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Android Virtual Machine

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Abstract

- Virtual Machine implementation for Android Phone.
- Create Virtualization of Android Environment and offload it to Cloud Server User access to it by his phone .
- Offloading of Computation and Storage minimize usage of phone resources to increased availability of battery capacity.

Introduction

- Android is a mobile operating system developed by Google.
- Open source and based on the Linux kernel.
- User prefers Smart phone over other Mobile computational devices.
- buying a Smart phone user's demand of good Computation & Storage resources with ideal price.
- By time faces performance issues , storage exhausted.
- propose a Virtualization of Android Environment to this issues .



advantages of Virtual Machine of Android Environment

1. Computational Offloading

Removes demand on resources of phone , that's will remove burden from phone's development industries to take time for to development of better resources .



2. Storage Offloading

Remove the need of extendable memory.
once the storage is exhausted, VM memory can be archived
and fresh memory allocated.

3. Handling Android Fragmentation

User will free the need of OS updates new version.
User will be able to access to pure Android from
VM leading to removal of restrictions.



4. Handling Lost Device

prevent private data loss in case of User loses his phone. User access to his VM from other phone by installing the Client App and using his credentials.

5. Cloud Advantage

Elasticity of Cloud hosting can help in accommodating number of VM(S) on demand by Users.



Existing System

- storage level Offloading is available and successfully. Google Drive, Drop Box .
- Computation offloading is not directly implemented & available in applications .
- Apps need to be installed and executed on phone to access data from Server .
- To overcome these limitations we propose VM to offload complete User Environment.

Proposed Work

Implementation of Server Module:

Configuration of VM.

Receiving User commands and executing it on Server.

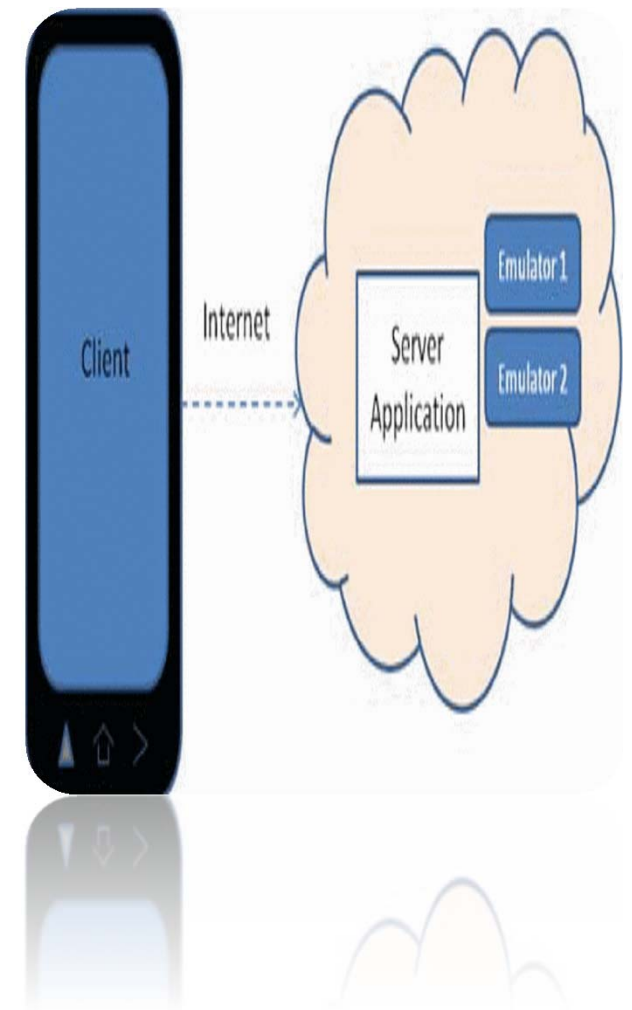
Passing Screen-shots from Server to Client.

Implementation of Client Module:

Receiving list of VM on Cloud and Select.

Receiving Screen-shots from Cloud VM and Display it.

Pass commands to Cloud Server and Display results .

