

Study on New Operating System for Smartphones Firefox Operating System

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Abstract— The influence of mobile devices in today's generation is increasing continuously. The general purpose OS running on desktop machines are different from mobile operating system in design and capabilities. [7] The Symbian operating system is one the mobile operating system that was used in many mobile brands. The features and architecture of symbian OS are briefly described and also the owners of this OS are described in this paper. Firefox OS Mozilla is making a development of HTML5 based mobile platform. Mozilla introduced a number of mechanisms that make the security landscape of Firefox OS distinct from both the desktop web and other mobile operating systems. From application security point of view two important mechanisms are introduced as Content security policy and code review. All the excitement about the Costlier iPhone phones are vanishing after the arrival of new open source operating system for Smartphone's i.e. Firefox OS developed Mozilla which is previously well own for their web browsers. Firefox OS is based on wen technologies which are mainly used as open standard techniques HTML, JavaScript. Firefox OS is based on Gaia user interface. Due to its low cost and long battery backup Firefox OS will make history in sales.

Key words: Symbian, Firefox os, iPhones, Mobile technology,

I. INTRODUCTION TO MOBILE OPERATING SYSTEM

The Operating system is a basic physical and organisational structure software component of a computerized system. The general purpose OS running on desktop machines are different from mobile operating system in design and capabilities. Mobile operating system is a piece of software that is responsible for management of operations, sharing the resources, coordinating the use of hardware. Popular mobile operating systems are Android, Symbian, iOS, BlackBerry OS and Windows Mobile. Mobile Os helps to identify and define mobile device features and functions. Mobile OS is simple and less heavy and can manage the wireless variations of connections and other inputs as compared to standard OS like windows and Linux etc. It emphasizes communication by running on limited resource (RAM) and central processing unit (CPU). With the growing technology and advancements, the expectations from Smartphone's has increased. The Smartphone's are expected to run for longer period limiting the power consumption.

II. OPERATING SYSTEM FOR MOBILE: SYMBIAN

Symbian was the operating system designed for Smartphone's that was closed source. Originally developed by Symbian Ltd, it exclusively runs on ARM processor. It was the most popular OS until the end of 2010 and was used by many popular brands like nokia, sony erricson etc[8].

A. Features Of Symbian:

1) Application Development:

Symbian uses standard C++ with Qt as the main SDK, which can be used with either Qt creator or Carbide C++. Qt supports the newer edition 5th as well as the older 3rd edition. It also supports maemo and meego. Widgets can be created on S60 platform using portable application framework known as Web Run Time(WRT). Alternative solution for developing application is by using python ,JAVA ME.

2) Multiple Language Support:

In order to support global distribution, manufacturers and third party developers localize their symbian products thereby enabling strong localization support.

The release of symbian known as Symbian Belle supports 48 languages which the popular brand nokia makes it available on devices in language packs. All language packs have English in common.

3) Browser:

Older symbian have default browser-operable browser. It has an inbuilt WebKit based browser and symbian was the first mobile platform to use this browser. [7]The new version of symbian known as symbian Anna was then introduced in nokia which released a new browser with improved speed and improved user interface.

4) User Interface:

Qt framework which is now recommended in other new applications was included in Symbian. Later versions of Symbian planned to introduce a new GUI library framework which was specifically designed for a touch-based interface, named as "UI Extensions for Mobile" or UIEMO. It was built on top of Qt Widget.

III. OWNERS OF SYMBIAN

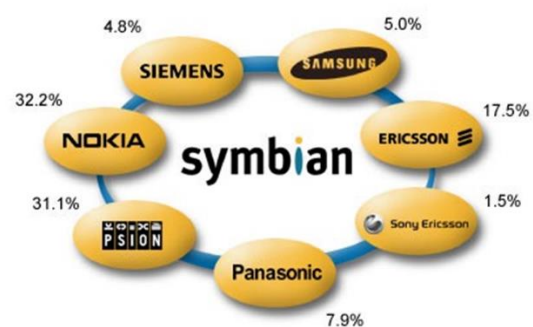


Fig. 1: Owners of Symbian

IV. ARCHITECTURE OF SYMBIAN OPERATING SYSTEM

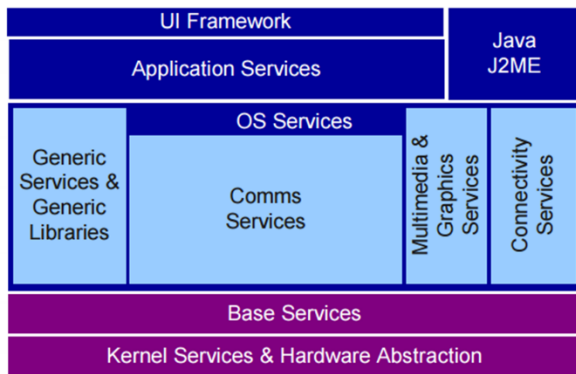


Fig. 2: Architecture of Symbian operating system

The goal of the model is to establish manageable granularity on the operating-system architecture, so that it becomes easier to understand and to navigate. One reason for showing the system as layered is to show how system functionality is withdrawn from hardware (at the bottom) towards users (at the top).

