Cloudroid

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Abstract - The Babbage Difference Engine, the first computer, had a memory storage capacity of just 675 bytes. Technology has evolved so much in just the last 100 years that most of us carry more than 12 GB of data in our pockets. Yet sometimes even those 12 gigabytes are not sufficient to store all our data and we keep looking for mediums of extra storage. The storage that smartphones provide can be divided into 2 parts, one used for storing application data and the other used for storing actual/personal data. While installing new applications into a smartphone there are times when the apt amount of storage is not available due to which we are asked to uninstall some pre-existing applications to accommodate the new application. There are times when uninstalling pre-existing applications is not possible as it will lead to loss of data. We aim to cut this process by providing a platform where the user is allocated virtual cloud-based storage where he/she can install apps and use them in real-time without investing physical memory of his/her device. Cloudroid uses container-based technology to simulate Android OS on mobile/desktop devices so that users can access a virtual smartphone as and when required without any hardware restrictions provided, they are connected to an active internet service.

Index Terms – Cloud, Android, Virtual Machine, Emulator, Remote Android Client.

I. INTRODUCTION

In today's fast-paced digital world, smartphones have become an essential tool for communication, entertainment, and productivity. However, a prevalent issue that many smartphones' users face is the limited functionality and efficiency of mobile applications. This can be due to a range of factors, including a lack of hardware resources like memory, or out-of-date operating system versions. One of the most common problems that users face is running out of storage space on their devices. As users install more applications and generate more data, the limited storage capacity of smartphones can quickly become a major constraint. This can cause devices to slow down, and even crash, making it challenging for users to access the applications they need. Another issue is outdated operating system versions. As mobile technology evolves, developers are continuously releasing new versions of operating systems that provide improved functionality and security features. However, many users are often unable to update their operating system due to hardware limitations or compatibility issues with older devices. These challenges can severely restrict the functionality and efficiency of mobile applications, causing frustration and inconvenience for users. Fortunately, there are solutions available that can help alleviate these issues. For example, cloud-based storage solutions can provide users with additional storage space, enabling them to store more data and run more applications on their devices. Similarly, updating to the latest operating system version can provide users with access to new features and improved security, enabling them to get the most out of their devices. The emergence of smartphones has revolutionized the way we interact with technology, allowing us to communicate, work, and access information on-the-go. However, as technology continues to advance at an exponential pace, the lack of the latest features and computational power can quickly render a smartphone obsolete. This creates a strong incentive for users to upgrade to newer models, leading to a constant stream of new device releases and a booming smartphone industry. Despite the benefits of upgrading to newer smartphones, there are also drawbacks. Upgrading frequently can be expensive, both in terms of the cost of the device itself and the environmental impact of producing and disposing of electronic waste. Additionally, newer models may not always be fully compatible with existing technology, leading to frustration and inconvenience for users. The constant desire for greater computational power and the latest technology drives users to upgrade to newer smartphones frequently, leading to a competitive market and a booming industry. While there are benefits to upgrading, it is important to consider the potential drawbacks and weigh the costs and benefits before making a purchase. The motto of Cloudroid is "Install once use Everywhere". We decided to come up with a solution which will allow users to install applications simultaneously without consuming any extra space in the user's smartphone. We aim to reduce the need for frequent changing of smartphones due to the need for better computing power and also enable non-android users to use android applications without owning an android smartphone.

II. LITERATURE SURVEY

M.Toyama, S. Kurumatani, J. Heo, K. Terada, E. Y. Chen [1] presents several case studies where Android devices were used as servers, such as a mobile web server, a file server, and a sensor data collection server. The authors also discuss the security implications of using Android devices as servers and propose solutions to address potential security issues. The paper concludes by highlighting the benefits of using Android devices as servers, including cost-effectiveness, scalability, and flexibility. The authors suggest that using Android devices as servers can be a game-changer in the server industry, and the potential applications are endless. Overall, this research paper explores the potential of using Android devices as servers and presents several case studies to support the authors' argument. The paper provides valuable insights into the benefits and challenges of using Android devices as servers and can be useful for researchers and practitioners in the field of server technology.

S. Sridhar, S. Sanagavarapu, S. ChitrakalaIn [2] presents remote desktop application with IP Tunnelling has been proposed in a cross-platform solution to access and use remote servers and their use in the field of education, IT, IoT and embedded systems for carrying out supplication-oriented actions from a client host to the server. The paper provides a detailed description of the architecture and working of the system, highlighting its features such as encryption, compression, and multi-platform support. The authors also

present the experimental results and evaluate the performance of the system in terms of latency, throughput, and resource utilization. Overall, the paper proposes a viable solution for remote desktop sharing that overcomes the limitations of cross-platform compatibility. The system has potential applications in various fields such as education, telecommuting, and remote collaboration.

