

## Peer to Peer Communication between Android Device and PC and Video Surveillance using Android Device

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**Abstract**— Peer to peer technology is used for sharing of various contents that are already saved on PC. In this mobile is one peer and PC is another peer. Connection is established between computer and android smart phone which is peer to peer networking. This system is useful for like viewing or browsing a file which is stored on a remote computer, saving image files and text files to the computer and handling control of a remote computer using a android smart phone. Not only remote computer but also we can have control over various extended devices which are connected to that computer. It also represents architecture to improve video surveillance using android Smart-phone. This system allows application dynamic composition which is increases the overall flexibility of the system. This video surveillance system satisfies all needs of dynamism which results into easy allowing use of system to different users. This system provides better surveillance by selecting access live for past videos from different locations.

**Keywords**- Android, Cloud, Surveillance, Peer to Peer, Content sharing.

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### I. INTRODUCTION

In today's world, peoples want everything to happen at high speed and on their hands. Mobile become a most important of peoples life. Peoples want the information stored on system on their mobile at anytime, any where. This allows user to retrieve information from any place easily. Even photographs captured by mobile can be save on system storage which saves mobiles storage space. Also videos can be retrieve of web camera or IP camera from any location using smart-phone like android smart-phone. Different surveillance techniques like CCTV, video system based on PC, alarm system, are useful from security point of view. But problem occurs with such system when user of system is outside, because in that situation it is not possible to user to monitor the videos from outside. Now-a-days to communicate with each other from any location, anytime using mobile easily. By keeping the this advantage of mobile phones in mind, a smart-phone based video surveillance system has been described in this paper. This paper will give a solution for the security of houses as well as offices. Android as a server Platform, allows multiple users to use applications on cloud server via network. Android is mainly designed for physical Smart phone. Android is an open source product. Because android server is stored in cloud, Utilization of memory is more. So if cloud based application is used, the cost and wastage of storage space can be efficiently managed [4]. Application is kept in cloud, which allows to retrieve files stored on PC and transferring the photographs to the PC from any location in the world with the help of mobile. For this the mobile user will specify the name of the file and the system will search the that file, from which the contents of that file can be viewed to mobile user on mobile. For this process, cloud application has to be developed in the system and application should be developed in the android mobile. The important requirement is, the PC must be switched ON and should have Internet connection and the android mobile

should have GPRS connection or a must be connected to a Wi-Fi. To avoid extra cost, solution is use of Wi-Fi Interface. IEEE 802.11 Wi-Fi Peer to Peer is used for communication between the wireless medium. Macs are used to allow the users to exchange content via mobile phone in an ad-hoc environment. Since, Macs is a middle ware and if any fault occurs, the entire content is lost. Here only Mobile to Mobile content sharing is possible which includes many complex operations[6]. But problem with this system is that content is not shared from Mobile device to system. System also makes an user possible to know the contents of the text file that is stored on the system from any location using android mobile. Sometimes situation occurs that there may not be enough storage space in the mobile device to save the photographs taken, in such situations the user can transfer the photographs to the system. Video Surveillance is done using android mobile, IP Camera, and by using android application.



Figure.1: video surveillance

### II. LITERATURE SURVEY

Video surveillance has received a great attention as extremely active application-oriented research areas. The early use of monitoring system was the tube camera that deployed to broadcast and monitor the industrial processing in the 1930s and 1940s. The traditional video surveillance

