JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Cloud Computing Framework and Applications

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ABSTRACT: The word" cloud" itself describes the storing a huge amount of data and then transferring whenever or wherever we required. The cloud nowadays is considered as one of the latest trends in computer science. The cloud computing in short nothing but storage of huge amount of data. Then coming towards smart phone, the mobile cloud computing comes in place, where both mobile and cloud together called as mobile cloud computing. This article used to present the offloading concept, mobile cloud computing and storage.

Index Terms: - Mobile cloud computing, Architecture, Storage, devices.

INTRODUCTION:

The cloud the word use to derive storage, the cloud is considering as one of the huge storage device for storing larger amount of data with a security. Cloud is one of demand computing using internet. The concept of cloud computing gained many popularities in the upcoming days. Cloud provide storage, application, services over the internet by this it can reduce cost and flexibility in term of resource provisioning. Cloud computing is found to be system resource where it used for data storage, availability of system resources and also for file management. Cloud provide resources to n numbers of user to get access through internet it provides services like SAAS (Software as Service) which is also known as "on-demand software" in which application are hosted by a cloud service provider and managed from central location, hosted on remote server. Example such as Google Apps, drop box, Cisco WebEx. Etc some application using SAAS as a service. PAAS (Platform as a Service) is used to create, develop, test, run and manage the applications. PAAS is used to accessible to many user and provide ability to "Auto-scale". Example such as AWS elastic, beanstalk, Google engine etc. IAAS (Infrastructure as a service) use to provide virtual computing and it manages over internet. The main use of IAAS is resources are available as a service and it is dynamic and flexible some example is Digital ocean, Microsoft azure etc. Here there is one concept of offloading. Offloading is term used for transferring the data from mobile to cloud without taking much time. The paper consist application where file images, file transfer and even download from the files in cloud hence offloading a file firebase cloud and even we can search download file in mobile device. The concept called mobile cloud computation is used to reduce the battery life time, memory storage, energy efficient

and more. The very next term is smartphone. The depend increase in smart phone bring a change in technology and increase in smartphone is more in use than a computer. The mobile application consists of face detection, image processing transfers of file, audio, video, speech recognition and games. These is also term module and architecture concept related to cloud computing framework, and also to secure the data while transferring or while storing we required a high security. As in terms of security is provide to both mobile and cloud computing.by using the MCC (Mobile cloud computing) the data is directly send to the cloud instead storing in mobile device so that whenever we required the data or file to read we can directly access through cloud and get instead downloading in mobile and reading it, we can browser and get the data on mobile through MCC.

Related Work

The Adaptive computation offloading from mobile device to cloud (Dejan et al,2012) the work describe about the challenges in computational process and also provide adaptive extension on android mobile devices. The experimental results used to evaluate MACS framework with different applications. The application defines and involves face detection and video files and provide time point for video navigation. A survey of mobile cloud computing application models (atta.ur. Rehman et al,2013) this paper use to poses a challenge of smartphone resource constraints where devices are limited with computational power, limited storage and battery consumption. Paper shows use to give mobile cloud architecture, application models and computational offloading process. The clone cloud is a concept which use to automatically transfer mobile application to cloud. It is use as static and dynamic profiling for partitioning the application (Byung-Gon-Chun et al,2011). A distributed application processing framework it is used to analyze the implications and critical of current offloading frameworks and focusses on application layer for creating new software level of research.

The think Air framework application is simple for developer to use on smartphone on cloud and use to evaluate more complex application to simple micro benchmark by using N-queens' algorithm which is use for face detection and virus scan application. A context sensitive offloading scheme for mobile cloud computing service proposed multi cloud resources such as ad-hoc, cloudlets and computing algorithm. (Bowen Zhou et al,2015)

