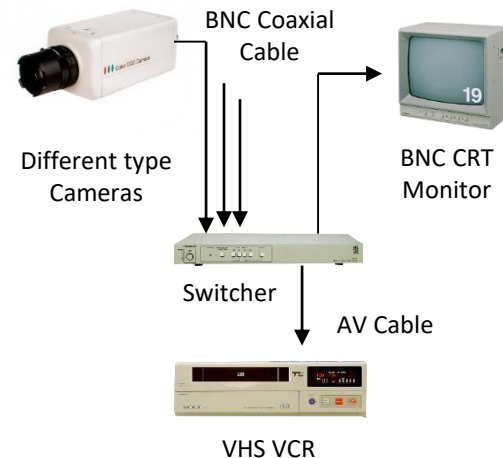
Live View Only



Live View and Recording



Live View and Recording (Multiply Cameras)

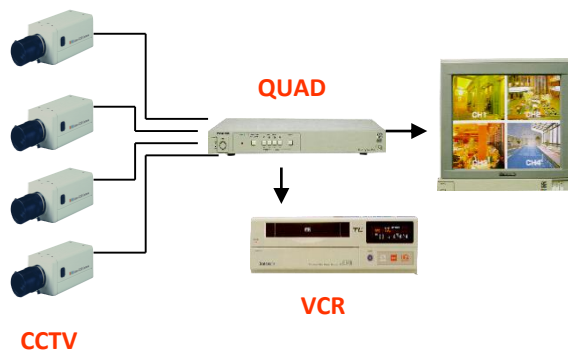


1. Only one camera image will record in VCR
2. Only one camera image will display at BNC CRT Monitor

Traditional CCTV Diagram

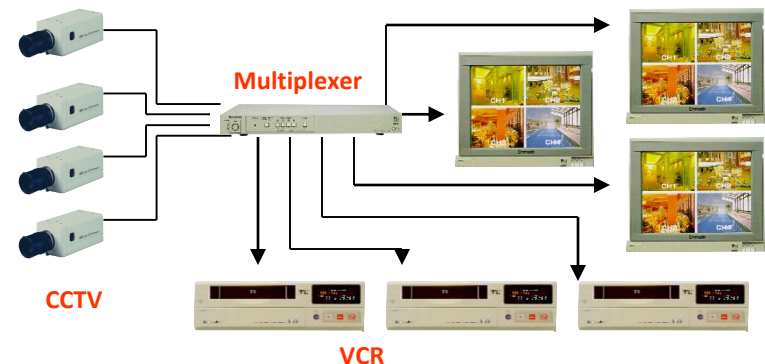
• Advance Live View and Recording

Live View and Recording (Multiply Cameras)



1. Display Max 16 split screen for 16 Cameras at monitor
2. One camera per record or 16 split screen image per record
3. Can set 4 / 9 / 16 Split screen at monitor
4. Can set 4 / 9 group shift rotate of cameras at split screen
5. When playback what you record what you playback at monitor

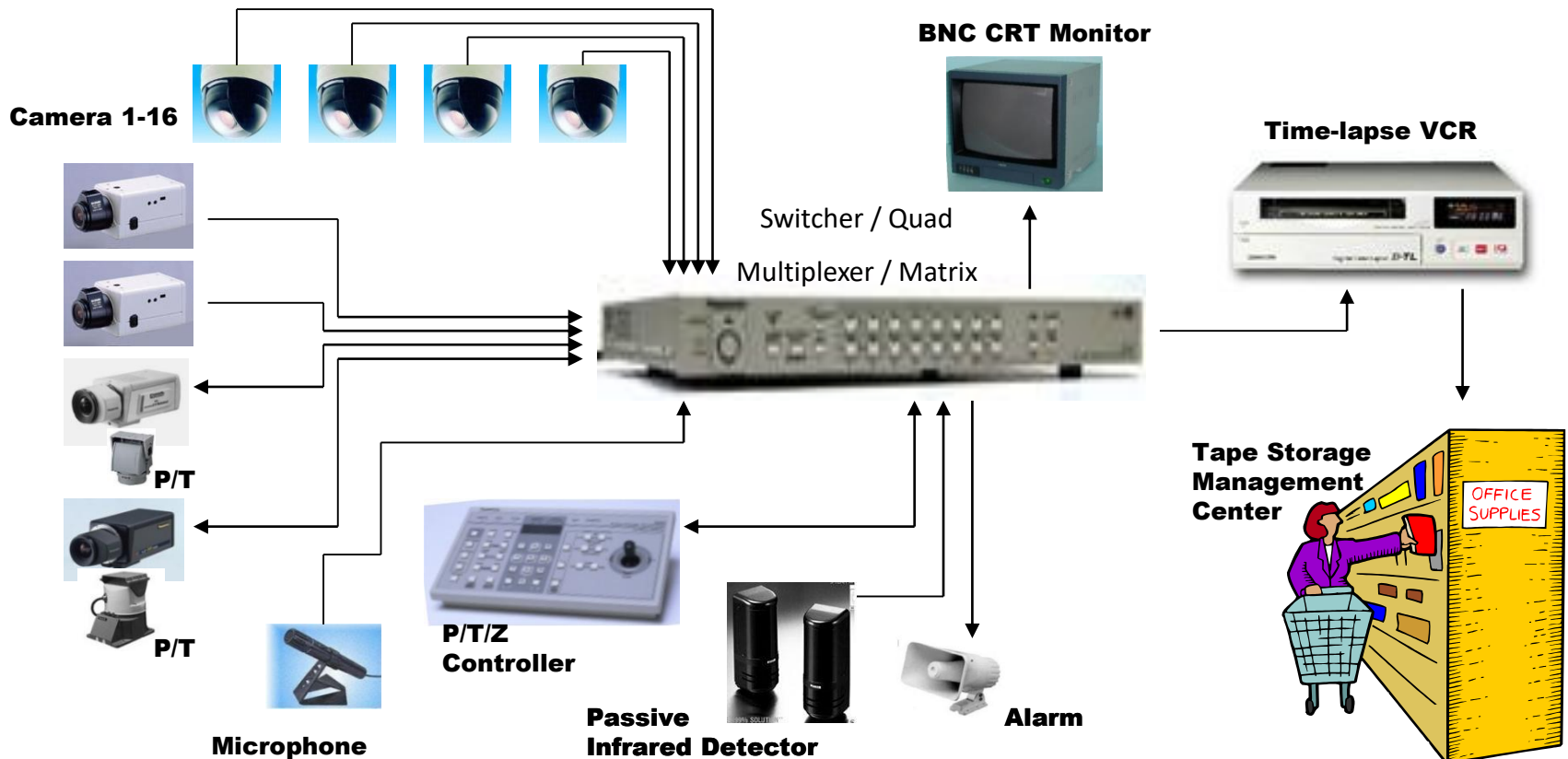
Live View and Recording (Multiply Devices)



