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CLOUD-BASED: VIRTUAL SMARTPHONE

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A B S T R A C T

The number of Smartphone users and available mobile applications is constantly growing. It's common to expect a Smartphone to function similarly to a PC. We present the Virtual Smartphone over IP system, which gives users the ability to create virtual Smartphone images in the mobile cloud and customize each image to meet particular needs.

This study suggests ViSP, a cloud-based platform for virtual smart phones. We offer cloud-deployed virtual smart phones that are created utilizing virtualization technology.

Comparatively speaking, desktop and laptop computers are more powerful than mobile devices. Additionally, the hardware capabilities of each mobile device range greatly, which impacts how people interact with their smart phones.

Keywords*: virtualization; android; remote display; cloud computing, zlib encoding.*

1. INTRODUCTION

Everybody owns a smartphone these days. Users of smartphones are increasing, as are the number of mobile applications available. There are a number of problems with frequent use, including battery life, storage space, and CPU power. This study suggests the Cloud Based Virtual Smart Phone, which enables users to run mobile applications on created virtual images remotely. It enhances the battery's functionality and storage potential. Running a mobile application in the cloud offers a number of benefits, such as improved computer capabilities and the avoidance of dubious local network apps.

More people are using smartphones instead of laptops and desktop computers due to their portability and connectivity. When compared to those of traditional computers, smartphone hardware resources such the central processing unit (CPU), memory, storage, and battery are frequently more sparse. And these limitations must be taken into account by mobile app developers.

One of the most energy-intensive parts of smartphones, thousands of new programmes are developed daily. These applications not only expanded a smartphone's software capabilities but also helped it overcome hardware constraints. Cloud computing minimises the amount of energy needed for computationally expensive programmes to run on smartphones by offloading.

Hardware independence is another crucial feature that sets cloud computing apart. As a result, the smart phone's scalability is increased and there is no longer a need for frequent hardware updates.

The research of end-to-end computing processes from smartphones to servers is necessary, even though cloud computing can occasionally reduce the energy consumption of devices. This paper makes a case for doing just that. In order to establish whether offloading is a superior option, this study investigates several offloading scenarios. Web requests can be dumped via Ethernet or Wi-Fi.

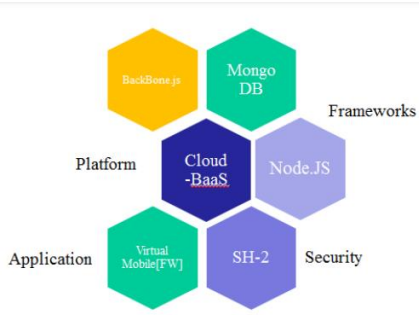
Wi-Fi or cellular data can be used on smart phones to access cloud computing. No study has been done on cloud computing including cellular data due to the fact that cellular data is the most often used form of communication since it is more easily accessible than Wi-Fi.

Many scientists believe that shifting tasks to the cloud can improve computation and storage performance while lowering the battery consumption of smartphones.

2. STRUCTURE

The block type structural diagram of integrating the various cloud services is shown in the overview of system architecture shown in Figure 1. Back Bone.JS and Node.JS are included as frameworks, cloud (Backend as a service) BAAS is a platform, and MongoDB is a cross-platform, virtual mobile framework. For security purposes, SH-2 is employed.

The cloud-based virtual smartphone's system architecture is shown in Figure 2. This shows the actual relationships between virtual mobile servers and client end devices



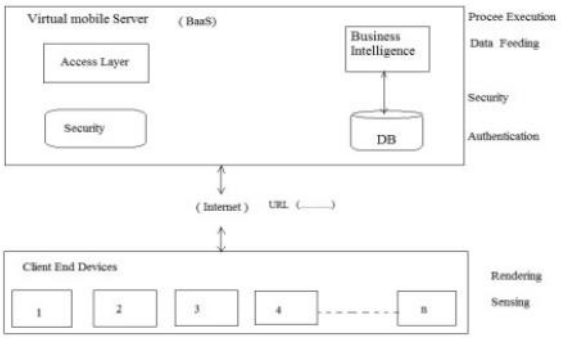


Fig -1: System Architecture Overview **Fig -2: System Architecture**

3. LITERATURE REVIEW

The main topics of our literature review are cloud computing and cloud-based services. The purpose of this study is to design mobile applications that facilitate users' calculations and connections to their cloud-based applications. Less memory usage and battery consumption are our main priorities. We are developing Android applications that may be stored and used online. MobiDesk, a mobile virtual desktop hosting architecture developed by R.A. Baratto and S. Potter for this application, offers mobile users a fully functional PC desktop environment. Another is DeskPod by S. Potter and J. Nieh, which is a mobidesk upgrade that concentrates on dependability difficulties.

Despite the fact that these books are pertinent to our work, their focus on distributing PC software to mobile users differs from our goal of leveraging the performance of mobile applications in order to enable mobile users to remotely access virtual machine images.