System Block diagram

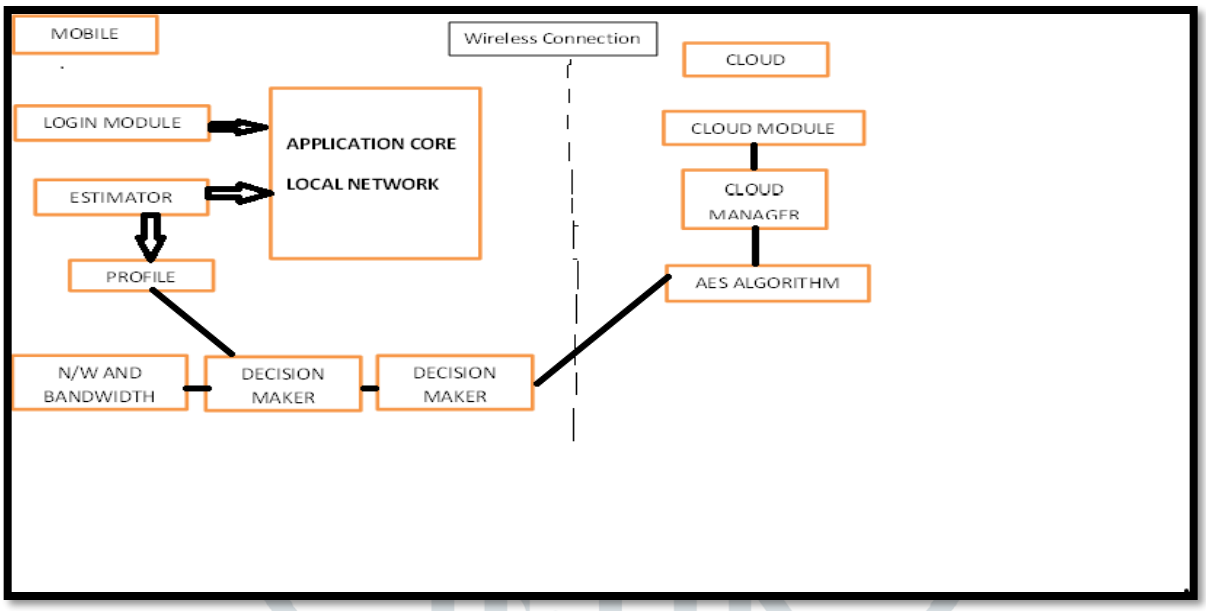

Fig: - System Block diagram

The architecture consists of two different devices related to mobile and cloud. The login module is used for user login purpose. The next estimator module obtain the value of process execution time, amount of CPU utilize energy usage and energy consumption. Profile module get values from estimator and also gives status. Mobile manager mostly at installation step. It manages the execution method for mobile device. The next device that is decision maker utilizes and gets information from profile and estimator module. The network manager when we browed and arrange files. We require Wi-Fi or 4G network. The works of cloud manager manage the cloud modules.

SPECIFIC TERM: -

- **Offloading:** - the term offloading takes a very important place. Where offloading refers to techniques where it just overcomes the limitation of mobile phone in terms of memory, battery.
- **Framework**: - it is used for much purpose. Nowadays it seems everything depends on smartphone. Where it uses to give high performance, memory and also storage.
- **Application models: -** it is different form mobile application in terms of design and objectives and also partitioning applications, profiles and awareness.
- **Cloud services**: - in cloud service user required a mobile support for offloading then the cloud should have runtime support for components.
- **Privacy:** - as we know many applications are used for providing security and many recent applications are also use for location to deliver services. Here, the cloud computing endures many security issues.

- **Scalability**: - one of important features of cloud computing. For instances, here application model may require the infrastructure and demand software installation and found to be scalable than application model which is based on cloud platform.

ALGORITHM

Offloading framework Algorithm

Input: - Usage of memory, Utilization, energy consumption

Output: - Result

1. Firstly read the method
2. Check connection
3. If there is no connection available, then execute locally on mobile device
4. Else
5. For method n, do Ttransfer,Tmemory,Tcpu,through profile module
6. If offloads takes then
7. File encryption by algorithm AES
8. Return to device
9. End if
10. End for
11. End if
12. Update