1. Display Max 16 split screen for 16 Cameras at monitor
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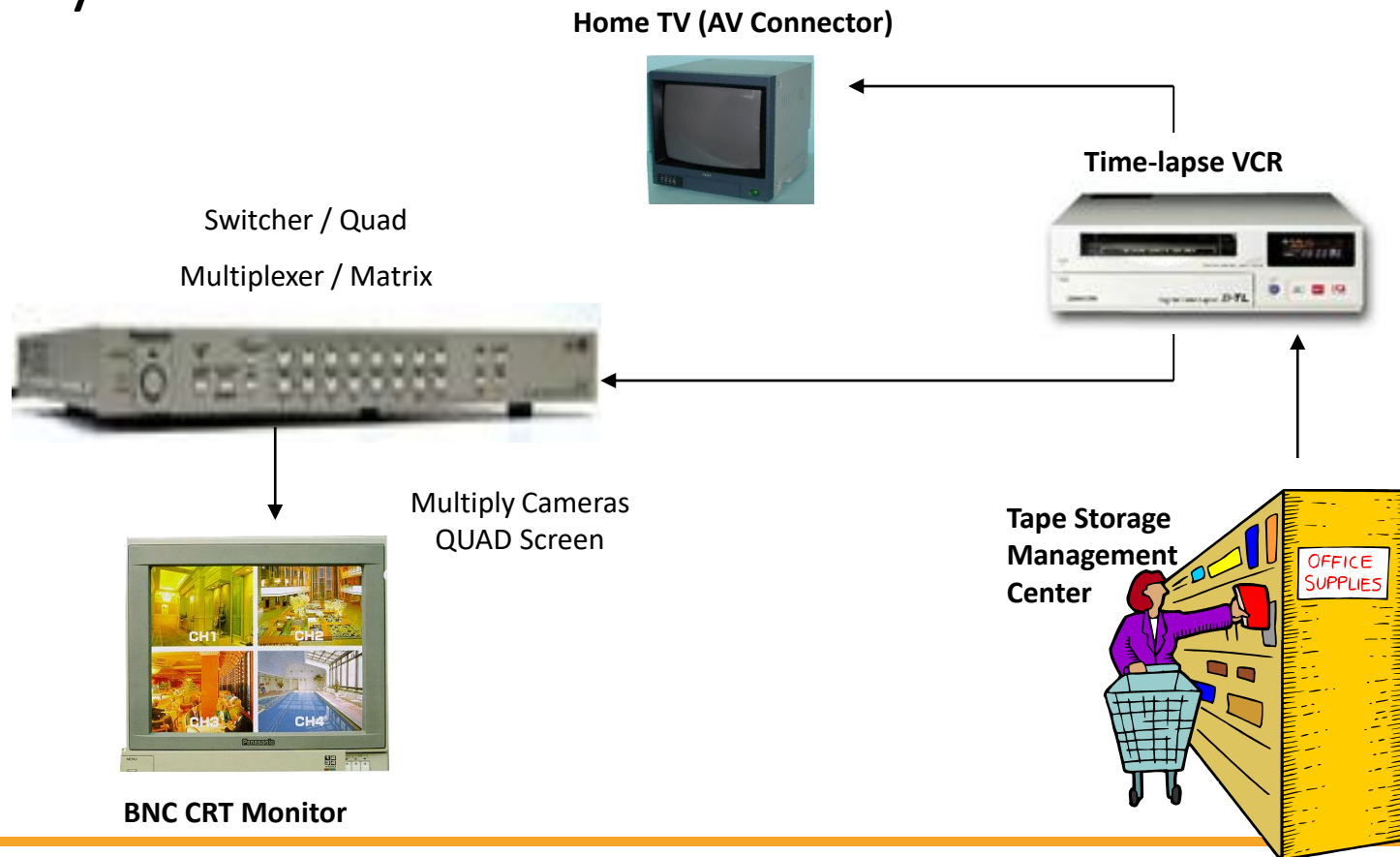
Traditional CCTV Diagram

- Multiplex Live View and Recording



Traditional CCTV Diagram

- Playback



Traditional CCTV Diagram

- **Strength**

- Easy to installed;
- Easy to operated;
- Easy to get supply.

- **Weakness**

- High maintain cost
- Need Tape Library
- Poor playback quality
- Can't record / playback simultaneous
- VCR head, motor / belt and VHS tape damage frequently
- No record during camera shifted
- Lost record during tape rewind

- **Opportunity**

- Manufacture keep supply in market with cheaper initiate cost

- **Threats**

- Double invest with new technologies in future
- No maintain support in future
- Video record can not as evidence in court
- Central administration is difficult in different location

Traditional CCTV Diagram

- Digital Video Record (DVR) System



Digital Video Record(DVR) System

- **Strength**

- Exterior solution with outstanding performance;
- Easy to operate, expand, and upgrade;
- Intelligent Recording Modes.

- **Weakness**

- Capturing / Display / Record / Remote Surveillance all in one DVR system;
- Difficult to loading balance of each function.

- **Opportunity**

- Internet & Multimedia Environment;
- Great Advantage of Networking Storage Solution Backup.

