International Journal of Advanced Information Science and Technology (IJAIST) ISSN: 2319:2682
Vol.5, No.7, July 2016 DOI:10.15693/ijaist/2016.v5i7.58-61

SURVEILLANCE CAMERA ON CLOUD - CLOUD INTERNET STREAM RECORDER

Dr. Vanishree Pabalkar
Assistant Professor
vanishree.p@sims.edu
Symbiosis International University

Mr. Rajkumar GVerma
Network Administrator
Rajkumar.v@sims.edu
Symbiosis International University

Abstract-Surveillance camera is used for recording on a continuous basis through 24/7. This enables one to trace the recordings of a specific incident that could have taken place in the past. This therefore acts a strong tool of witness for specific cases. The records, Hardware and Software obtained through these surveillance cameras are under the control of the Local bodies in the respective areas. Due to limited accessibility of Hardware through local bodies, the real time monitoring process does not actually happen. Therefore the need arises to put up the surveillance cameras on cloud, which would ensure the accessibility of the hardware from any given location. This can curtail many mishaps.

Cloud Internet Stream Recorder functions similar to a Network video recorder. The line of difference sets in with the use of Hadoop file system and Map reduced technology. NVR and DVR technologies have become redundant, rather the process is faster and live through HDFS and map reduced functionality. With NVR and DVR, the image, video, audio and data streaming process which was a multi-layered with multiple devices.This process can be developed and escalated to the latest technology, wherein, the data streaming happens through cloud internet stream recorder with multi-layered and through a single device. This process requires changes in the network technology like file compression, image processing, encryption, web services etc. This would be on Network through HDFS and map reduced functionality.

CLOUD INTERNET

Cloud Internet provides shared processing resources, shared distributed storage and data to computer and other network resources on demand. This is open to all public through cloud computing.

The records of the surveillance cameras on cloud would help one in understanding the issues or problems accompanied with the incoming and outgoing traffic for a given area. These loopholescan be cut down and can be seen on real time by controlling authorities though the access of Smartphones. Disaster Management can therefore be successfully monitored through appropriate use of surveillance cameras. These surveillance cameras, when put up on cloud, provide access to the Controlling authorities, irrespective of the location where they are present.

When the surveillance cameras are put up on cloud, there is a possibility to eliminate many Hardware, thereby leading to cost saving and will bring down the e-wastage. This will eventually benefit the Controlling authorities. If the surveillance cameras, are on cloud, it would benefit certain Sectors prominently, like the Security services, Hospitals, Aviation industries, Railways, Educational Institutes, Banks, or any other area of where there would be people commuting in a large number. With the help of surveillance cameras on cloud, the real time monitoring of route optimization and the shortest route path can be determined. This therefore creates the need for adding the surveillance cameras on cloud enabling the Controlling authorities to monitor and investigate into the minute details of a specific case via Intercity or Interstate. This can enhance the connections between two locations, at any remote location at any given point of time.

The current study discusses the significance of CISR, when surveillance cameras are put on to cloud. The functions and aspects using CISR over NVR and DVR has been dwelled in detail by the researcher.

KEYWORDS: surveillance cameras, Hardware, Controlling authorities, cloud computing, Cloud Internet Stream Recorder (CISR)

INTRODUCTION

SURVEILLANCE CAMERAS - TYPES

Surveillance cameras are of two types: Analogand Digital. While Analog is the conventional model, which was assembled through lenses and had a digital video recorder. This had its own set of limitations like the maintenance cost was very high. This was a recurring cost. The recordings through this Analog surveillance cameras would capture huge amount of disc space. Therefore witnessing a specific incident would take longer with this technology. Digital surveillance cameras would occupy comparatively lesser disc space and would directly route to the specific case and would therefore save on time.

SURVEILLANCE

This is a monitoring technique that detects the movement in a specific area. In Conventional times, we had physical entities doing this task. Then came Microphones, wherein it could capture voice. Then Sensors came in picture clubbed with Microphone to capture an undetected object, through Voice.Then came the Binoculars and Telescopes that could capture the movements of a specific distance from a distant location through naked eye. All these technologies had few loopholes, since they had some or the other problem with Surveillance. Then were the Close Circuit Television, CCTV, which enables one to capture the scenarios on a real time basis. CCTV technique was launched in the market through Analog technology. Analog Technology allows to capture the scenarios through multiple cameras, through Digital Video Recorder, DVR. DVR converts the scenarios into Digital data and the multiple views are therefore visible as Single view. Through DVR the scenarios can be connected through a Projector,TV,Display Unit system to watch a Single view.

ANALOG CAMERAS

Images that are captured function based on Analog technology. The demerit here is that it cannot convert the image into digital mode. Therefore DVR set up boxes are needed in such cases. This was a conventional method through which the image captured was restricted and the storing capacity space was abundant.