systems normally called Close-Circuit Television (CCTV) was defective and costly since they were deployed by security teams to observe events in the scenes via visual display. To this end, automated video surveillance systems utilize integration of real-time and more effective computer vision and intelligence techniques. Therefore, automated video surveillance systems succeed to assist security staffs by generating real-time alerts and forensics investigation due to support advanced video analysis techniques. Evolution in various prominent domains of technology and science such as homeland security, crime prevention through indoor and outdoor monitoring, elder care, accident detection, monitoring crowd analysis, airborne traffic management, counting moving object (pedestrians, vehicles), human behavior understanding, activity analysis, identification, tracking, and classification of (vehicles, peoples, and any object of interest)[1]. There is also a growing demand for applications to support monitoring indoor and outdoor environment. Due to the development, availability, and low price of processors and sensors. Thus, research in video surveillance systems are multidisciplinary field associated to image processing, pattern recognition, signal processing, embedded computing, and communication. The popularity of the advances of smart phones has been increasing because they are powerful multimedia devices which are accompanied with rapid processors, effective energy consumption, and good quality, high-resolution touch screen with embedded cameras and sensors. Users are mostly interested in capturing and sharing their multimedia contents. For example, in the development of an entertainment system at home, there may be willingness on the part of the smart phone user to upload their generated content such as newly-taken photos or videos to a nearby smart phone or tablet device as a part of this system. For some users, the way of multimedia receiving the content automatically from one particular source can be perceived as of great rate. However, such users still encounter the problem relevant to the prohibitively expensive. Ensemble Mobile Wi-Fi network transfers when using a mobile wireless data connection such as 3G and uploading to a traditional web server[2]. Thus, it is pointed out that users are usually subjected to wireless data plans with limited usage. It is a matter of fact that the design of P2P protocol in a mobile environment mainly relies on the underlying wireless technologies however, for designing Peer-to-peer applications for different devices, it depends on the Lightweight Operating Systems running on these devices [3]. Manufacturers are developing cheap cost smart devices because of huge competition. There are different reasons for using the android mobile devices including open source nature of Google platform [4]. where the entire operating system is open and accessible to developers and application writing is supported by the programming language Java, and can access easily to its software development kits (SDK), which all have led to an explosive revolution of Android applications. Computer web-cams have been used only for video chats and nowadays almost every Internet user has a web-cam with his/her computer. Security is the main issue for better performance in a new technique. It has been suggested to use web cam and GPRS for visual security purpose. WMS is easy and efficient

video surveillance system. The main software runs on PC, which acts between web-cam and its controllable base and mobile phone through Internet. It receives requests from mobile phone and sends WAP WML page to smart phone[5].

Mobile phone are featured with equipped with latest technology that allow them to generate, store large amount of digital content. Digital contents are associated with the user specifications.

This paper investigates a system design and feasibility of solutions. It incorporates efficient discovery of contents, distribution of robust contents, and adaptive energy management techniques.[6]. Video streaming with Wireless multi-hop using Android phones the rising penetration of smart phones. In this paper we present a wireless multi-hop video streaming application for mobile phones with the Android OS. Live information can be shared and captured by mobile phone sensors (ex., camera, microphone) with persons that might be multiple wireless hops away. [7]. There are many uses of P2P applications in mobile devices. These applications include video streaming, IM, VoIP, file and contents sharing, social networks[8]. Describes a proposed Android-based middle ware acts as the interface point between mobile nodes and higher application layers for mobile ubiquitous computing. The middle ware supports and enhance the protocols for direct P2P communication among users in the ensemble mobile environment. The paper presents a P2P middle ware for the with its applications. Furthermore, the paper provides the limitations of mobile devices and the challenges encountered in the adoption of the P2P communication technology in the mobile environment[9].

### III. SYSTEM OVERVIEW

#### A. Content Sharing

Peer to Peer technology includes Content Sharing in which the Mobile will be one peer of the network and the PC will be the other peer of the network. We can connect two discrete systems in a network Using CLOUD and do a peer to peer networking. This system is used for many applications like browsing which is in a remote computer. Using a mobile phone storing images and text taken in the mobile to the home computer and controlling a remote computer. Also we can control extended devices which are plugging in the remote computer. Architecture of the System presents surveillance applications based on the usage of the service oriented paradigm, user terminals used as android Smart phones are allowing dynamic composition and extensibility of the system can be increased. for developing this system Java and android

platform is selected. Services over a the Internet are delivered as a computing resources such as hardware and software. Complex infrastructure contains the system diagrams and the abstraction from the use of cloud shaped symbol. Cloud computing entrusts remote services with a user's data, software In this system, our PC data cloud. The PC data such text files, pdf files. Through this storage facility, our mobile data is stored in cloud. We can also store large amount of data in cloud. This avoid the insufficient

memory of mobile. Data which is stored in cloud can be viewed by the authenticated person.

