Traffic Control

Traffic Information

City Hall Information

video surveillance

Parking

Smart City
Fiction Becomes Reality

The look of a future city has been pictured for so many times in some immortal literary and cinematic works of the 20th century. Whether a Utopia or a Dystopia, they all let us speculate which technological capabilities the future might hold. By the revolutions of technology and network of the last few decades, we are now witnessing the fiction becoming a reality. Cities are covering themselves with all kinds of "sensors" and "detectors". And the concept for a town to use information and communication technologies (ICT) to manage its infrastructure is getting popular among urban developers.

Goals

According to a research of UNFPA, more than half of world population is living in urban areas, and the population is still rising. As urban population grows, urban life faces many challenges, such as scarcity of resources, traffic jams, air pollution, lack of infrastructure, weak law enforcement, and so on.

As a city must ensure livable conditions for residents, it sees the needs to be intelligent and efficient in delivering services. Luckily, as technology advances and gets inexpensive, cities learned to uses technology to automate municipal services. Smart City becomes a strategy to mitigate the problems.

Potential market

According to **Frost & Sullivan**, Smart Cities are likely to create more than $ 1 trillion markets by 2020, ranging from smart building, smart transportation, smart energy to smart security.

Public Safety & Video Surveillance

Crowded Detection

LPR

Car Counting

Left Object

The most critical issue of a Smart City is to maintain public safety because life and happiness are the groundwork of the much-affirmed concept of human rights in modern history. Also, security will attract the investment, business, and skilled labors required for the development and economic growth of a city. However, as a municipality ushers in economic growth, it also becomes the home of crimes.

Video cameras first emerged in the 1940s. They weren't used for crime prevention until the 1970s and weren't spread wide across the US until the 1980s, whereas they were installed in retail stores to deter crimes. Into the 1990s, the trend of video surveillance has changed from analog to digital with several waves of technological revolutions that followed.

The evolution of security cameras thru the years:

	Yeasterday	Today
Data transmission	**Analog**	**Digital**
Recording resolution	D1 resolutions, 25fps @D1 1.6Mb	2M resolutions, 25fps @D1 1.6Mb
Continuous recording	2 weeks	4 weeks
Storage requirement	280GB	2300GB
FPS	25	25

As the trend shifted from analog to digital, the way cities built video systems also changed.

What a city wants from a video system

Comprehensive protection

A big city needs comprehensive protection with no blind spot in these places: **1.) public grounds**, **2.) buildings & complexes**, and **3) public transportation systems**.

Not only in the permanent public places but also in mass vehicles such as subway trains, buses, etc. is protection needed.

A video system that also works on moving wheels is what a city needs. The video system must run 24x7 reliably.

Powerful central platform

To blanket a city, about 400 to 10,000 cameras are needed, a myriad that must rely on a centralized platform capable of non-stop video recording for at least 1~6 months. Therefore, the video system should have excellent video write at high speed on a 24x7 basis, and, the storage and writing bandwidth need to be 5 to 10 times bigger than average enterprise products.

Powerful alarma are also a must. It's quintessential that the control center receives an alarm within a few minutes or even shorter. Video retrieval must be ready, quick, and simple even from a massive video archive.

An ideal video system must be ready to take in a 3rd-party system and capable of sharing files with other municipal organizations or departments. The technologies must be inexpensive and be affordable for city budget.

AI & big data

With digital technologies, such as AI and big data, a city can draw accurate predictions from a huge trove of data, and, therefore, improves its operations, develops new measures, and provides better services, at a lower cost.

For example, AI and big data can run analytics to improve traffic and, most essentially, prevent crimes.

How GVD meets city security challenges

Video walls

GVD brings video walls to your command center. A video wall with dozens of synchronous live videos on multiple monitors can help city mayors quickly cover as many situations as possible going on in a small corner of his/her city. Despite vast video traffic, the video quality needs not to be compromised since GVD **Central Management Solution** uses a variety of techniques to optimize live video streams, and the management software features an enhanced tool to manage the video wall

Command center

GVD solution includes a command center. Through network, an NVR can stay closely connected with the command center wherever the NVR is. A city's security operators can real-time monitor a public facility afar, and police or medical institutions can react without delay to a crucial event, even if the event takes place on a train or bus.

Powerful alarms

GVD NVR comes with a powerful **Rule Wizard** to define which conditions to launch an alarm and which reactions to take, with high degrees of customization for users. The condition can be a critical hardware state such as CPU overheat or a channel state such as video loss.

