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HTTP Streaming For Transferring Hypertext and Hypermedia Information Based On Mobile Node

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Abstract: **In last decade an instruments called mobile phone being part of human. Today every one required application is based on mobile. Due to new innovation in technology, mobile phone becomes Smartphone that built on mobile operating system with more computing capability and connectivity. Smartphone allow user to install and use mobile application. Streaming is a method of transferring digital data with real-time characteristics in such a way that the recipient can view the content continuously while receiving the data. On the Internet, streaming has been a common technology for delivering audio and video content for years. Recently it has also become available for mobile phones. One of the most interesting, but also most demanding and challenging of these services is the streaming of multimedia content. Recently it has also become available for mobile phones. Today all the daily work become online, for that we required that applications such as money transaction, e billing, e shopping like eBay, different mobile widget like social networking site face book, twitter etc. also available in Smartphone. Today Mobile Application become more and more advance with the advance technology of mobile computing so, My objective of research to find the HTTP Streaming Based on Mobile Node in the field of Mobile Application development so, that a smart mobile phone able to perform task using Mobile Augmentation that it was not performed due to hardware constraints, n/w constraints or s/w constraints.**

I. Introduction

In last decade an instruments called mobile phone being part of human. Today every user wants to use mobile application. There are number of useful application like face book, email, dictionary, weather/commodity information, and kitchen guide etc. available on each and every mobile phone. Today the mobile is not only calling instruments, but its serve a lot. Today there are trends of smart phone. By using the smart phone a developer can develop many applications that can be run on given application environment and user of the Smartphone use that application. Mobile Application provides features called custom or user defined functionality in Mobile Phones.

Mobile Computing is a human-computer interaction and also describes how the mobile devices can communicate with other mobile devices. It provides ability to use computing capability without a pre-defined location and/or connection to a network to publish and/or subscribe to information.

Today Mobile Application become advance and advance it can integrate a number of field of mobile computing like wireless network , Mobile Web Technology, GSM, GPRS and more. The different capabilities of smart phone make new challenges in mobile application development on which different mobile platform having different capabilities and mobile application are highly depends on platform for which application is created.

The most popular mobile operation systems or platforms are: Android,, Symbian, Windows Mobile, iPhone, Brew, Black Berry, etc. Combining the various capabilities provide by mobile phones, mobile applications begin to flourish with the support of these platforms.

II. Related Work

There are various mobile operating system and platform for developing and executing mobile application. Mobile Platform for smart phone are limited for their memory usage, processing power and limited API. Any Window Application can't build as mobile application. The main problem and challenging task in mobile application development is that how to create application when API to develop a specific process is not available.

The JAVA JMF API is available for pc environment so, a mobile streaming application is not built using JMF API. And the JAVA ME MMAPI supports function for multimedia playing but it do not have function for streaming media. There is also no any API available in JAVA ME to built streaming application.

III. Mobile Operating System

This topic will cover an analysis of the mainstream operating systems for mobile terminals. Most of Operating Systems are Mobile company dependant and they have different functionality and popularity.

iOs

iOS is mobile operating system developed and use by Apple. . The"Core Animation" software component from Mac OS is also included. The OS is capable of supporting bundled and future applications from Apple, as well as from third-party developers.

iOS 7 is the seventh version of Apple's proprietary mobile operating system for iPhone, iPad and iPod Touch. Like earlier versions, iOS7 is based on Macintosh OS- X and supports multi-touch gesture recognition for user actions including pinching, tapping and swiping.
Development of the iPhone OS is controlled by Apple in all aspects. As an iPhone is an expensive product in a market compare to other competitors. As of today it seems iPhone to be the most popular smart phone available.

Android

One of the most widely and currently used mobile OS these days is ANDROID. Android does a software bunch comprise not only operating system but also middleware and key applications. Android was founded in Palo Alto of California, U.S. by Andy Rubin, Rich miner, Nick sears and Chris White in 2003. Later Android Inc. was acquired by Google in 2005. After original release there have been number of updates in the original version of Android.

The Android OS isn't made in Java, but the application development for Android is in Java. Android is based on a Linux kernel with user space and JVM for Android (Dalvik) being written in C. The OS is fully open source.

Multi-tasking functionality is an important and powerful feature of Android. Launching applications into the memory is very slow (several seconds), but are quickly fetched from the cache again.

This is Google's vision in general and why the Google Chrome OS is based mainly on the concept of cloud computing. Android does support the full Adobe Flash and the newest version even support Adobe Flash.

Symbian

The Symbian OS is the most popular mobile OS in the world. Symbian was used by many major mobile phone brands, like Samsung, Motorola, Sony Ericsson, and above all by Nokia. It was the most popular smart phone OS on a worldwide average until the end of 2010, when it was overtaken by Android are using Symbian as well, but the future of Symbian has heavily been influenced by the decisions of Nokia.