Fig:- Offloading Framework Algorithm

1.1 Computational offloading process:

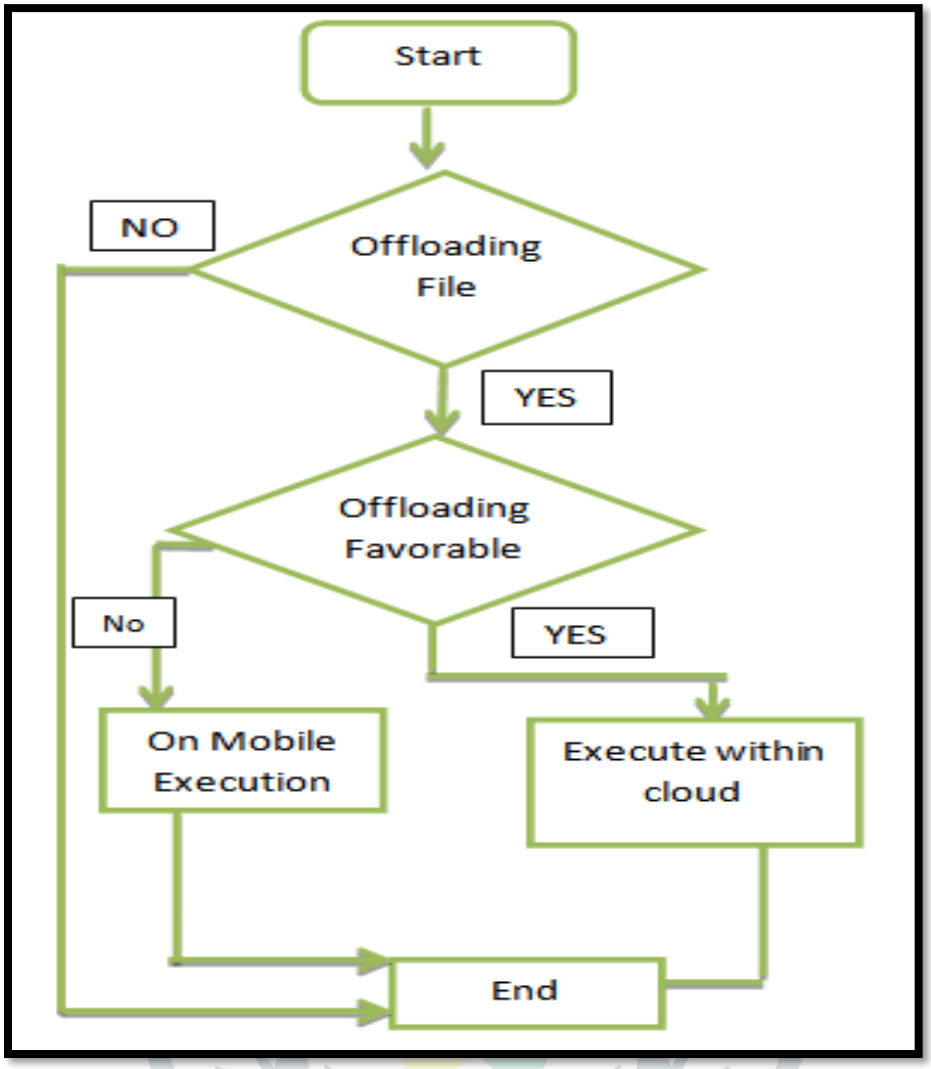

Fig: 1.2 Computation Offloading Process

The basic workflow of computation offloading process starts with execution of application. The user offloads the file to cloud if file is successfully offloaded then application checks the connectivity to cloud. The next step is to check the offloaded facts is favorable, if yes then completed within cloud remotely otherwise domestically execution is achieved on mobile device. The data store on offloaded then application checks the connectivity to cloud. The next step is to check the offloaded facts is favorable, if yes then completed within cloud remotely otherwise domestically execution is achieved on mobile device. The data store on cloud and we can excess anytime anywhere. For uploading data in the cloud we require firebase, Google cloud Engine cloud.

1.2.1 Entities in computational offloading are:

• User: -	--- Network Data Cost --- Energy usage --- Cloud Service Cost --- Application Support
• Connection	--- Technology used --- (4G/3G/Wi-Fi) --- Bandwidth
• Smartphone	---- CPU Speed ---- Memory ---- Storage
• Cloud Service	--- Memory --- Computational power --- Runtime support

Table 1.2.1 Entities in computational offloading

- **User**: A user can enable or disable the computational offloading based on network and data. For instance, user can offload data on cloud so that he can save energy, enhanced the performance of application.
- **Connection:** The connection consists of Wi-Fi which provides high bandwidth and shorter delay.3G/4 G connections that charge for bandwidth usage are used.
- **Smartphone:** Smartphone provide great development in term of hardware resource. Smartphone are equipped with high performance, memory, processor, sensors and storage.
- **Cloud service**: Cloud services are used for large amount of storage and use to store data in it. Overall performance may additionally decrease because of additional computation and put off involved in offloading method.