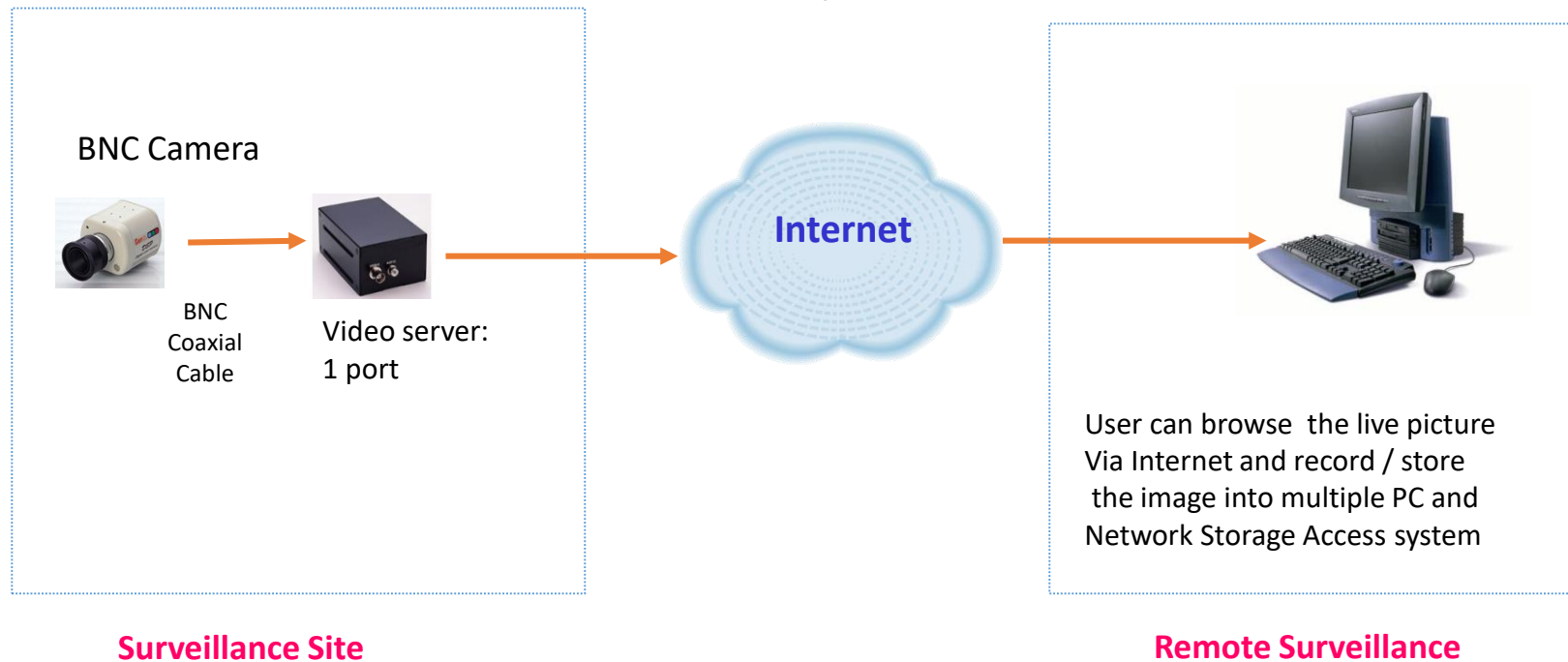
- **Threats**

- Analog CCTV systems still selling in many markets.
- Window Base still carries wide presence in the market;
- Confusion between IT & Security Industry.

Digital Video Server System

- Digital Video Server

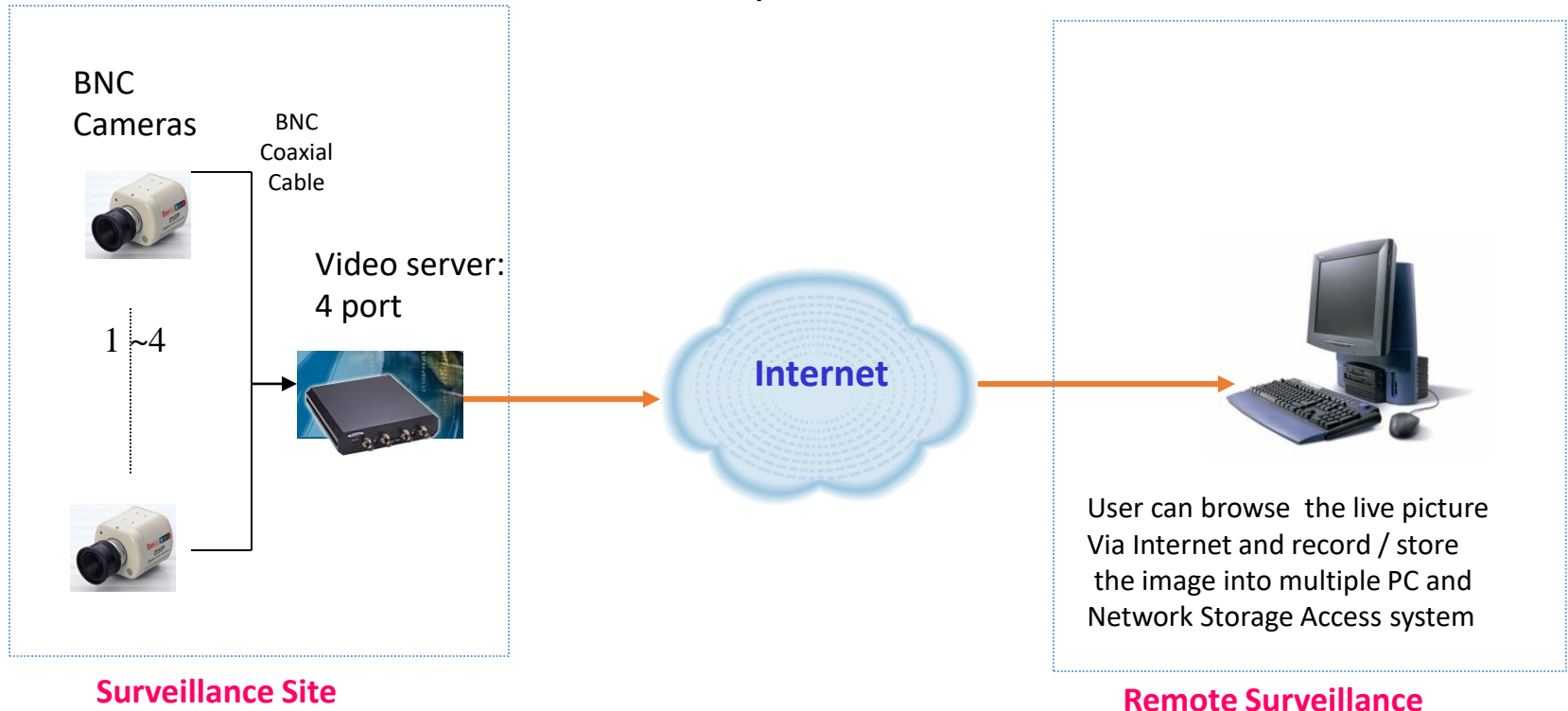
- The user can view the live picture from web server via internet



Digital Video Server System

- Digital Video Server

- The user can view the live picture from web server via internet



Digital Video Record(DVR) System

- **Strength**

- Same As Digital Video Recorder (DVR);
- System operated focus at Imaging Capturing / and Transmission function;
- Multiply Display / Record location support.