**B. Video Surveillance**

In this system IP (Internet protocol) camera is used as camera. IP camera is wireless IP Camera. Digital video Camera is connected with network and web server is connected to local network with the Internet. IPCAM is transmitting remote video on the IP network. Videos are transferred from IP camera to the network. Images with high resolution can be transferred with the 30fps speed.



Figure 2: Video Surveillance

**C. System Flow**

System flow shows overall behavior of system. System flow clearly shows how system will behave from input state to output state. This shows all functionality and how system will change its state from one state to another on correct input to system.

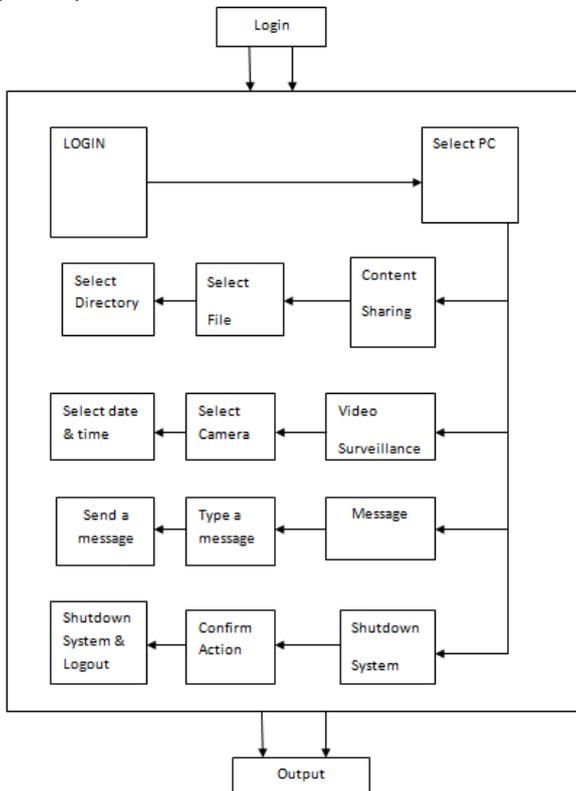


Figure 3: System Flow

**IV. IMPLEMENTATION STRATEGY**

A. Algorithm for message sending is as follows

DES Encryption Standard (DES) is a symmetric key block cipher published by the National Institute of Standards and Technology. Size of key is 56-bit. Encryption process is made of two permutations that is P-boxes, which is Calc initial and final permutation. DES uses both transposition and substitution and for that reason is sometimes referred to as a product cipher. keys are of input, output each 64-bits long. The sets of 64-bits are referred to as blocks. The cipher consists of 16 rounds or iterations. Each rounds uses a separate key of 48-bits.