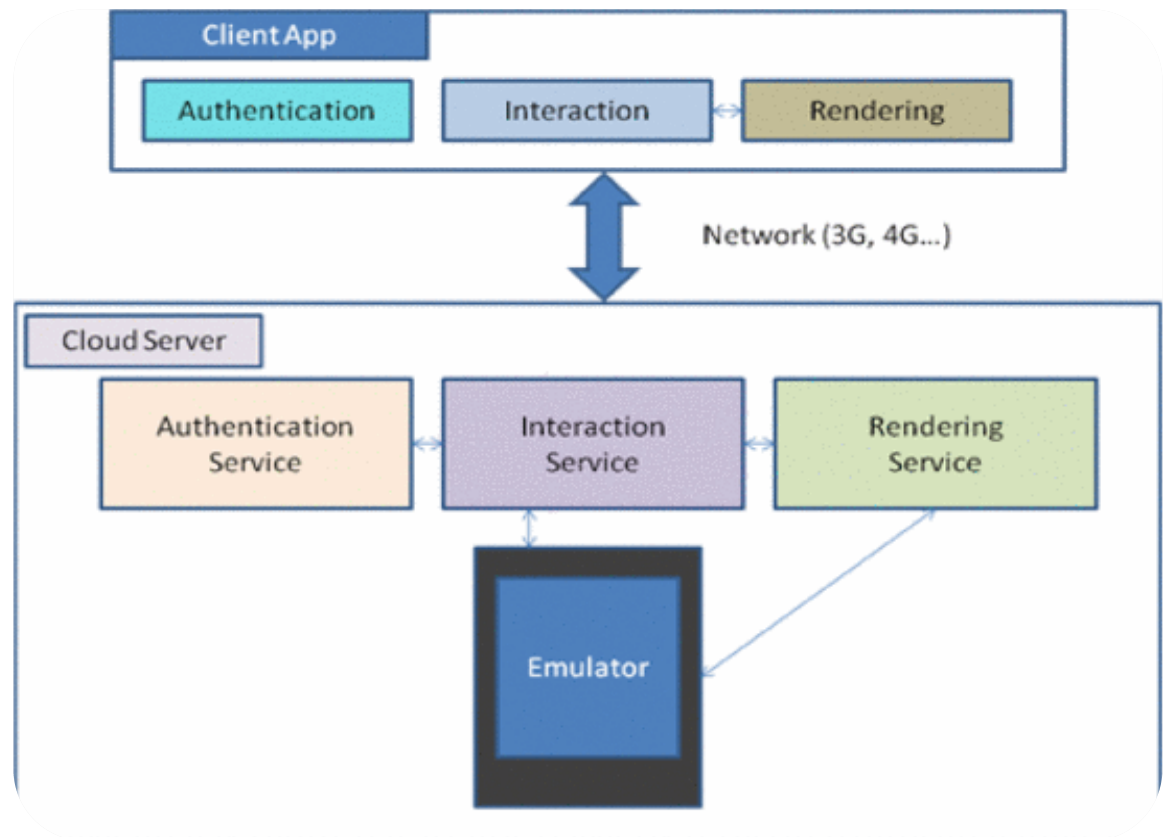


System Architecture

- Client App installed on User's phone.
- Client Module works as a Window for Emulator running on Server.
- Server Module interacts with Emulator configured .
- Server Module receives User's commands and executes it and passed back results to the Client App.

System Architecture

The Client app block represents App running on phone. interacts with Server module through 3G, 4G, and Wi-Fi networks.