- **Weakness**

- No Internal Storage feature support;
- Maximum support 4 or more cameras connected.

- **Opportunity**

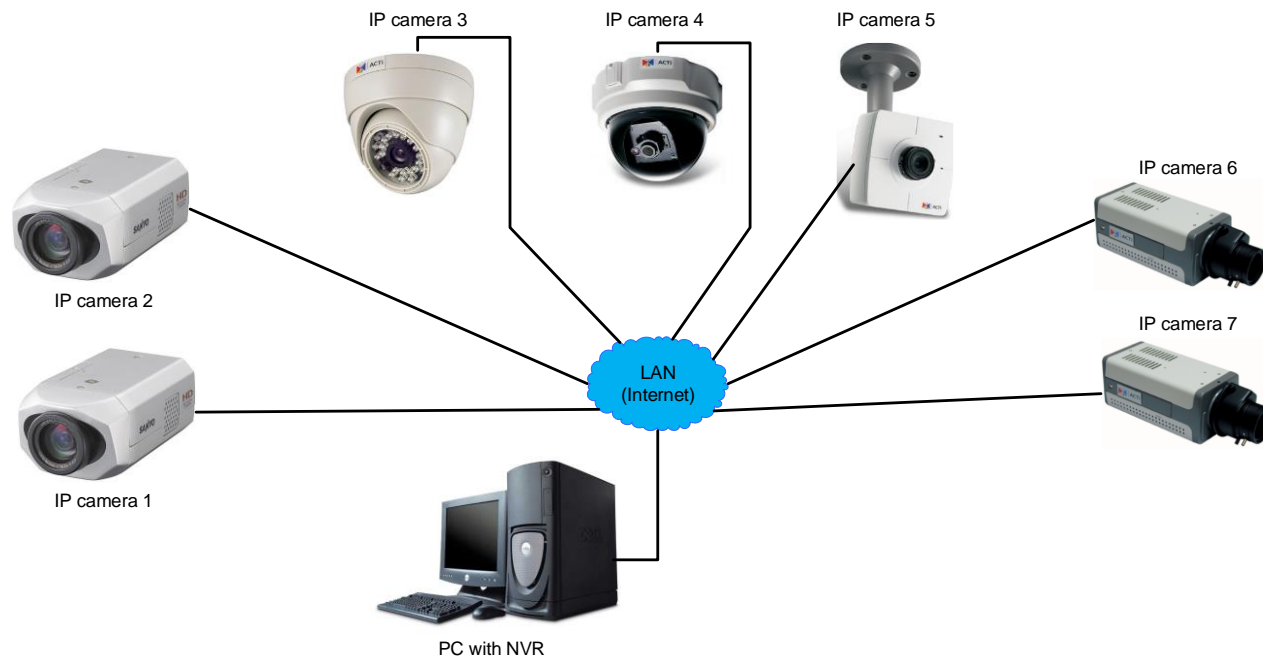
- Internet & Multimedia Environment;
- Great Advantage of Networking Storage Solution Backup.

- **Threats**

- Analog CCTV recording systems still selling in many markets.
- Lack of customer and channel education on Internet IP implementation and their advantages over CCTV and IP based systems;
- Confusion between IT & Security Industry.

IP Video Surveillance

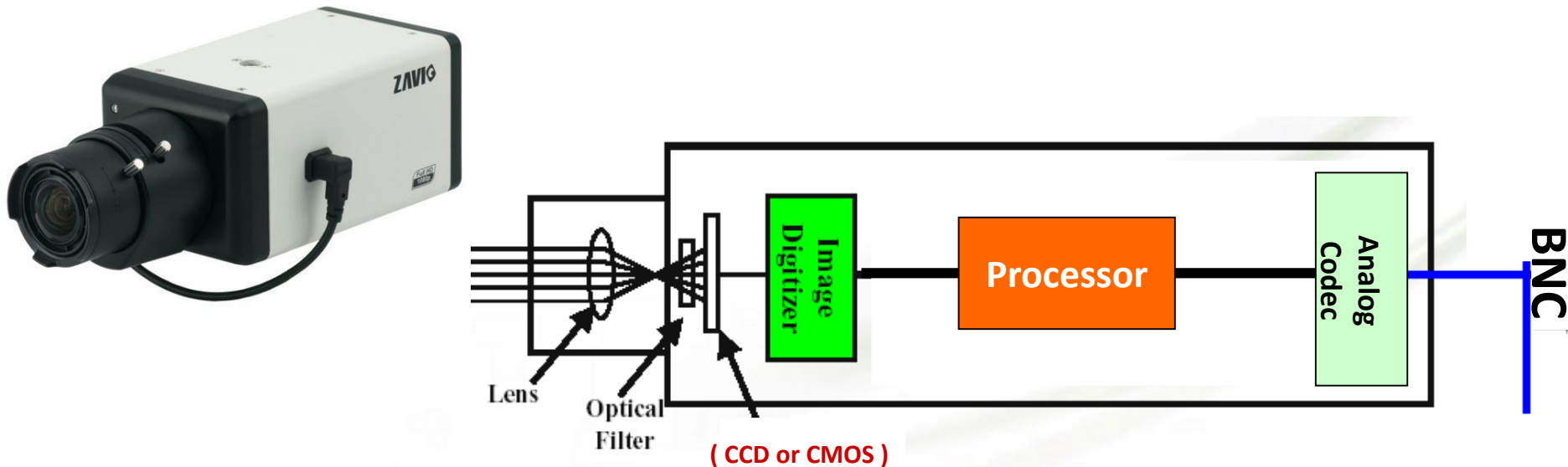
- Internet Camera
 - With its own or assigned IP address enable users to monitor and configure it (with authorized access) at anywhere/anytime