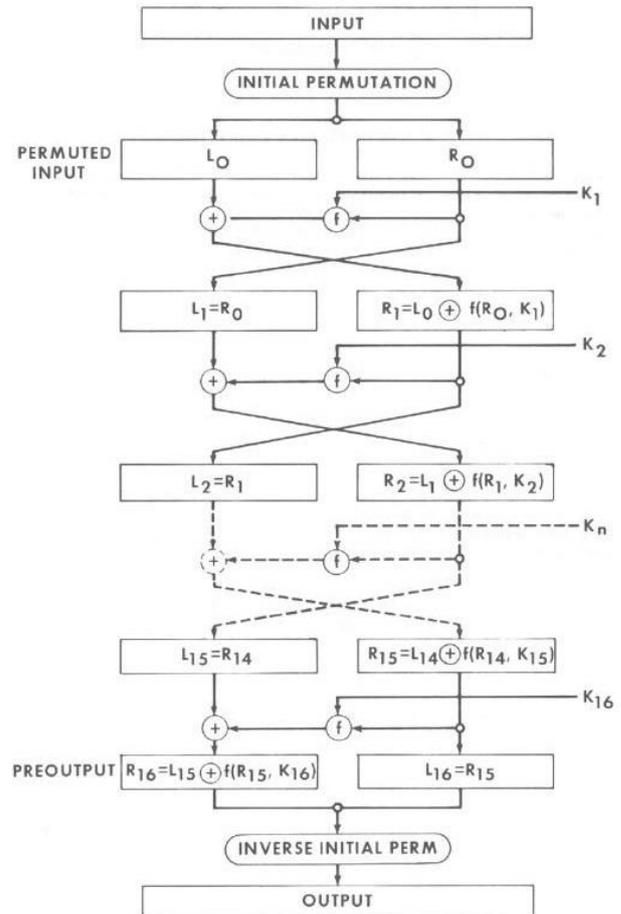


Figure 4 : Enciphering

Fig. Shows DES encryption algorithm. First, the 64-bit plain text passes through an initial permutation (IP) that rearranges the bits to produce the permuted input. Then there is a phase consisting of 16 rounds of the function, involving both permutation and substitution functions. Output of the sixteenth round consists of 64-bits that are a function of the input plain text and the key. The left and right halves of the output are swapped to produce the previous output. To produce 64-bit cipher text previous output is passed through a permutation.

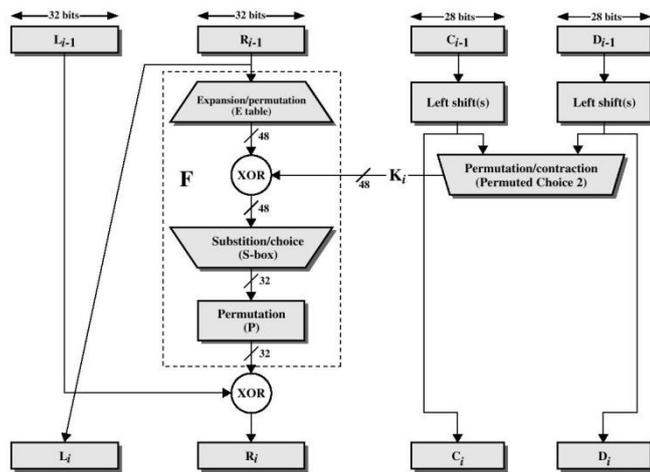


Figure 5: Single Round of DES algorithm

Fig. Shows single round of DES algorithm. The left and right halves of each 64-bit intermediate value are treated as separate 32-bit quantities, labeled L and R. The overall processing at each round can be summarized in the following formulas.

$$L_i = R_{i-1}$$

$$R_i = L_{i-1} \oplus F(R_{i-1}; K_i)$$

The left output ( $L_i$ ) is simply copy of the right input ( $R_{i-1}$ ). The right output ( $R_i$ ) is the XOR of left input ( $L_{i-1}$ ) and right ( $R_{i-1}$ ) and key for this stage is  $K_i$ . In this stage, the substitution and permutation both functions are used.

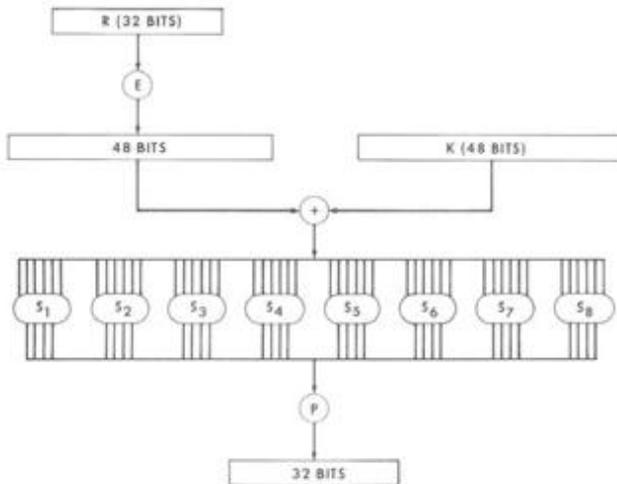


Figure 6: S-boxes in the function (F)