IP CAMERA

Images that are captured function based on Digital technology. The merit here is that it can convert the image into digital. Through IP the image gets transferred to Network Video Recording. (NVR) This is the updated method through which image captured is not restricted and the storing capacity does not occupy abundant space.

The latest technology that is available in this is H265 protocol. This can transfer data through High Throughputs.

CLOUD NETWORKS

The number of Networks that are on open source and are interconnected with each other. The Data redundancy, back up redundancy, route redundancy, route optimization etc. are available on Cloud Networks. This is a Network that functions on a continuous basis. This would one to capture the Data flow on a continuous basis. All these are facilities that are available only on Cloud Networks.

For instance the Network in a city which is Wide areas Network. If number of Wide area networks are merged, starts as continuous process, we can form a Cloud Network. This would prove to help in capturing the images of one city/place with that of another simultaneously. The surveillance cameras of one city and that of another city can be viewed at a common place through Cloud Networking. Cloud Networking would prove to be of great benefit, provided all the technological support is provided and the Real time monitoring process can be conducted through surveillance cameras.

CLOUD COMPUTING

When surveillance cameras are put on cloud, the latest technologies would be aptly used. For instance, multiple storage and multi locations, multiple cities and multiple territories, can all be captured at one go. This would prove to be significant after segregation through Big Data Hadoop technology. Hadoop technology has a USP in Map reduced functionality and Distribution file system (HDFS). For instance, in the real time streaming of one city and the streamlining of another city, the actual NVR and DVR system would undergo change and would give rise to a totally new system called "Cloud Internet Stream Recorder"(CISR) .This is possible through HDFS& MAP-Reduce :Hadoop.

Standard flow of Camera Working Process

IP Camera➔>LENS ➔>CCD/CMOS ➔>ADC ➔>DSP➔>NETWORK SWITCH➔> NVR

Analog Camera➔> LENS➔> CCD➔>ADC ➔>DSP➔> DAC➔>DVR

IP Camera -DSP (Image Processing, compression, encoding, web server, IP protocol, Conversion)

Analog Camera - DSP (Image Processing) Rest of function All-do DVR

Coupled Charge Device (CCD)

Complementary Metal Oxide Semiconductor (CMOS)

DSP-> Digital Signal Processor

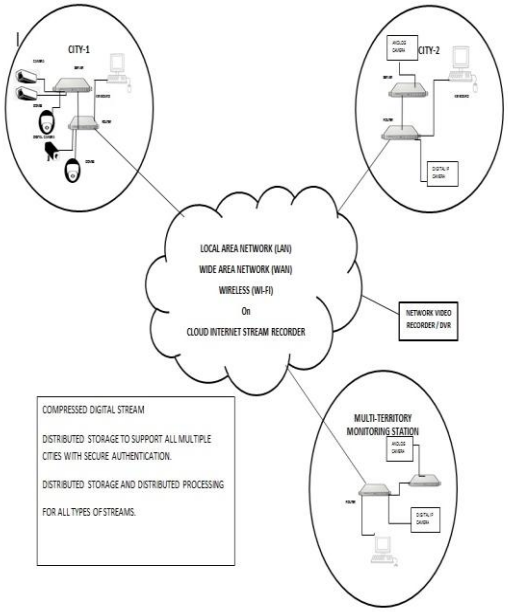
ADC - Analog to Digital converter

DAC - Digital to Analog converter

DVR-Digital video Recorder

NVR-Network video Recorder

Fig.1: SURVEILLANCE THROUGH CISR ON MULTIPLE TERRITORY



CONCLUSION

If the information ofsurveillance cameras is available on cloud, with real time accessibility like the traffic of a city or the camera records that are real time records, there could be lesser chances of system getting vulnerable. The communication process would get faster with the surveillance cameras going on cloud. The information could reach at a much faster pace to the concerned authorities, well in time, thus enabling them to trace out the history of the incident accurately. Theaccess to the surveillance cameras were restricted or were limited to the few concerned authorities in the conventional mode, wherein the visibility was not available for the people other than those concerned. But, if the same is put up on cloud, it would ensure that there is more percentage of visibility, thereby there would be larger perspective for a particular incident. For instance, the visibility could

be available on an individual's smart phone, smart watch, PDA or other smart tools. The Smart phones that are enabled with GPS which guides us through the route and can now be behave in a more technical way by way of surveillance cameras. Since the real time information is available through cloud, it would mean leading a much simpler life for an individual to an Organization. The individual can view the different options of routes that he can avail and can select the one that suits him after viewing the real time information of a specific route. Similarly a Hospital would want to perform a crucial operation and may require assistance from another Hospital. The exchange of information is directly possible through the real time information available through surveillance cameras.