A. Kotkar, A. Nalawade, S. Gawas, A. Patwardhan, S. Mangale [3] details the architecture and design of the remote desktop client application, which is built using the Android platform and leverages the Remote Desktop Protocol (RDP) for remote access. The authors discuss the key features of the application, including the ability to connect to remote machines, view and control the desktop remotely, and transfer files between the local and remote machines. Overall, the paper offers insights into the development and implementation of a remote desktop client application for Android-based devices, highlighting the benefits it offers and its potential as a useful tool for remote access and control.

S. Ghorpade, N. Chavan, A. Gokhale, D. Sapkal [4] discusses a framework for executing Android applications on cloud servers, which aims to address the limitations of running resource-intensive applications on mobile devices with limited processing power and memory. The authors propose a solution that offloads the processing of Android applications to cloud servers, allowing users to access the applications from their mobile devices. The authors describe the architecture of their framework, which consists of a client component running on the Android device and a server component running on the cloud server. The client component captures the user's input and sends it to the server component, which processes the input and sends the output back to the client component for display on the mobile device. The paper concludes with a discussion of the future directions for the research, including the potential for integrating the framework with other cloud-based services and expanding its capabilities to support a wider range of Android applications.

III. ARCHITECTURE

The system consists of 2 parts:

1. Handheld Device
2. Cloud

Handheld Device:

The user interacts with a device where the Cloudroid application is installed, allowing access to Cloudroid's cloud-based Android platform. The application retrieves data from all available sensors on the device and sends it to the user's designated container in the cloud. This enables the user to access and analyse their device's data remotely, providing greater flexibility and accessibility. The Cloudroid application serves as the bridge between the device's sensors and the user's cloud-based container, making it an essential tool for managing and analysing device data.

Cloud:

Cloud consists of containers. Whenever a user opens the app allocated container will start. This container will have a x64 based android version to run smoothly on the cloud. Each user has separate container. these containers will process the sensor data send by the application and perform actions on the respective containers. Real time update of this system is sent back to user.

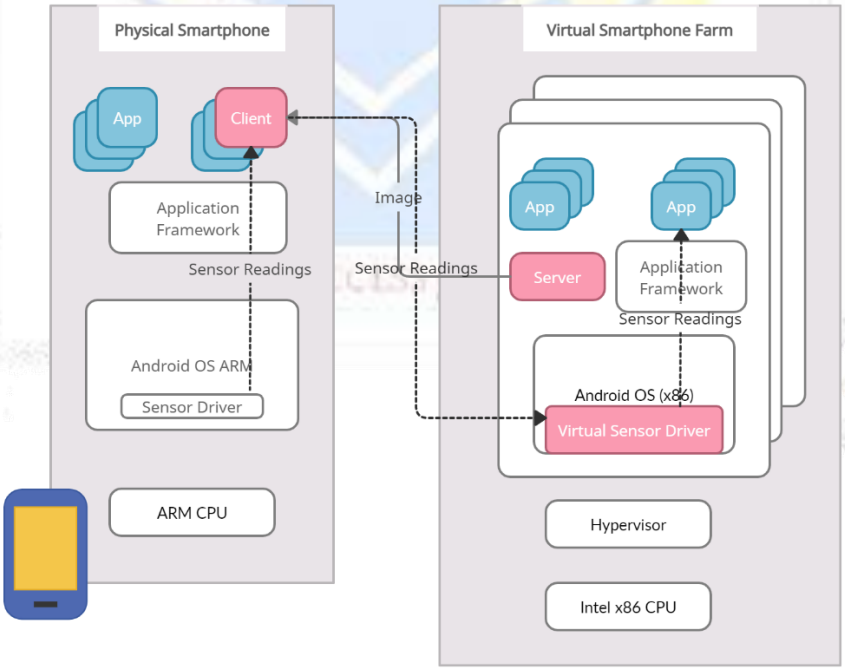

Fig.1 Architecture Diagram

IV. CONCLUSIONS

Our upcoming Android-based application will revolutionize the way Android users access storage from the cloud. Instead of relying on physical memory on their devices, users can simply access our cloud-based storage through our application, thereby freeing up precious space on their devices. This application is incredibly user-friendly, as it eliminates the need for users to constantly delete important files or other applications to make room for new ones. With our application, users can enjoy additional storage space without the need for external hardware devices. This innovative solution will overcome the storage shortage problem faced by many smartphone users, particularly those whose devices have limited storage capacity. As a result, the functionality and efficiency of mobile applications will no longer be severely restricted by limited device storage. Not only will our application solve storage problems for users, but it will also help reduce the need for frequent smartphone upgrades. Many users currently upgrade their smartphones primarily due to storage limitations. By providing an alternative solution, our application will significantly extend the life of existing devices, saving users money and reducing e-waste generated every year. We believe that our application will contribute significantly to the goal of sustainability by reducing the number of excess resources used to manufacture new smartphones. It will also provide a more affordable and sustainable option for users who want to make the most of their existing devices without having to constantly upgrade. Overall, we are excited to bring this innovative solution to the Android market and offer users a more efficient and sustainable way to access cloud-based storage.

V. REFERENCES

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