Components of CCTV System

- BNC CCTV Camera

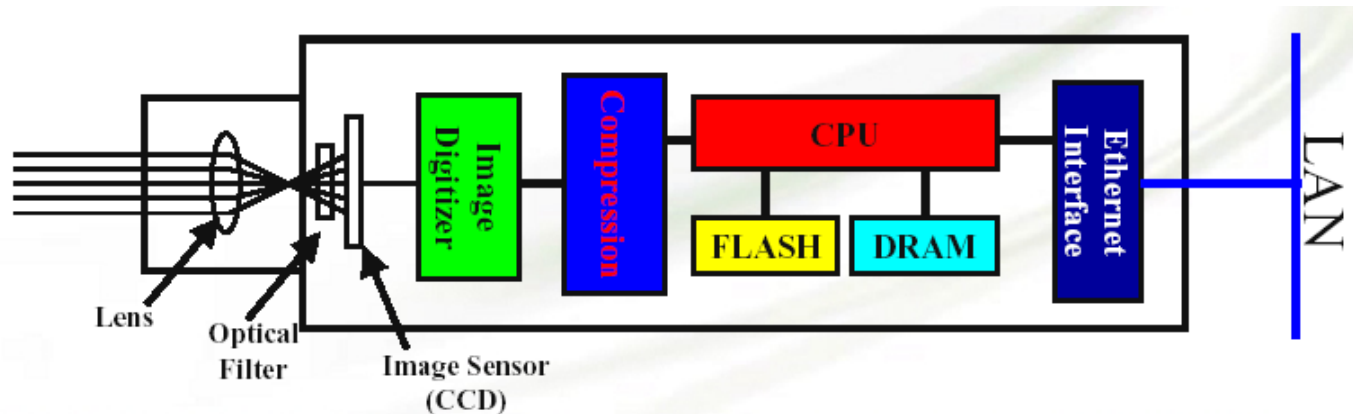
- A CCTV camera including lens, optical filters, image processor and analog codec with coaxial Cable (BNC) interface.



Components of CCTV System

- IP CCTV Camera

- A IP camera including lens, optical filters, image processor and server with networking interface - LAN or WiFi.



Components of CCTV System

- IP Camera vs CCTV Systems

CCTV



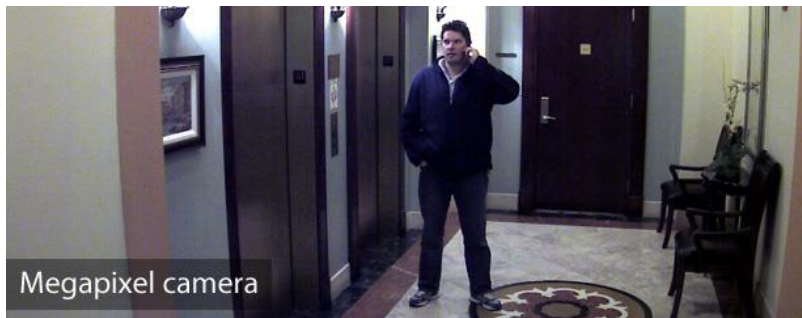
IP Camera



Components of CCTV System

- IP Camera vs CCTV Systems

CCTV



IP Camera



Type of camera and their Use



- **Pan Tilt & Zoom or PTZ camera.**

- Best suited for patrol duty and open area application – Like border, Airport, Parking etc.
- When we want live control of the camera and adjusting the manual pan, tilt or zoom a fixed camera isn't practical;
- When a tour of the premises is required;
- When several angle is required to be viewed from a single camera.

Type of camera and their Use



Type of camera and their Use



- **Dome Camera.**

- When the camera is within someone's reach domes cannot be easily manipulated or vandalized;
- Dome can accommodate infra-red for night vision;
- Domes are not always weather proof cameras so these are not suited for outside peripherals;

Type of camera and their Use



- **Box Camera.**

- When mounting to a wall or any vertical area;
- When extreme low light (moon light or very far street light) are not considerable;
- Comes with WDR and Day Night technology;
- Can incorporate various lens;
- Required a housing for weather proofing and vandal proofing.



Type of camera and their Use



- **Infra Red or IR Bullet Camera.**

- When the lights are extremely low or pitch dark;
- The distance infra red can see are based upon its illumination capacity;
- When ever a infra red is illuminated it turns the picture to B/W hence reducing the ability of recognition;
- These came have an advantage of in build IP 66 rated housing and comes with stand.

Components of CCTV Cameras

- **Type of Lens:**
 - Fixed;
 - Variofocal.

Fixed Lens

- Fixed lens are those lenses, where lens size doesn't change, all we can do is focus, we can't zoom in or zoom out.
- Common sizes are:
 - 12 mm;
 - 08 mm;
 - 06 mm;
 - 04 mm;
 - 3.6 mm;
 - 2.8 mm.



Varifocal Lens

- In Varifocal lens size can be changed during the installation process & Zoom in and Zoom out is possible.
- Common sizes are:
 - 2.5 mm ~ 8 mm;
 - 3.0 mm ~ 12 mm;
 - 5.0 mm ~ 50 mm.



Varifocal Lens

- Focal length can be adjusted by 3 methods:
 - Manual (No cable)

To be used only indoors and where the lighting condition is always the same
 - Auto iris (With a cable)

Adjust automatically to allow more or less light to be received by the CCD chip in the Camera
 - Motor Zoom (With a cable & telemetry receiver is needed).