LIMITATIONS

The occurrence of a specific mishap cannot be traced accurately until and unless the surveillance cameras are put on cloud. The information, if available on a large scale, each component of the incident can be tracked in detail. This can help to enhance the security levels to a great extent.

Putting the real time information on cloud needs a Internet connectivity with lease line. A policy framework would be needed, which would work under the Central jurisdiction, so that the concerned authorities can easily get access to the real time information through cloud.

Surveillance cameras on cloudleads to abundant cost. The surveillance cameras with accessibility through cloud would act as a great cost factor to an Organization and the budgets are to be separately allocated towards it.

FUTURE SCOPE

The Security agencies, Hospitals, Local and Government bodies can be technically sounder through this surveillance cameras on cloud since they would be exposed to ample information needed for operations in day to day life.

Terrorist movements and plans of attack can be traced and can be acted upon promptly through the surveillance cameras on cloud.

Surveillance cameras would also help in the making of Smart city through Smart safety.

REFERENCES

Hidden Changes: From CCTV to 'Smart' video surveillance,*Joseph Ferenbok and Andrew Clement*

Apache HBase, http://hbase.apache.org

Shi, C. and Bhargava, B., A Fast MPEG Video Encryption Algorithm, ACM International Conference on Multimedia, Bristol, UK, 1998, 81-88.

Towards A Framework Of Contextual Integrity: Legality, trust and compliance of CCTV signage, Mark Lizar and Gary Pooter.

Borgman CL, Wallis J, and Enyedy N. 2007. Little science con- fronts the data deluge: habitat ecology, embedded sensor net- works, and digital libraries. Int J Dig Lib 7: 17–30.

Everywhere: The Global Growth of Camera Surveillance,Aaron Doyle, Randy Lippert, David Lyon

Agi, I. and Gong, L., An Empirical Study of Secure MPEG Video Transmissions, Symposium on Network and Distributed System Security, 1996

Rajkumar g verma *IJAIST ISSN: 2319:2682 Vol.45, No.45, January 2016 "*Big analytics over enormous unstructured & semi-structured multidimensional known-unkown data - The Big Data Hadoop "

Z. Liu, Y. Zheng, E. Hauser, J. Liu, and E. W. Mabry, Secure Internetworking Video Surveillance for DHS Protection Mission, the Department of Homeland Security Conference - Working Together: Research & Development (R&D) Partnerships in Homeland Security, 2005

Thomas Kuo, Zefeng Ni, Carter De Leo, and B. S. Manjunath, Design and Implementation of a Wide Area, Large-Scale Camera Network, IEEE Computer Society Conference on Computer Vision and Pattern Recognition, IEEE Workshop on Camera Networks, Jun. 2010

H. Detmold, A. van den Hengel, A. Dick, A. Cichowski, R. Hill, E. Kocadag, K. Falkner, and D. S. Munro, Topology Estimation for Thousand-Camera Surveillance Networks, IEEE Distributed Smart Cameras (ICDSC), 2007

Limna, T.; Tandayya, P. "Video surveillance as a service cost estimation and pricing model", *Computer Science and Software Engineering (JCSSE), 2015 12th International Joint Conference*

Drew Ostheimer, Sebastien Lemay, Mohammed Ghazal, Dennis Mayisela, Aishy Amer, and Pierre F. Dagba,, "A modular distributed video surveillance system over IP," 2006 Canadian Conference on Electrical and Computer Engineering, CCECE'06, May 7-10 2006

Geovision GV-NVR IP Surveillance Software

http://www.a1securitycameras.com/Geovision-GV-NVR-32-3rdParty-Geovision-NVR-IP-Video-Surveillance-System-32-ch.html,Retrieved 2012.06

.

AUTHOR'S PROFILE:

Dr. Vanishree Pabalkar, a Gold medallist from Pune University, has areas of interest in Marketing Management and Re tail Marketing. She has a blend of Corporate and Teaching experience. Her area of research for her doctoral program is in the Telecom Sector. She is an author for a book on Marketing Research. She is a prolific writer and has presented several research papers in various national and international conferences. She has also expertise in developing case studies in the areas of Marketing Management and Marketing Research.

Mr.Rajkumar G Verma, currently working with Symbiosis International University, SIMS. He received his Bachelor of Computer Science, Bachelor of Education, Master in Computer Management Degree from Pune University, MBA from Chennai Board, Currently doing M.Tech level program from National Institute of Electronics & Information Technology (NIELIT). His research Interest includes Networking & Security, Computer Forensic, Parallel& Distributed Computing, Gesture, Sensor, and Wireless Communications.