IBM IOC

IBM *Intelligent Operations Center* integrates disparate and diverse systems into one engine, including video systems. GVD **X7** provides a full access to the *IOC*, a software with an executive dashboard that depicts the overall status of a city's various agencies, such as civil affairs, fire, police, air ports, road/traffic, etc.

The *IOC* takes in data from the sensors dotted around the city and monitors status, reports, tracks incidents, and alerts the right people of anything abnormal. And, the *IOC* has a powerful analytics tool to draw insightful conclusions from the received data and, therefore, improves civil services.

Rich product portfolio for a city's needs

Central Management Platform

GVD **Central Management Platform** is designed for large projects. It supports failover and backup of video data and features an integration gateway to accept 3rd-party systems. It also brings a command center and video walls. It also works with some business machines such as POS and ATM, with sophisticated VCA and alarm.

A variety of NVRs

GVD has a variety of NVRs to perform various heavy duties, including high-capacity **True Enterprise M6 Series**, **Fanless and Mobile M1 Series**, and the new 4K **M41 Series**.

Cloud Data Servers

The **X7** is a *"Cloud Data Server"* supporting **IBM** *Intelligent Operations Center*, a software that integrates a city's various systems into one. The **X9**, as a *"Duel-controller Network Storage System"*, handles thousands of video streams from the **X7**, supporting up to 500 pieces of 10TB HDD.
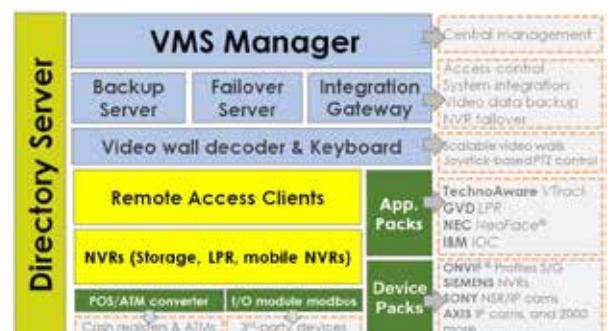

Quick expansion

GVD*'s* quick expansion of system requires no change to the existing NVRs and application programs.

GVD's *Central Management Platform* can vertically swell with more NVRs, video walls, redundant servers, etc, and horizontally grows as more "*plug-ins*" are thrown in. A "*plug-in*" is a software pack of a new feature, including a 3rd-party one, such as POS, LPR, BAS, AI, Facial Recognition, ACS, alarms, etc.

Currently GVD has an LPR pack, a VIT LPR pack, a **TechnoAware Vtrack** pack, and a bi-monthly released "*device pack"* to support new cameras.
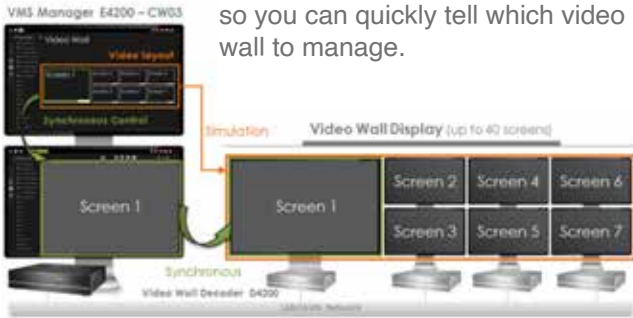
System Highlights

Synchronous video-wall control

GVD features "Synchronous video-wall control", which means your operation at the central management console is promptly applied to a remote video wall. You can drag-and-drop a video to output it on a remote video wall, or drag-and-drop a video pattern to change the video layout on a remote video wall. All video walls on the UI can be freely relocated onscreen to reflect their real location on-site so you can quickly tell which video wall to manage.

Smart Keeper

GVD's central management software **VMS Manager** features a dedicated page to show how many devices are there in the system and how they are working at the moment. The page is an efficient overview in a organized and classified way. 11 device types are supported, including camera channels, NVRs, DIO modules, doors, video wall displays, directory servers, failover servers, backup servers, station servers, etc. A "Smart Keeper" detects and adds an available device to the system. It also updates the status change of a device automatically. This "Smart Keeper" lessens the complexity of setting up and managing a large-scale video system.