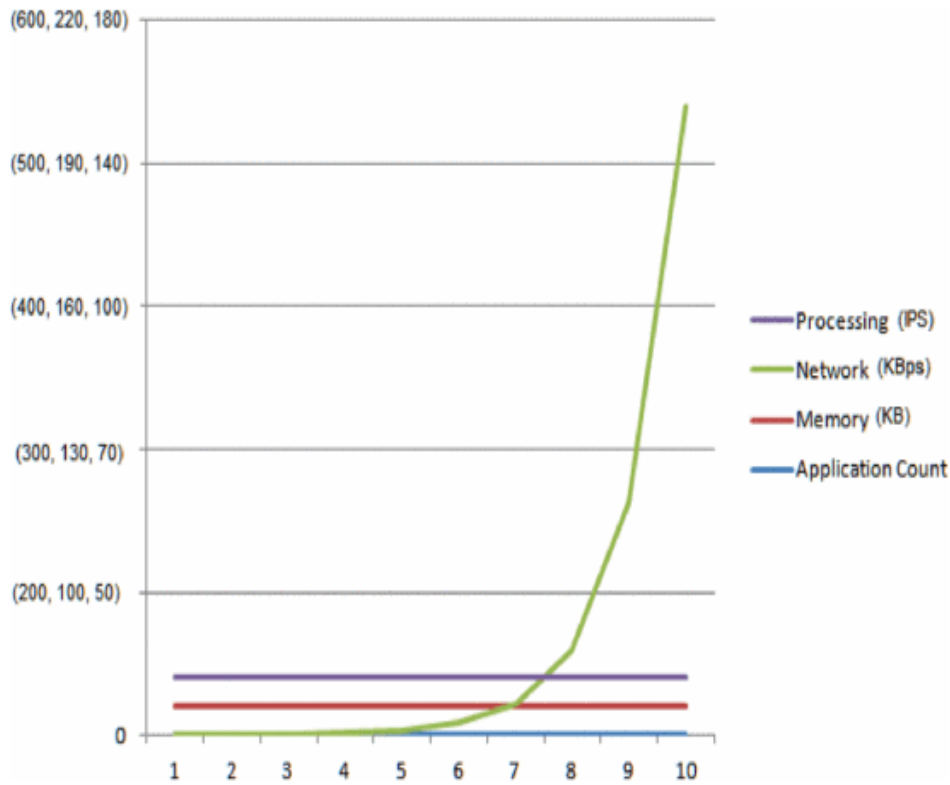


System Architecture Client and Server modules

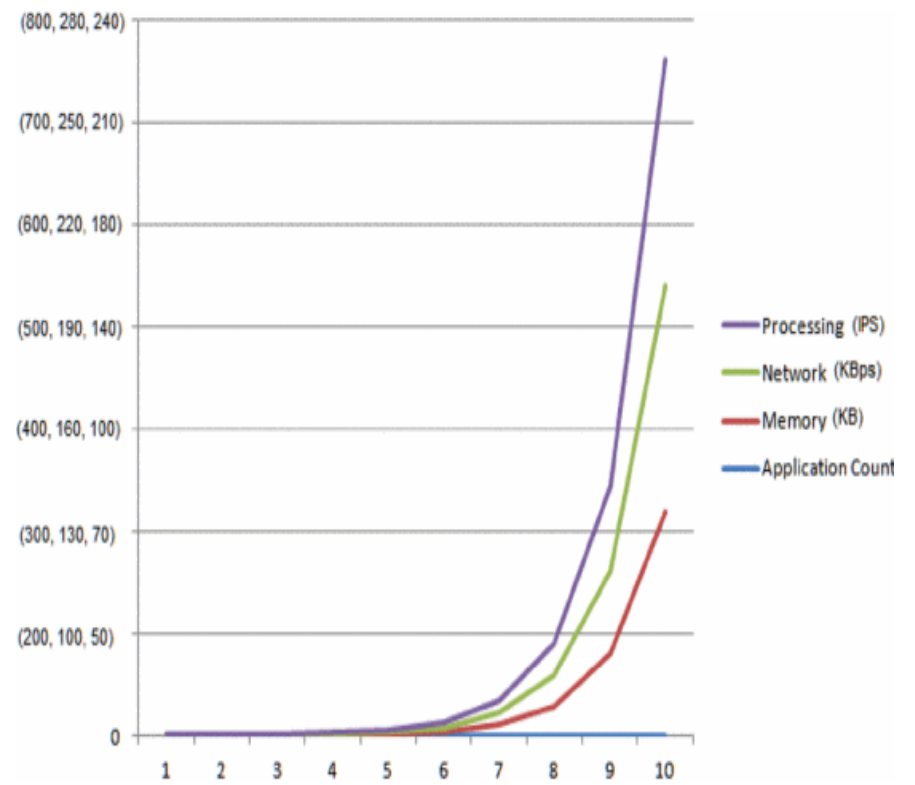
Performance Analysis

- Enhancing Storage & Computational Performance of Android Phones .
- In VM Environment only the network usage will increase.
- Memory & Processing offloaded to Cloud Server so User's phone will not be affected for it.