Blackberry

The Blackberry OS and development platform is developed by the Canadian company Research-In-Motion(RIM). The OS is providing a platform for doing application development supporting J2ME. The Blackberry Java Virtual Machine (JVM) is based on Sun's implementation of the J2ME being written partly in C, C++ and assembler. The previous operating system developed for older BlackBerry devices was BlackBerry OS which is a proprietary multitasking environment developed by RIM. The operating system is designed for use of input devices such as the track wheel, track ball, and track pad.

The OS provides support for Java MIDP 1.0 and WAP 1.2. Previous versions allowed wireless synchronization with Microsoft Exchange Server email and calendar.A new operating system, BlackBerry 10,was released on January 30,2013.

Windows Mobile

Windows Mobile OS is a proprietary and not open source OS originally created to be a mobile version of Windows with a user interface compliant to the Current Windows version. It is based on the Windows CE kernel, which most hardware specific components are offered as open source. Windows CE is a minimalistic real-time multi-tasking OS that can run in less than a megabyte of memory.

IV. Software Development Platform

J2ME Technology

J2ME (JAVA Micro Edition) is by far the most popular application development platform. J2ME is a collection of technologies and specifications to create a platform that fits the requirements for mobile devices such as consumer products, embedded devices, and advanced mobile devices. It is a collection of technologies and specifications that can be combined to create a complete Java runtime environment specifically to fit the requirements of particular mobile devices. It was designed by sun micro system, acquired by Oracle Corporation in 2010.

The configuration for small devices is called the Connected Limited Device Configuration (CLDC) and the more capable configuration is called the Connected Device Configuration (CDC). The J2ME handset support automatic memory management and a rich set of easy-to-use APIs, J2ME is designed to boost developer productivity. Device support for J2ME also presents the biggest technical challenge for J2ME developers the problem of porting an application to a variety of devices.

iPhone Technology

iPhone is a very popular handsets with developers and users alike. With millions of users, iPhone is a popular device for mobile development. The iPhone is designed and marketed by Apple Inc. Its minimal hardware interface lacks a physical keyboard, so a virtual keyboard is rendered on the multi touch screen instead.
The iPhone is capable of supporting bundled and future applications from Apple, as well as from third-party developers. Software applications cannot be copied directly from Mac OS X but must be written and compiled specifically for iPhone OS.

Android Technology

Android is technology with endless possibilities. Today it runs mobile phones and tablets, tomorrow it might run our world. Will you be the one to make it happen? Android is a software platform and operating system for mobile devices, based on the Linux kernel, and developed by Google. Android also gives you tools for creating apps that look great and take advantage of the hardware capabilities available on each device. It automatically adapts your UI to look its best on each device, while giving you as much control as you want over your UI on different device types.

Windows Mobile

Windows Mobile is a family of mobile operation systems developed by Microsoft for smart phones and Pocket PCS. There are three main versions of Windows Mobile for various hardware devices:

Windows Mobile Professional that run on smartphones with touch screens.
Windows Mobile Standard runs on mobile phones without touch screens
Windows Mobile Classis which runs on personal digit assistant or Pocket PCs.

V. Characteristics of a Mobile Application Architecture

Connectivity

An application designed for mobility should enable users to access data and conduct operations whether online or offline. When working offline, the user still perceives that the shared data is available for reading and writing. When network connectivity is restored, local data changes are integrated into the network copy of the data and vice versa.

Security

Security has several facets. The data transferred over the network must be encrypted through the carrier network. As some Apps sync data with online, web-based applications, the storage of this data on the server must also be secured. Another aspect concerns the data on the device itself. I don't want anybody playing around with my mobile phone getting access to my bank account data. Mobility is delicate, and so is the date aggregated and generated in this context.

Multi-platform support

An application designed for mobility should be platform independent. It will support and executed for different hardware supported device.

Power and Performance

An application designed for mobility should closely manage its use of the limited power of a portable device and give better performance.

VI. Component based Mobile Application Development

Generally Mobile application development is divided into three methods.

The *First Method* to develop project on one platform and execute on multiple operation system. This can be achieve by changing the fraction of code, so that it can be run on particular OS. This method is generally not adopted due to there are number of operation system and require do respective programming.

The *Second Method* is developing software using platform independent languages. Java language is widely used for this purpose due to its "write once and run anywhere " feature.

The *Third Method* is cross-platform module combination. It is widely adapted for development of new software. It divide software into module according to their functionality and Test them separately according to requirement.

Considering the current methods of cross-platform mobile application development, Mobile application development is divided into Application Layer, JS Engine Layer, Component Layer and OS Layer. Component layer provide a unified interface to the upper layer, to achieve the purpose of mask the underlying operating system differences.