To be found mostly with Pant and Tilt systems, the zoom & Focus can be manually controlled

CCTV Cameras

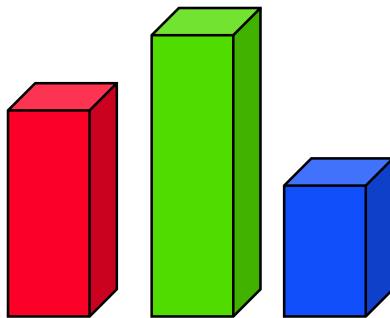
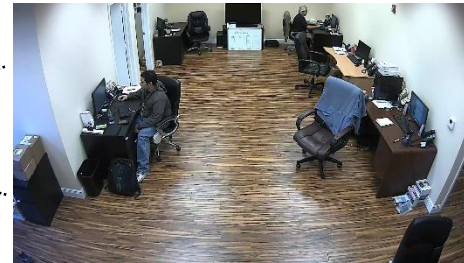
- **Main parameters and characteristics:**
 - The size of the CCD or CMOS matrix;
 - Compression standards;
 - Sensitivity;
 - White Balance;
 - Back Light Compensation;
 - Wide Dynamic Range;
 - Electronic Shutter.

CCTV Cameras

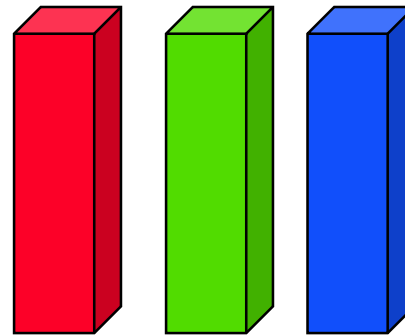
- **Compression standards:**
 - **JPEG** - Still image compression;
 - **MJPEG** - Motion JPEG, sequence of still images;
 - **JPEG 2000** - More efficient than JPEG;
 - **MPEG2** - Used to high quality video, DVD;
 - **MPEG4** - More efficient than MPEG2;
 - **H.264** - After H.263 used for video conferencing, great for even lower bit rates.

CCTV Cameras

- **White Balance:**



Levels Unbalanced



Levels Balanced

CCTV Cameras

- **White Balance:**



Before



After



CCTV Cameras

- **Back Light Compensation (BLC):**

Too dark indoor images



Too bright external images

CCTV Cameras

- **Wide Dynamic Range (WDR):**



Without WDR



With WDR

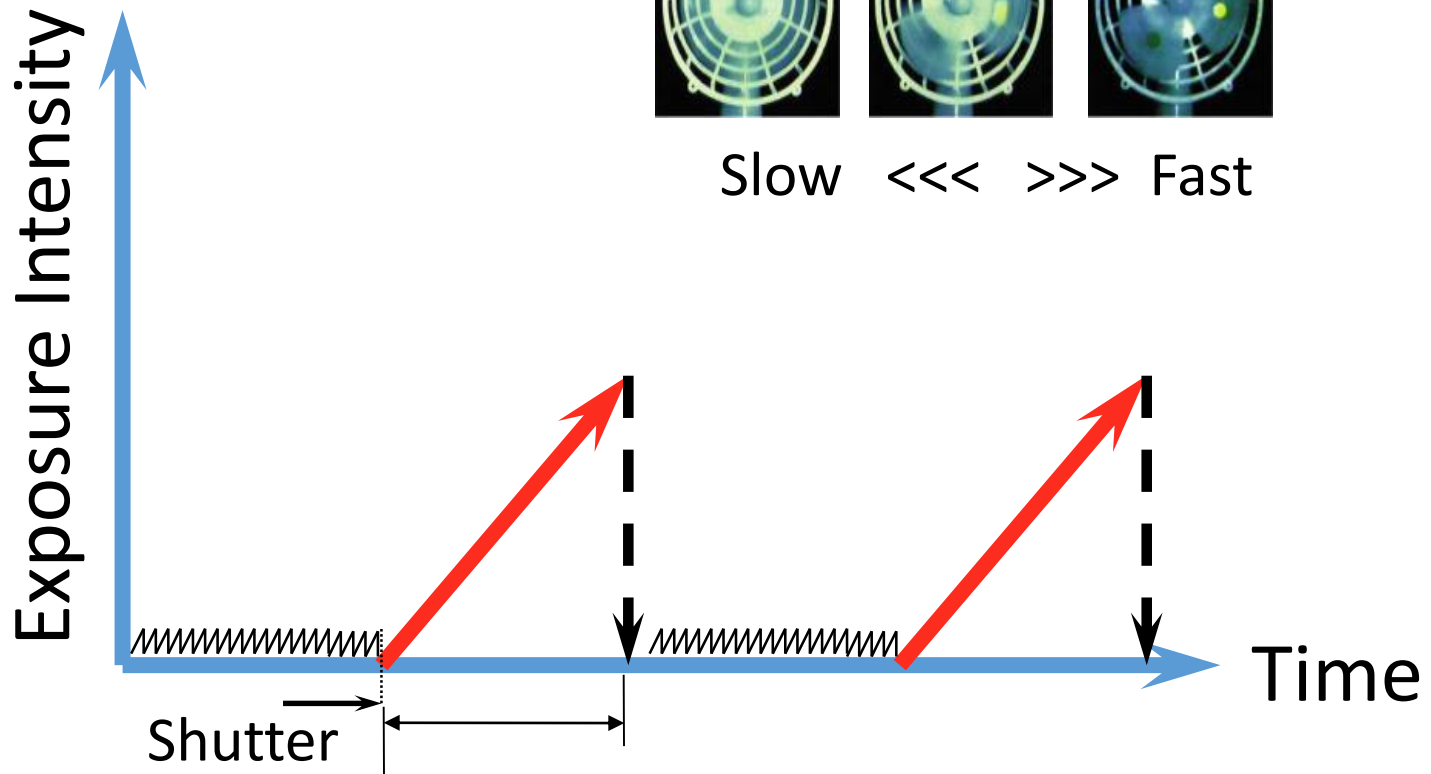
CCTV Cameras

- **Electronic Shutter:**

- Conversely, if shutter speed is 'slowed', the more light is accumulated on the sensor;
- Slow shutter produces clearer images in low lit areas, BUT Motion in the scene would be a 'blur';
- High speed shutter - Allows clear capture of high speed objects.

CCTV Cameras

- **Electronic Shutter:**



CCTV Cameras

- **Main parameters and characteristics:**
 - Day & Night ;



Network selection

- Select CCTV network based upon:
 - Need for centralised monitoring/recording or stand-alone cameras;
 - Existing network infrastructure (optical fibre/copper/wireless);
 - Ownership of assets (lighting poles, power poles);
 - Distance between cameras and recording/ monitoring site;
 - Potential system growth or reorientation.