Performance Analysis



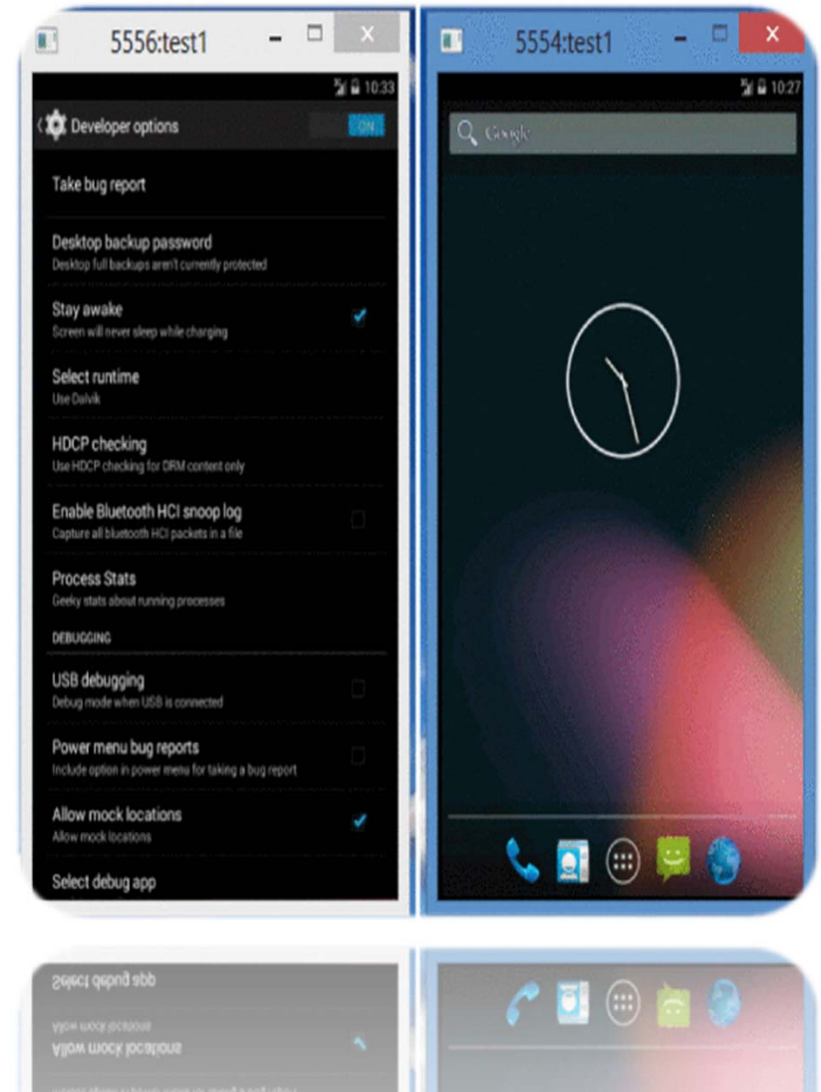
With Virtual Machine



With out Virtual Machine

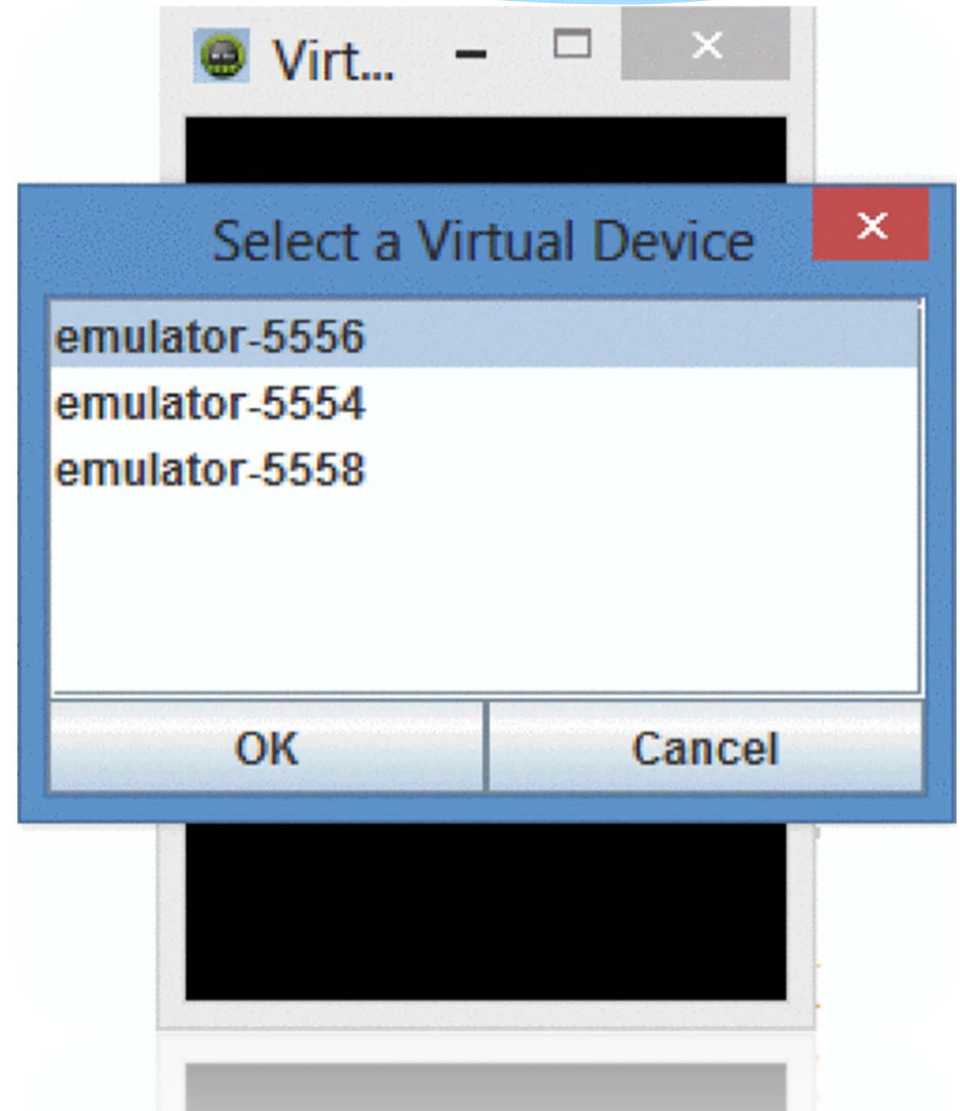
Implementation Results

- User install a VM client App on his phone this which will interact with VM on the Cloud server.
- starting app ask for the credentials.
- VM app will get the VM configured on Cloud server.



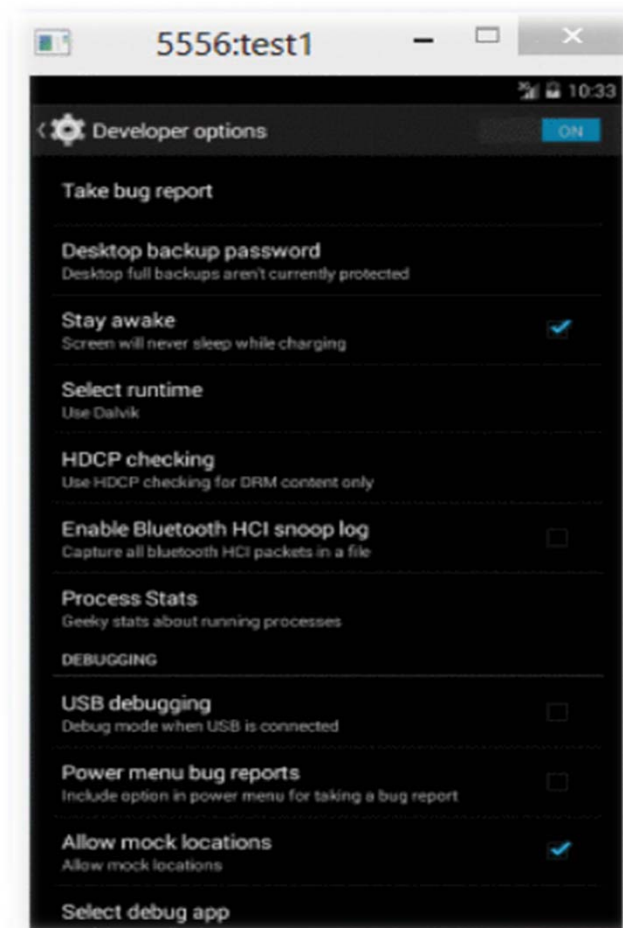
Implementation Results

If there are more than one VM configured on Cloud server then it will display list of VM's. User have to select the VM for further operations.



Implementation Results

User selected VM from Cloud server will be rendered through the VM client app on phone.



selected VM on client
app

Conclusion

- ❑ implementation of a Virtual Mobile to phone for Isolating the Android OS Environment to Cloud server.
- ❑ Freed user from upgrading phone resources on regular basis due to memory & computational inefficiencies.
- ❑ Minimize the current dependencies of phone on battery limitations.
- ❑ Multiple configurations to access different operating environments for Mobile.
- ❑ In case of network failure the state of the user maintained on the Cloud server.