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Application Layer

Mainly adapt with Ajax technology, Ajax means the combination of Asynchronous JavaScript and XML. JavaScript is a kind of lightweight language, user interface designed is colorful with the help of JavaScript and CSS. XML means extensible markup language, the same to HTML. Application layer should be divided into several modules depend on the specific requirements of the application. These modules can be developed by different teams.

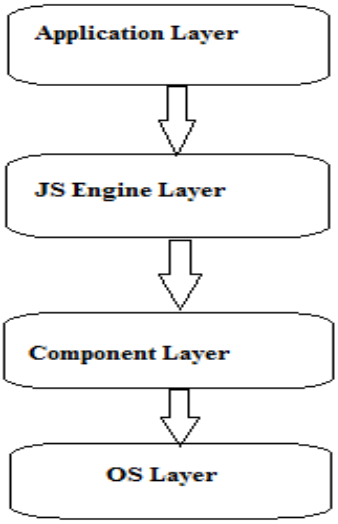

Figure 1: Component based Application Development

JS Engine Layer

This layer is aim to parse the JavaScript code of application layer. The process of parsing is to map the methods and properties of script with matched interface of component layer, to implement specific function by these component interfaces.

Component Layer

This Layer is the core of component-based cross-platform of mobile application development, it support application layer with unified interface by parsed through JS Engine Layer, mask differences of underlying operating system in this layer. The interfaces packed in component are implemented on designated platform: include Networking, Graphics, File System, Store Manage and System Service component.

OS Layer

This layer is a set of different mobile operating system, such as Windows Mobile, Symbian, iPhone, Palm, Android and so on, each kind of OS support related SDK and API document.

VII. Mobile Streaming

Streaming is a method of transferring digital data with real-time characteristics in such a way that the recipient can view the content continuously while receiving the data. The data can be basically any content, like audio and video content.
The advantage of streaming is that it makes possible for the recipient to start viewing the content almost immediately, and the entire content does not have to be downloaded and stored on the client device.

The disadvantage is that the quality of a presentation is highly constrained by the network. A stream is a flow of data packets containing media content. The packets are normally generated by a streaming media server from an arbitrary data source, which can be media content stored on the server or captured from a live source. Streaming of previously stored data is called on-demand streaming, while streaming of live content is called live streaming.

The generated data packets are continuously sent to the recipient over a packets witched network using some streaming protocol. The recipient is running streaming media player software, which receives the packets, decodes the content data with an appropriate codec, and finally shows the presentation to the user.

VIII. Streaming Protocols

There are some protocols are available for streaming applications. Some of the protocols are targeted for initializing and controlling streaming sessions, while others are transport protocols for transferring the actual data.

Real-Time Transport Protocol (RTP)

Real-time Transport Protocol (RTP) provides functions for end-to-end transport of real-time data, such as audio, video, multimedia, or other content. RTP supports both uncast and multicast transmissions. RTP is only a transport protocol, and thus it does not guarantee any quality of service for the transported services. RTP is independent of the underlying transport protocols and networks, but when it is used for streaming audio and video content in IP networks, it is usually transferred over UDP/IP protocol.

Real-Time Control Protocol (RTCP)

Real-Time Control Protocol (RTCP) is used in association with the RTP protocol to provide feedback on the quality of the transport, and for adding minimal identification and control functions. RTCP uses the same distribution channel as RTP, so the underlying transport protocol must provide some kind of multiplexing for the RTP data and the RTCP control packets.

Real-Time Streaming Protocol (RTSP)

Real-Time Streaming Protocol (RTSP) is an application-level protocol used for establishing and controlling either a single or several time-synchronized streams of continuous media content, such as audio and video. RTSP is not typically used for delivering the payload data itself, although it is possible. To interleave the payload data with RTSP, usually protocols such as RTP are used. Basically RTSP can be thought as a "network remote control" for multimedia servers.

RTSP protocol is a text-based protocol resembling Hypertext Transfer Protocol (HTTP), but there are also some major differences. The biggest differences are that RTSP is not a stateless protocol like HTTP, since an RTSP server has to maintain its state in almost all cases, and that both the server and the client can issue requests. RTSP is highly independent of the used transport protocol and thus the RTSP session is not related to e.g. TCP, UDP or other connections used for the transportation.

Hypertext Transfer Protocol (HTTP)

HTTP is a stateless, text-based, application-level protocol intended mainly for transferring hypertext and hypermedia information. Due to the protocol's generic nature, HTTP can also be used for other purposes, such as file transfers. In streaming, HTTP is widely used for finding and browsing media content and delivering the streaming session descriptions. HTTP can also be used for transporting media content, although it can be more likely thought as progressive downloading than streaming.

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