CLOUD-BASED MULTIMEDIA SENSOR NETWORKS

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January 22, 2023

1 INTRODUCTION

Cloud Computing provide services based on demand request and offers several benefits such as resource pooling, virtualization, rapid elasticity, low cost software, wide network access. It is integrated with wireless sensor network to offer reliable data delivery in multimedia.Wireless multimedia sensor network(WMSN) contains numerous wireless nodes that can extract multimedia data such as video,vocal and other sound streams,pictures.This is integrated with cloud network to improve performance level of WMSN.This integration will provide the capability to WMSNs to store large amount of data's, real time data processing, correlate, and append the collected data .

2 CHARACTERISTICS OF WMSN:

- There are no resources in WMSN to deal with the energy,memory and data rates . Thereby limiting efficiency of sensing devices.
- In WMSN networks transfers the multimedia data including snapshot and streaming content.
- Wireless Multimedia Sensor Network requires higher bandwidth to transfer Multimedia data's, especially video streams.
- multimedia content Processing is most important problem in designing of network. During delivery the characteristics of source contents are not considered. However, multimedia content processing and delivery are dependent on each other, this cause major impact on the Quality of service. Cross layer approach provides the effective multimedia content processing and delivery of multimedia content

3 APPLICATIONS OF WMSN:

- A WMSN sensor helps to monitor and prevent the illegal activities and terrorist attacks in real time. Multimedia content such as images and videos are used to identify persons or to locate criminals or terrorists geographically.
- WMSN helps to understand the flow and congestion in roads. By understanding this we can use it for efficient road systems in cities for monitoring and retrieving information about traffic on highways and average speed. It also used to reduce journey times, emissions and save energy
- The health care advisors uses the mobile devices to monitor elderly people identify the causes of illnesses that affect them such as dementia.
- Networked gaming is a type of game played through high speed networks. WMSNs will help to develop new prototypes toenhance the gaming experience of game player. For example Play station games they uses sensor to observe user actions.
- Wireless multimedia sensor network (WMSN) plays major role in industries and Environments. it extracts the information such as temperature, water flow from environment to avoid natural disasters . In industries sensors are used for find defects in final products to improve the quality of manufacturing.

4 Algorithms

- Mendes et al. proved that there is no efficient Medium access scheme to reduce network congestion. For this problem Mendes et al proposed the dynamic TDMA method with a cross-layer admission control is proposed. To share the network resources between the two nodes in the cloud-based WMSN reduces delay and congestion notifications.
- Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S National Institute of Standards and Technology (NIST) in 2001. AES performs operations on bytes of data rather than in bits. Since the block size is 128 bits, the cipher processes 128 bits (or 16 bytes) of the input data at a time.
- Asghar et al. shows that keys are acts jointly to guarantee message integrity against tampering, while at the same time authenticating the source of a message is also improving the efficiency of security.

5 ARCHITECTURE

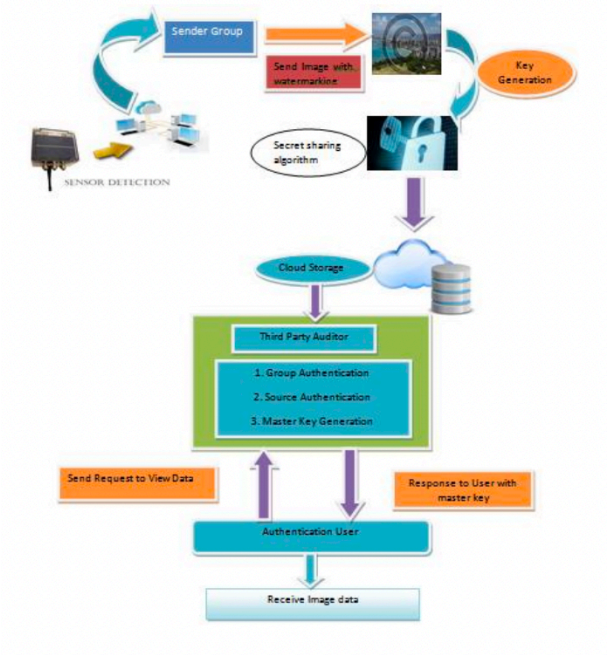

Figure 1: Architecture of the proposed system

TheDeployed sensor nodes collect the multimedia data such as image etc. from environment. The extracted data encrypted with AES algorithm, transmitted and stored in the cloud by using secure sharing algorithm. The third party generates the key to authenticate valid user. It is done by three authentication methods namely group, source, master key authentication

- SENSORS :
  - Standard WPAN Technology is consist of two types of sensor nodes with characteristics of light intensity and movement detection to detect of movements enemy troops. The video sensors should be deployed in the protected area to provide full surveillance instead of risking soldiers' lives.
  - Multimedia sensors have a greater transmission rate up to 11 Mb/s when compared to scalar networks. Hence they are used though they transmit less frames compared to scalar sensors.

- Watermarking is the adding new data into multimedia content. This is used to verify the trustworthiness of the content or to identification of the origin of multimedia content.
- KEY MANAGEMENT
  - Key management forms the basis of all data security. Data is encrypted and decrypted via the use of encryption keys. here are two types of cryptographic keys, symmetric and asymmetric keys.
  - Symmetric keys deal with data-at-rest, which is data stored in a static location, such as a database. Symmetric key encryption uses the same key for both encryption and decryption. Using data in a database as an example, while the data is stored in the database, it is encrypted with the symmetric key. Once an authorized user attempts to access the data, the information is decrypted with the same symmetric key and made accessible to the user.
  - The other type of cryptographic key is an asymmetric key.Encryption using asymmetric keys is a little more complicated than symmetric key encryption. Instead of using the same key for both encryption and decryption, two separate keys called a public and private key, are used for the encryption and decryption of data.
- Cloud storage is a part of the cloud computing network. It is one of the service model of cloud computing in which data is stored, maintained and backed up from anywhere of the world and make it available to users over a network
- AUTHENTICATION
  - Group authentication: provides assurance that the packets are transmitted by a registered group member (a registered server or a registered user)
  - Source authentication: provides assurance that the packets are transmitted by a registered user.
  - Individual sender authentication: provides assurance of the identity of the registered user of the packets.

6 CONCLUSION

In existing system there is no data protection, secure access and security architecture. Due to the potential need of Cloud based multimedia sensor network systems the problem of secure communication needs to be urgently addressed. For data protection, Cryptography is the conventional method of providing confidentiality to data. One of predominant cryptographic algorithm is implemented for data protection with new key generation mechanism. With the secure sharing algorithm we are enhanced multimedia storage on cloud with secure transformations. The key management system with third party control efficiently controlled key generation of encryption process and we proved the trust worthiness of transmitted data in multimedia transformations by using watermarking technology. The most challenging task in the Internet of Things(IoT) is integrating the various security mechanisms of wired and actuator networks. For the problem addressed above in multimedia networks we addressed this issue with the help of media aware architecture.