Camera selection

- Select camera based upon:
 - Areas requiring coverage, level of detail and resolution;
 - Distance from camera to target area, and streetscape;
 - Environmental conditions (e.g. hot/humid; cold/icy);
 - Vandalism risk – appraise threat, choose solution;
 - Whether operational use by police or council required;
 - Planned system life, durability and upgradability.



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IP video surveillance systems

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Hallway at School



- Semi-outdoor environment;
- Need to **monitor the people walking and staying on the hallway**
- Need recording both in day and night

ACM-1231



IP 66
Casing

- Water proof & dust proof
- Weather proof -20~50°C
- No need extra casing for the semi-outdoor installation

Vary-focal
Lens

- f3.3~12mm / F1.4mm
- 89.8° ~ 23.9° (Horizontal)
- Fit different demand of monitoring

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- See the student's face clearly

PoE

- Power over Ethernet
- Easy to install, no need extra cabling along the hallway

Cut filter &
IR LED

- IR LED X24, (850nm) support to 0 Lux
- Clear video at night

Computer Lab at School



- Indoor environment;
- Need to **monitor the students in the lab;**
- Need continuous recording at day and event recording at night

ACM-3311



Dome
Type

- 3" dome type
- Can hide in the ceiling, no pressure to students

Day/Night
IR Led

- IR Led X12 (850nm), supported to 0 Lux
- Keep monitoring at night even when the light has been turned off

3-way
Audio

- Built-in two way audio
- Integrate with broadcast system, the control center can stop students from breaking the norm immediately

PoE

- Power over Ethernet
- Easy to install, save extra cabling in the computer lab

ACM-7411



Vandal Proof

- Durability to 619 KgF
- Prevent to be broken by violence

Megapixel Resolution

- 1280*1024 resolution
- Over 800TVL
- Can see the monitor of computer, knowing what students are doing

Mechanical IR Cut Filter

- 0.05 Lux at F1.0
- Clear and clean video at low Lux

Camera Angle adjustment

- Panning: 0° ~360°
- Tilting: 0° ~180°
- Rotating: 0° ~360°
- Easy to adjust and can be mounted on the wall

Entrance of Retail / Restaurant



- Semi-outdoor environment;
- Need to **monitor the people getting in and getting out of the store;**
- Need recording both in day and night

ACM-1431



IP 66

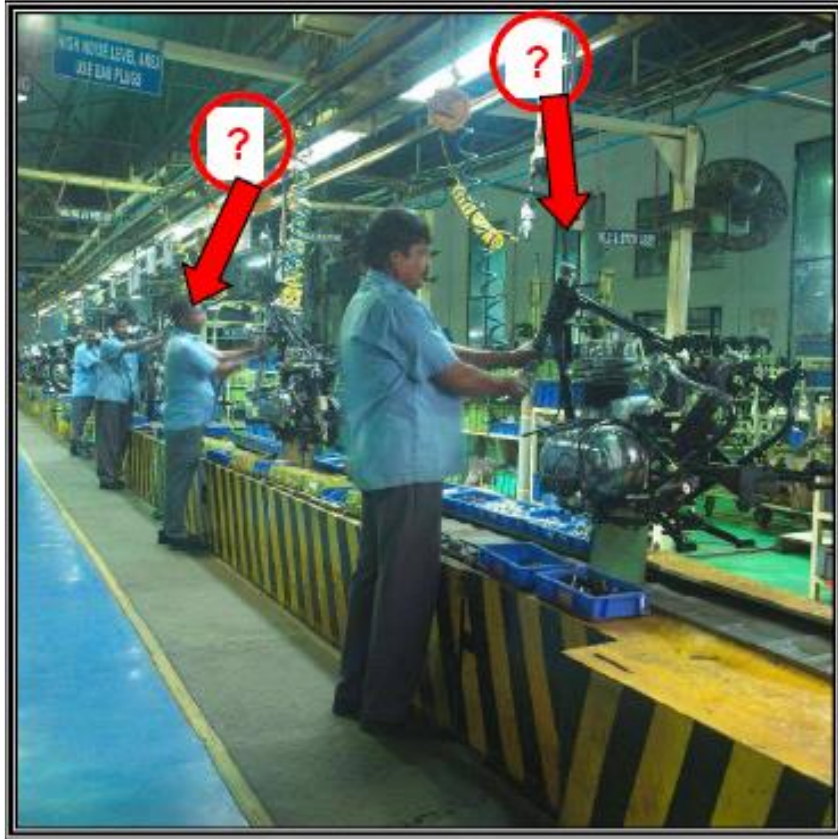
CCD
Sensor

MIR Cut
Filter

PoE

- Water proof & dust proof
- Weather proof -20~50°C
- No need extra casing for the semi-outdoor installation
- 1/3" Super HAD CCD
- Suit the complicated and always changing light in the entrance
- IRLEDx15, 850nm, support to 0 Lux, with IR LED on
- Clear video even when there is no lighting
- Power over Ethernet
- Easy to install, don't need to worry about the power cable over the entrance

Factory's Production Line



- Indoor environment;
- Need to **monitor the workers doing the operation accurately;**
- Need recording for 24 hours a day.

ACM-4200



2-way
Audio

- Built-in 2 way audio
- Integrate with broadcast system, can correct the wrong operation immediately

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- See each action clearly

Changeable
Lens

- 4.2mm Free bundled megapixel lens
- Variable lens (optional)
- Suit different application

Competitive
Price

- Low cost cube camera
- Solve the budget concern of huge channels installation

Factory's Warehouse



- Indoor environment;
- Need to **monitor the movements on each aisle;**
- Need recording for 24 hours a day.