4. PROBLEM DEFINITION

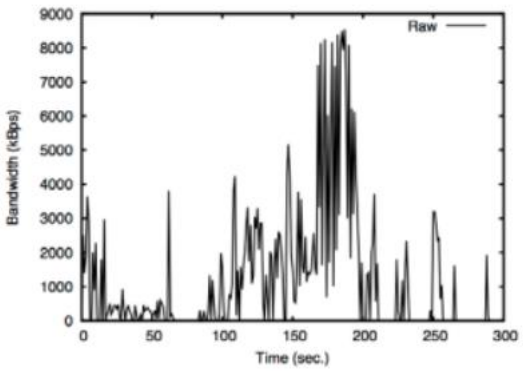
A mobile app and a cloud-based backend are combined in the hybrid system known as Virtual Mobile. In this technological age, technology and automation are advancing. On the other side, automating systems with a lot of data has a negative effect on how well the system works. the volume of referenced APIs and databases. An unfavourable perception of the system, which could be a mobile app or a web-based software system, develops as a result of user frustrations caused by using the client machine.

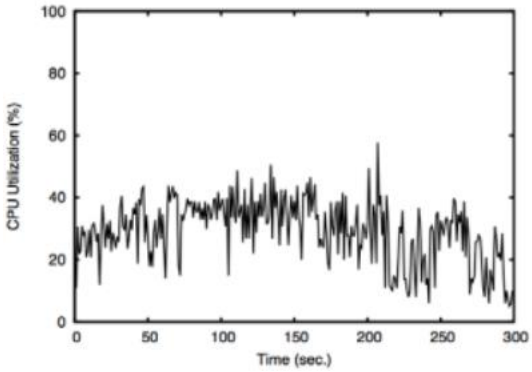
A system that handles execution in two phases rather than barrages data and system at the client end should be made available in order to address these performance problems and lessen client machine load. The system should be built such that functions are carried out at the client end and database and reference API processing is done at the back end server end.

5. ANALYSIS FINDING

The tests are run in a different network setting. The server is powered by a 3.1GHz Intel Core i5-3450 CPU and 8GB of system memory. The client app is executed on the LG Nexus 5. The simulated smartphone OS that runs on our customised Android emulator is Android 5.1. The resolution of the virtual Android is 320x480 pixels.

The CPU use of the server is depicted in the figure. The typical CPU use on one core is 29.25 percent. A quad-core CPU like the one we use can support up to 10 virtual Androids on a single server.





Running a virtual version of Android on a server can significantly lessen the CPU burden on a physical device. A server with a CPU that is more potent than those on mobile devices may run all apps. On the other hand, screen reconstruction has to be transmitted via the internet. The cost of bandwidth must be taken into account because clients can be utilising 3G or 4G. Depending on how much data they consume, they can be charged.

6. BANDWIDTH COST USING ZLIB UNCODING

The bandwidth cost was calculated over a 5-minute period, as shown in the figures. The bandwidth use for delivering the screen directly to the client is shown in the figure.

In the third minute, we begin a game on the fictitious Android, therefore the bandwidth has substantially grown in the graph. By employing zlib encoding, we can significantly reduce the size of the screen pictures. Figure displays the bandwidth cost for zlib encoding. Network bandwidth is hardly ever used when playing games. Average bandwidth costs for raw and zlib encoding were 1199.2 kBps and 79.1 kBps, respectively. The bandwidth can be further reduced if a lossy compression method like JPEG is used.

7. RESEARCH METHODOLOGY

The Secure Virtual Mobile Platform is an open-source, cloud-based virtual platform for smartphones. It helps solve numerous problems related to secure containers and "bring your own device" by using a user's actual phone as a terminal for remotely accessing a virtual smartphone running commercial smartphone apps. Sensitive data and apps can then be safely stored on these virtual devices, which are safely operated in a data center.

This study aims to address the problem of smartphone battery consumption and processing resources.Less memory usage and battery consumption are our main priorities.

We intend to develop Android applications that function on the cloud.

8. CONCLUSION

This paper presents t hat study introduces ViSP, a cloud-based virtual smartphone. Through the use of virtualization and client software on their mobile devices, users may construct virtual cellphones in the cloud. According to the experiments, ViSP can provide a respectable user experience with minimal bandwidth requirements when using zlib compression. Customers may use it to remotely execute their programmes on pictures of virtual smartphones hosted in the cloud. Sensor readings on a physical smart phone can be accessed by cloud-based mobile applications. increases the performance of mobile apps by offering almost infinite processing resources, such RAM, without reducing the battery life of the device.

9. LIMITATION AND FUTURE WORK

We wish to add multi-touch and sensor support to better use the capabilities of physical devices. Because they provide ground-breaking features like administration APIs, live migration, etc., we also want to migrate the server platform to KVM or Xen.

10. ACKNOWLEDGEMENT

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