MOBILE CLOUD ARCHITECTURE: -

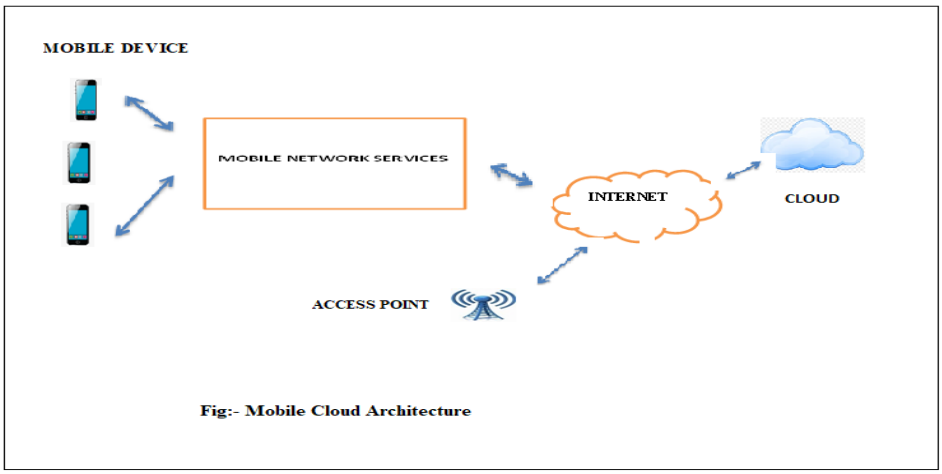

Fig:- Mobile Cloud Architecture

This figure used to give the architecture of mobile cloud. The mobile device can access cloud service in two ways i.e. through mobile network or by access point. The mobile network connected through base station (BS). the access point connects through Wi-Fi and further connected to user. The information whatever we want to transfer is passed to wireless connection with help of internet and store in cloud.

TESTING RESOURCE: -

The system is tested on a machine with 4 GB RAM, Core i3 – 5th Gen Processor and Windows 10 Operating System. XML, JAVA, JSON programing language is used.

Objectives of Testing

1. All data field should work correctly.
2. The file transferring from mobile to cloud should be properly seen.
3. To check availability of system.
4. To check maintainability.

Test Case: Operational/Functional Test

Description: In this test all the working of android application.

Id	Test Case Name	Description	Data	Result Output	update	priority	Defect
1	login	Sign up	User input (email id)	User email (valid/invalid)	pass	High	Medium
2	Login 1	Check valid id	Valid email	Login is valid	pass	High	Medium
3	File name enter	Upload the file	Enter with name	Uploaded file	pass	High	Medium
4	Enter with file name	Upload image	Valid image	Image uploaded	Pass	High	Medium
5	Select the file	Search the file	Valid name should be enter	File found	Pass	High	Medium
6	Select the image file	Search the image name	Valid img name	Image file found	pass	High	Medium
7	Storage file	File store in cloud	With different extension	Save in cloud	pass	High	High

Fig: - File Uploading Time

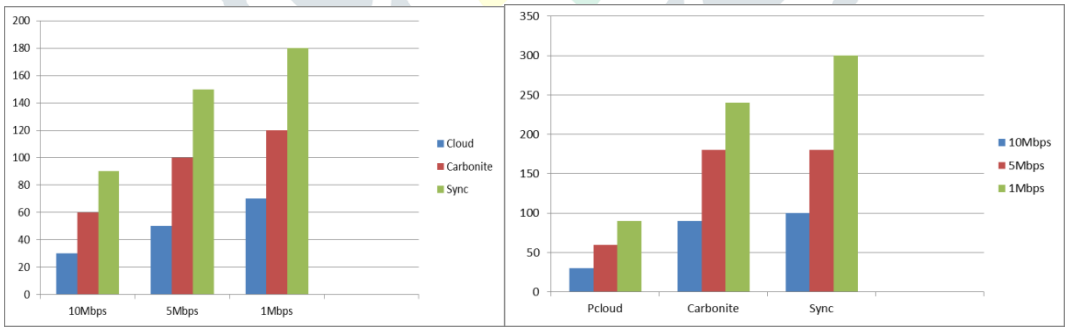

Fig: (a) Comparison for Downloading File to cloud over Internet Speed in Mbps and Time in Milliseconds

Fig: (b) Comparison for Uploading File to cloud over Internet Speed in Mbps and Time in Milliseconds

CONCLUSION: -

This paper describes different application models are used to offload the data into cloud. Based on framework cloud security model benefits requirements such as security and privacy to satisfy the condition based on cloud and protect them against various threats. In future research should be towards, managing risk in cloud computing is challenging process. Security for clone is use to secure from illegal access and preventing smartphone from various threats. To handle

this new mobile cloud application framework is required. The mobile cloud transfers from mobile to cloud. The cloud computing give the basic concept related to cloud storage, security, term involve the architectural diagram and algorithm related to cloud and mobile cloud. The architecture uses to manage energy consumption memory storage and consumption of battery.

In future we require maintaining high network connection and comparison should be done between previous and latest method.

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