ACM-7321



Vandal
Proof

- Durability up to 619 KgF
- Prevent the possible crush with trucks or goods

IP 66

- Temperature resistant -30~50 °C (PoE-5~50 °C)
- Water Proof and Dust Proof
- Can see the monitor of computer, knowing what students are doing

D/N
Function

- Min. Illumination: 0.05Lux at F1.2
- Keep monitoring at night

Vari-focal
Lens

- f=2.9~10mm/F1.2, Auto Iris
- Suit different application demand

ACM-8211



1.3
Megapixel

- SXGA 1280x1024
- Over 800TVL
- See each stock clearly

PT +
e-Zoom

- Pan: 0° ~354 ° , Tilt :-30°~90°
- E-zoom
- Can set patrol tour

Mechanical
IR Cut Filter

- IR LEDx3, 850nm
- Clear view at night, support to 0 Lux

Competitive
Model

- Bundle PTZ + Megapixel + Mechanical IR cut filter
- Suit different application demand

Surveillance in Retail Store



- Indoor environment;
- Need to **monitor the movements in whole store;**
- Need recording for 24 hours a day.

ACM-4200



Cube Type

- Cube type design
- The look is compatible with the wall and retail store

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- Can see the bar code of goods

Changeable
Lens

- 4.2mm Free bundled megapixel lens
- Variable lens (optional)
- Suit different application

Competitive
Price

- Low cost cube camera
- Fit the tight budget of retail store

ACM-8201



1.3
Megapixel

- SXGA 1280x1024
- Megapixel PTZ Cam
- See each item clearly

PT +
e-Zoom

- Pan: 0° ~354 ° , Tilt :-30°~90°
- E-zoom + absolute position
- Track unusual activities & provide patrol tour

PoE

- Power over Ethernet
- No extra cost for cabling

Competitive
Model

- PTZ camera + megapixel resolution
- Suit different application demand

Cash Counter in Bank



- Indoor environment;
- Need to **monitor the staff's actions at cashier;**
- Need recording for 24 hours a day.

ACM-4200



2-way
Audio

- Built-in 2 way audio
- Prevent the employee conspire with the fake customers

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- See the money amount

Changeable
Lens

- 4.2mm Free bundled megapixel lens
- Variable lens (optional)
- Suit different application

Competitive
Price

- Low cost cube camera
- Fit the budget concern of big scale installation

ACM-5611



2-way
Audio

- Built-in 2 way audio
- Prevent the employee conspire with the fake customers

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- See the money amount

C/CS Mount

- 4.2mm Free bundled megapixel lens
- Variable lens (optional)
- Suit different application

Mechanical
IR Cut Filter

- Mechanical IR cut filter
- D/N with 0.1 Lux
- Clear view at night

Office



- Indoor environment;
- Need to **monitor the staff's actions inside the office;**
- Need continuous recording for day and event recording at night.

ACM-3311



Dome
Type

- Discrete 3'' dome type
- Can hide in the ceiling, no pressure to employees

Day/Night
IR Led

- IR Led X12 (850nm), supported to 0 Lux
- 24 hours protection to the office even when the light is off

2-way
Audio

- Built-in two way audio
- Integrate with broadcast system, record the conversation of employees in case of divulging business secret

PoE

- Power over Ethernet
- Save the trouble of cabling

Indoor Parking Lot's Entrance



- Semi-Indoor environment;
- Need to **monitor the incoming car when it stopped at gate;**
- Need recording for 24hours a day.



ACM-1431



IP 66

- Water proof & dust proof
- Weather proof -20~50°C
- No extra casing is needed

CCD
Sensor

- 1/3" Super HAD CCD
- Suit the complicated and always changing light

Vari-focal
Lens

- f3.3~12mm / F1.4mm
- Fix different applications of monitoring

PoE

- Power over Ethernet
- Easy to installation

Excellent
D/N
Function

- Mechanical IR cut filter
- IR LED x15, 850nm
- Monitor the incoming car even in 0 Lux

Intersection Surveillance



- Outdoor environment;
- Need to **see car plate of each car at intersection clearly;**
- Need recording for 24 hours a day.
- Due to budget concern, end user requires to use **fixed camera only**

ACM-1231



IP 66
Casing

- Water proof & dust proof
- Weather proof -20~50°C
- Don't need to pay for outdoor casing

Vary-focal
Lens

- f3.3~12mm / F1.4mm
- 89.8° ~ 23.9°(Horizontal)
- Fit different demand of monitoring

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- Can see the car plate number

PoE

- Power over Ethernet
- Easy to install, no need extra cabling in the road

Cut filter&
IR LED

- IR LEDX24, (850nm) support to 0 Lux
- Can see the car plate number even at night

ACM-6610



IP 66

- Water proof and dust proof
- Temperature resistant: -45°C~50°C
- Indoor/Outdoor application

Speed
Dome +
Zoom Rate

- 23x optical; 12x digital zoom rate
- With NVR Absolute Position, can monitor the unusual event efficiently

CCD
Sensor

- 1/ 4" Sony CCD sensor
- Mechanical IR Cut Filter
- Suit the complicated and always changing light and keep monitoring at night

Preset
Points

- 256 preset point
- Meet the patrol demand

Airport



- Indoor environment;
- Need to **monitor the people who are passing the boarding gate;**
- Need recording for 24 hours a day.

ACM-5611



2-way
Audio

- Built-in 2 way audio
- Integrate with broadcast system for recording the passengers conversation

1.3
Megapixel

- 1280*1024 resolution
- Over 800 TVL
- See the passenger's face clearly

Changeable
Lens

- 4.2mm Free bundled megapixel lens
- Changeable lens
- Fit different application

PoE

- Power over Ethernet
- Easy to install

ACM-5321



CCD Sensor

- High sensitivity of light
- D1 Resolution at full frame rate
- Clear and stable video output

2-way Audio

- Built-in two way audio
- Integrate with broadcast system for recording the passengers conversation

Changeable Lens

- Changeable lens
- Fit different application

PoE

- Power over Ethernet
- Easy to install

Transportation-MRT Station



- Indoor environment;
- Need to **monitor the people who are passing the boarding gate;**
- Need recording for 24 hours a day.

ACM-1431



IP 66

- Water proof & dust proof
- Weather proof -20~50°C
- No extra casing is needed

CCD
Sensor

- 1/3" Sony Super HAD CCD
- Suit the complicated and always changing light

Vari-focal
Lens

- f3.3~12mm / F1.4mm
- Fix different applications of monitoring

PoE

- Power over Ethernet
- Easy to installation

MIR
Cut Filter
IR LED

- Mechanical IR cut filter
- IR LED x15, 850nm
- Clear view at night, support to 0lux



InnoSoc

Innovative ICT Solutions
for the Societal Challenges



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