The role of S-boxes in the function  $f$ . It consists of set of eight S-boxes, each of which 6 bit as input and produces 4 bits as output. The 48 bit input block is divided into 8 sub blocks and each sub block is given to a S-box. The S-box transforms the 6 bits input into a bit output. The block to be enciphered as subjected to an initial permutation IP, then to a complex key independent computation and permutation which is inverse of the initial permutation IP. The key independent computation can be simply defined in terms of a function  $f$ , called the cipher function, and Key scheduling function is used.

### Key Generation

64-bit key is used as input to the algorithm. The initial 64-bit key is transformed into a 56-bit key by discarding every 8th bit of the initial key. Different 48-bit sub key is generated from 56-bit key during each round using a process called as key transformation. The resulting 56-bit key is treated as two 28-bit quantities. These shifted values serve as input to the next round. Shifted values are taken as a input to permuted choice two and 48-bit output is used as input to the function  $F(R_{i-1}, K_i)$ .

### B. Video surveillance

In this system IP (Internet protocol) camera is used as camera. IP camera is wireless IP Camera. Digital video Camera is connected with network and web server is connected to local network with the Internet. IPCAM is transmitting remote video on the IP network. Videos are transferred from IP camera to the network. Images with high resolution can be transferred with the 30fps speed.



Figure 7: IP Camera

### C. Content sharing

Current mobile file sharing can be done in a 2G and 2.5G environments. The paper then illustrates and predicts what the Peer-to-peer architecture will be in 3G environment. With the wireless multi hop video streaming application is proposed. Persons that might be multiple wireless hops away sharing live information with sensors. Peer to-peer video streaming application for Android phones that evaluate various video streaming scenarios, various video and various generations of Android phones. Multi hop video streaming can be used in various applications. Mobile phone captures the video, user can view it from single place. The contents are not confidential and anyone can misuse or by using the multi hop video streaming application. To resolve this an application supports video monitoring from anyplace using Android Application. This provides an added advantage for secure monitoring, because the application is kept in cloud.

A user will send a message that contains various information for example pictures, voice, text and the recipient is recognized by using ISDN number or an email address. MMS messages size is not restricted to any size,

but due to the limitations of mobile phone memory and capacity one message maximum size could be for example 100 K bytes. Thus this depends on the mobile phones manufacturer. Software that could slice large file into smaller ones could resolve this limitation. To use MMS for file-sharing in the mobile network is one way of realizing P2P-functionality. The size is not a limitation if you would like to send audio as a ring-tone or pictures as logos or icons to others. In order to prevent the operator's economical interests in sharing multimedia files. This makes it difficult or even impossible to share files of interest in the mobile network. Another problem is the search functionality. In 2/2.5G networks it is impossible to send out a search request as in Internet based P2P-networks. This limits the possibility of mobile file-sharing. Internet based server can be used as a contact server, this could be the solution of this problem. The contact server allows that are interested in sharing and storing their data such as contact numbers, and a list of files available for sharing on their mobile phone on the server. The interface to the database could be realized as a WAP or a HTML-based search page. If a search in the sharing database the phone number to the sharer would be given and the file could be requested by sending a MMS request for the file to the sharing phone.

