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Video Surveillance Using Cloud

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1. ABSTRACT:

A high-resolution video surveillance management system incurs huge amounts of storage. The current infrastructure required to support a high-resolution video surveillance management system (VMS) is costly and takes time to plan, implement and maintain. Nowadays in cloud technologies, opportunity for utilizing virtualization and the distributed computing techniques of cloud storage have been pursued on the basis to find out if the various cloud computing services that are available can support the current requirements to a high end video surveillance system. The project concludes, after investigating and comparing various Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) cloud computing has what it takes to architect a VMS using cloud technologies; however, it is expensive than other solutions and it requires more reviews for legal implications, as well as threats and countermeasures related to cloud technologies for a video surveillance management system.

2. INTRODUCTION:

The traditional video surveillance systems are being replaced by fully networked digital systems composed of cameras with IP connectivity, network recorders. This has made video surveillance systems "smarter", and more sufficient, thanks to the efficiency of running automated computer video analysis on video streams, which release human operators from intensive and tedious monitoring tasks. Nowadays "Smart" video surveillance systems are based upon machine learning and computer video techniques, able to detect automatically a variety of events of interest for different utility, such as traffic monitoring, security, customer behavior analysis in different areas, etc. These video surveillance systems store video sequences/snaps and data information related to objects and events detected. In large scale systems with many cameras, storage requirements increase rapidly. For this reason, current client-server architectures may be too expensive for startups. In addition to hardware costs, they also have high maintenance requirements, and require skilled personnel to deploy and configure them. The proposed system uses object detection method to capture anything that comes in the range of the camera and uses it to checks in the database if any similar picture is stored for any information about the snap taken. The database we are using can be used over local host as well as cloud hosting services. The cloud storage stores the database in secure and efficient manner.

3. LITERATURE SURVEY:

1. Video Surveillance Systems**,** ĽUBOŠ OVSENÍK[1], ANNA KAZIMVORA[2], JAN TURAN[3]
2. This paper deals with many existing video surveillance systems. With the growing quantity of security video, it is necessary that surveillance system supports security personnel in tracking and monitoring activities. The aim of this surveillance application is to detect, track and classify targets. This paper is based on object modeling, change detection and activity analysis.
3. REAL-TIME MULTI-PERSON TRACKING IN VIDEO SURVEILLANCE, Long Jiao, Wei Niu, Yuan-Fang Wang and Dan Han

4. This paper summarizes our video surveillance research framework. They then survey current research on human activity recognition, and present the current work on real-time multi-person tracking. By applying adaptive background subtraction, foreground regions are first identified and segmented.
5. Video Surveillance Systems – A Survey, C. Lakshmi Devasena , R. Revathí, M. Hemalatha
6. This paper deals with a video surveillance system that is automated. This video surveillance system follows an automated process. They have used object detection method for tracking purpose. They have also proposed MSS(Multimedia Surveillance system in this paper)

4. EXISTING PROBLEMS:

Managing a video surveillance system that utilizes cloud technologies is going to have the risk of availability with the assumption that network connectivity is required at all times. This could potentially place the video surveillance system vulnerable to Denial of Service attacks (DoS), which would lead to another layer of error to be handled. Additionally, with any such system, issues could arise to manage the people and technological resources that are used to support the video surveillance system. By using cloud technologies within a video surveillance system, it is going to require another layer for controlling the various access requirements as admins and users within the video surveillance system. Therefore, security control mechanisms such as administrative, physical and technological needs to be documented and implemented in ways to detect and prevent the correct types of access controls and to be flexible so that it can integrate them into the company's design.

The commercial video surveillance systems uses central server that performs both processing and storage work for the cameras. The surveillance systems working on cloud provides with solutions to store and serve multimedia to end users with less latency and high data transfer speeds.

5. GENERAL ARCHITECTURE:

As described, the cloud based architecture provides with a smart surveillance system which is fully scalable supporting pay per use business model. It comprises the following components:

1. **Client:** Starts recording the footage for 2 minutes as soon as it detects motion.
2. **Alert System:** As soon as the system detects any kind of motion and webcam starts recording the footage, an alert message is also passed on to the mobile of the user saying that 'someone detected'.
3. **Web Module**: The web module is used to upload and retrieve the stored videos on the online server.
4. **Storage**: The database made in Microsoft SQL Server stores the information of the video stored.

i. IMPLEMENTATION:

The design of the system provides several advantages like the condition of using local host instead of cloud service in case of low performance. As the cloud storage fails the updating of the database can be done on the local host on the work station.

The camera chosen in our tests is an integrated webcam in my Dell Inspiron Laptop.

ii. PROCESS:

1. First the interface of the surveillance is turned on and the start video button is pressed. The webcam gets activated.
2. Second, it detects motion in the range of webcam and as soon as an object is detected in its range, it starts recording video for 2 minutes approx. This is a cyclic process which continues to record till it detects the motion in its range.
3. As soon as the system detects a motion and starts recording the video, an alert message is generated by the system which is received by the user on his/her mobile phone.
4. The alert message states that any type of motion is detected.
5. All the video gets stored in a folder present on the workstation (laptop).

6. The user can upload and retrieve those videos on a hosted server using a web module. This makes the system more flexible as the user having an authorized access can retrieve those recorded videos from anywhere using the internet services.

6. SOFTWARE REQUIREMENT SPECIFICATION (SRS):

i. HARDWARE:

- Processor : Pentium 2.4 GHz
- Camera : Integrated Webcam

ii. SOFTWARE:

- Operating System : Windows10
- Font-End Tool :.NET
- Back-End : SQL Server

7. CONCLUSION:

Modern video surveillance systems have several advantages, but the traditional client-server architectures used nowadays pose many limitations, mainly related to scalability and storage problems. To solve this problem we propose a video surveillance system using Cloud Computing technologies that provides a solution that is reliable and may work with numerous storage providers at the same time. The client manages an integrated webcam and works in a secure way with the processing server. Our system also demonstrates that Surveillance system can also face a network problem or a failure so we can also manage and manipulate the system on a local host and upload it later on cloud as soon as connection with the network is re-established.

The modular architecture proposed in this paper takes advantage of the Cloud Computing paradigm and is suitable for the future advances in surveillance, such as the incorporation of multi-sensor and biometric solutions or 3D video.

8. REFERENCES:

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