Case Builder

A tool that systematically inquires into a suspicious event on your business floors. You can document each your investigating act with an "Investigation Note", supported by a text description, video clip, or a screenshot attached, and these notes can further be stored in an "Investigation List", which then forms an organized documentation of your investigation on a case. In some worst conditions, it provides you with the evidence required for criminal investigation.

Facility map & GIS map support

The central management software **VMS Manager** supports "facility maps" and **GIS Maps** to truly mitigate the complexity of large-scale IP video surveillance across a city or nation.

A facility map

GIS map

TechnoAware VTrack & NEC NeoFace®

Traffic and crimes are two major problems of modern urban life. GVD fixes them by embracing two cutting-edge technologies, **TechnoAware**'s Vtrack and **NEC** Neoface®.

GVD system can be plugged in with **TechnoAware**'s Vtrack to detect intrusion, gate flow, LPR, the average speed of a vehicle, human faces, and many others. GVD system also integrates with **NEC** Neoface®, the currently most precise face-recognition engine in the world, to check a face in the crowd against a black list and decide whether it belongs to an individual with illegal records.

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System highlights

Adaptive Video Streams

Adaptive Video Streams is a technology for a viewer to stream not necessarily the high-profile main stream but possibly the low-profile sub stream as long as the size of the viewer is small enough to compensate for the low-profile video quality, which poses a great help for video display in poor network conditions. The central management **VMS Manager** lets users enable/disable this feature for an individual viewer and lets users define a platform-wide limit on the viewer size to give up this feature to make the feature more flexible.

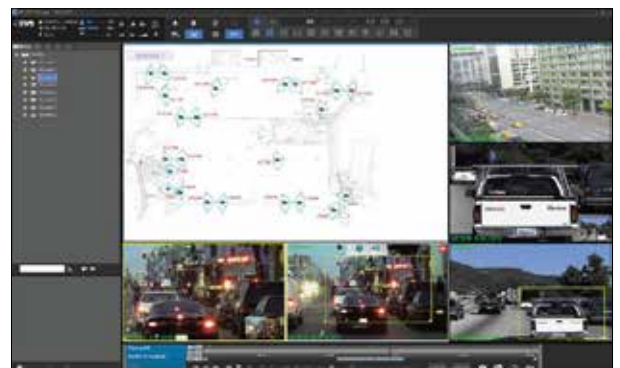

Panoramic fish-eye dewarp

The central management **VMS Manager** lets you dewarp a distorted video from a panoramic fish-eye camera when you are managing a video wall, video-documenting an investigation, or conducting local monitor if the video doesn't get dewarped by GVD **HD NVR**.

Dewarp a distorted video with panoramic filters

Nonstop video live-streams & playback

GVD central management solution not only includes redudancy such as failover and backup but also breaks through the limit of failover with "Edge recording", in that a GVD NVR automatically reduplicates the video data stored in the SD or memory of a camera after video recording task fails back onto the NVR. Video live-streams and playback won't be interrupted with such "Edge recording". This feature is much helpful for a broken network and also better protection of video data.

Tag management

The cental management **VMS Manager** comes with a unique and very useful "Tag Management" to let you efficiently spot one particular channel among a large group of them. The "Tag Management" relies on a virtual label attached to a channel to be quickly screened from a big group of online ones.

Powerful SW-E2200-CW03 bundled

A software program SW-E2200-CW03, i.e. "CMS Manager", is pre-installed with the central management software **VMS Manager** to bring a full remote configuration tool of NVRs and cameras. This "CMS Manager" also enables advanced video operations including synchronous playback and optimized video display, as well as sophisticated video computing such as **Video Content Analysis** and advanced metadata search.

"*CMS Manager*"

System architecture

Cloud Data Storage

SH824
Cloud Data Storage Servers

SH824
Cloud Data Storage Servers

Command Center

iSCSI

iSCSI

Ins: NVR
Ins: NeoFace
Ins: VTrek
Ins: IBM IOC
Ins: DDS

Instance

Ins: Failover Svr.
Ins: Backup Svr.
Ins: NVR-C064
Ins: NVR-C064

Instance

H8208
Cloud NVR
& computing engine

E4200
Control Workstation

D4200
Video Wall Decoders

E90
PC thin client

LAN
CAT6 Switch

WAN

VPN

Cameras

Cameras

ATM

PC with
SW-E2200-CW03

Mobile phones/
tablets
Android/iOS clients

NVR

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