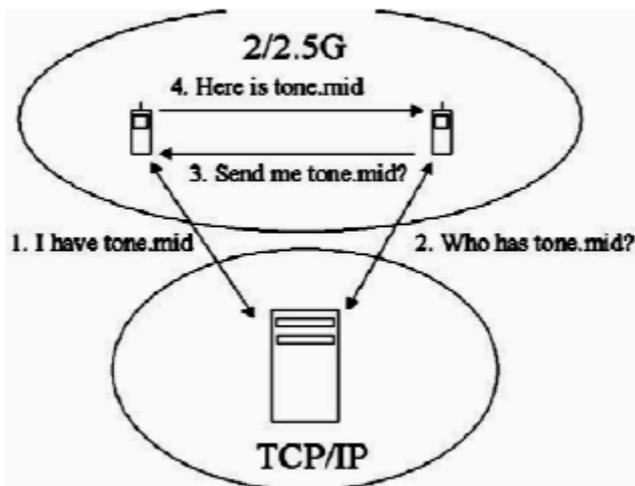


Figure 8: File Search And Share

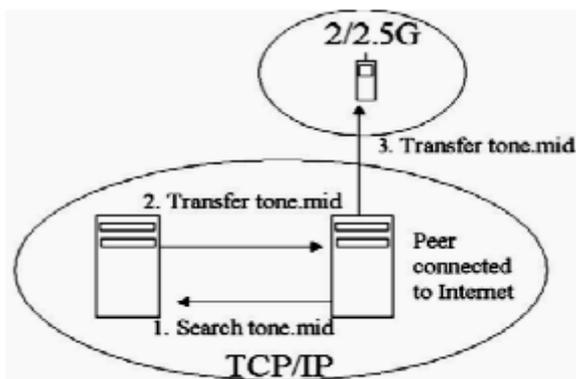


Figure 9: Computer Aided P2P

## V.CONCLUSION

Peer to Peer technology is very efficient technology for retrieving all types of files ,that may be a text file, image file, audio file etc. from the system through android smart phone and it is also useful to transfer photograph's from mobile to system. Different videos from different cameras are accessed from any location via android smart phone. For more security , notification messages can be developed. When any unauthorized person enters in prohibited areas, user will get notified. Further two way communication between smart phone is possible.

## REFERENCES

- [1] Estevez-Ayres, P.Basanta-Val, M.Garcia Valls, J.A.Fisteus and L.Almeida, QoS-Aware Real-Time Composition Algorithms for Service-Based Applications,IEEE Transaction on Industrial Informatics,Year 2009.
- [2] Jae Kyu Lee, Jong Yeol Lee, Android Programming Techniques for Improving Performance,IEEE 3rd International Conference on Awareness Science and Technol- ogy(iCAST),Page(s) 386-389, Year 2011.
- [3] B.Nahar, M.L. Ali,Development of Mobile Phone Based Surveillance System, IEEE 13th International Conference on Computer and Information Technology(ICCI)Page(s) 506-510, Year 2010.
- [4] M.Toyama, S.Kurumatani, JoonHeo, K.Terada, E.Y.Chen, Andro id as a Server Platform, IEEE Conference on Consumer Communications and Networking Conference(CCNC), Page(s) 1181-1185, Year 2011.
- [5] S.Ahmed, A.Khan, I.Babar, Monitoring Detection and Security Maintenance using WMS-Webcam Mobile Surveillance, IEEE Conference on Emerging Technologies(ICEF), Page(s) 58-61, Year 2007.
- [6] T.G.C.Kooh, Qin Lv, S.Mishra, Attribute Based Content Sharing in Mobile Adhoc Networks of Smartphones over Wi\_, IEEE 21st International Conference on Computer Communications and Networks (ICCCN), Page(s) 1-9, Year 2012.
- [7] Peizhao Hu, N.Symons, J. Indulska, M. Portmann, Share your View: Wireless Multi-Hop Video Streaming using Android Phones, IEEE International Conference on Perva-sive Computing and Communications Workshops(PERCOM Workshops), Page(s) 782-787, Year 2012. 40
- [8] T.Osano, N.Ishikawa, K.Kitagawa, F.Nagasaka, Design and Implementation of Imaging Protocol for Mobile Phones, 6th IEEE International Conference on Consumer Communications and Networking Conference(CCNC), Page(s) 1-5, Year 2009.
- [9] A.M.F.Garcia, A.P.Esteban, Reusing Educational Contents in M-Learning, IEEE International Conference on Advanced Learning Technologies(ICALT), Page(s) 448-449, Year 2011.



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