Within each layer, components are either grouped directly into collections on the basis of functionality or are grouped into collections within blocks and possibly sub-blocks, which are broadly based on technologies[7]. The All over Model contains layers as shown above in the diagram, from top to bottom:

The Base Services Layer is the lowest level that is reachable by user-side operations; it includes the Store, Central Repository, File Server and User Library, a Plug-In Framework which manages all plug-ins. It also covers Text Window Server and the Text Shell..

Symbian basically has a microkernel architecture to maximise robustness, availability and responsiveness. It also contains a scheduler, memory management and device drivers, but other services like networking, telephony and file system support are handled by Base Services Layer. The kernel is not a true microkernel if device drivers are included. Symbian is designed to focus on compatibility with other devices, especially removable media file systems. The internal data formats mostly rely on the same APIs that usually creates the data due to which all file manipulations are done. This has now resulted in data-dependence and problems in changes and data migration.

There are three main servers in a large networking and communication subsystem: ETEL (EPOC telephony), ESOCK (EPOC sockets) and C32 (responsible for serial communication).Plugin-In schemes are included with each of them.

There is also a large volume of user interface (UI) Code. The base classes and substructures were handled by Symbian OS, while the actual user interfaces were handled by third parties. This is no longer the case. The three major UIsS60, UIQ and MOAP, contributed to Symbian in 2009. Symbian also contains graphics, text layout and font rendering libraries.

All native Symbian C++ applications are mainly built up from three framework classes defined by the application architecture: an application class, a document class and an application user interface class.

Symbian also includes a reference user-interface called "TechView." It provides a basis for starting

customization and is the environment in which much Symbian test and example code runs

V. INTRODUCTION TO FIREFOX

Firefox is Linux kernel based open source operating system which is used in smartphones and tablet Computers and in smart TVs also. It is being developed by Mozilla, the best organization known for the Firefox web browser. On Android-compatible smartphones, Firefox OS was publicly demonstrated in February 2012.[1][2] By December 16, 2014, 14 operators from 28 countries were offered Firefox OS phones throughout the world.[3] On December 8, 2015, Mozilla later announced that Firefox OS smartphones would be discontinued by May 2016 as the development of "Firefox OS for smartphones"[5] would cease after the release of version 2.6. Around the same time, it was reported that Acadine Technologies, a start-up founded by Li Gong (former president of Mozilla Corporation) with various other former Mozilla staff among its employees, would take over the mission of developing carrier partnerships, for its own Firefox OS. Firefox OS is designed to provide a complete community-based alternative system for mobile devices, using open standards and approaches such as HTML5 applications (canvas, WebGL, Web component), JavaScript, open web API, to communicate directly with cell phone hardware, and application marketplace. As such, it competes with commercially developed operating systems such as Apple phones, Android, Windows phones and sailfish OS as well as other community-based open source systems such as Ubuntu. The most important part of the Firefox OS is that the entire user interface is a web app. Any modifications you make to the user interface and any applications you create to run on Firefox OS will involve standard web technologies. The user interface of Firefox OS is called GAIA and it includes system functions and default applications. [4]

VI. DEVELOPMENT HISTORY

In July 2012, boot to gecko was given new name which is now well known as 'Firefox OS'. In September 2012, analysts Strategy Analysts announced that Firefox OS would account for 1% of the global smartphone market in 2013. In February 2013, Mozilla declared plans for global commercial roll-out of Firefox OS. Firefox OS devices will be available to consumers in Brazil, Colombia, Hungary, Mexico, Montenegro, Poland, Serbia, Spain and Venezuela. Mozilla declared that LG Electronics, ZTE, Huawei and TCL have committed to making Firefox OS devices In December 2013, also a new features were added with the 1.2 release, including conference calling, silent SMS authentication for mobile billing, improved pushes notifications.[4]

VII. CORE TECHNOLOGIES OF FIREFOX OS

Main three layers are present into Firefox OS as Gonk, Gecko, and Gaia.

- Gaia is an HTML 5 layer and user interface system.
- Gecko is the layout engine and the WBE (Web browser engines) and application runtime services.
- Gonk is the Android-derived underlying OS and Platform is the combination of the Linux kernel and the Hardware abstraction layer from android.

All applications are written with common web technologies as HTML5, CSS, JavaScript and run on top of Gecko. Gecko enforces permission-based access control over applications' access to device APIs. Gaia, provides the core set of applications shipped with a device [6]

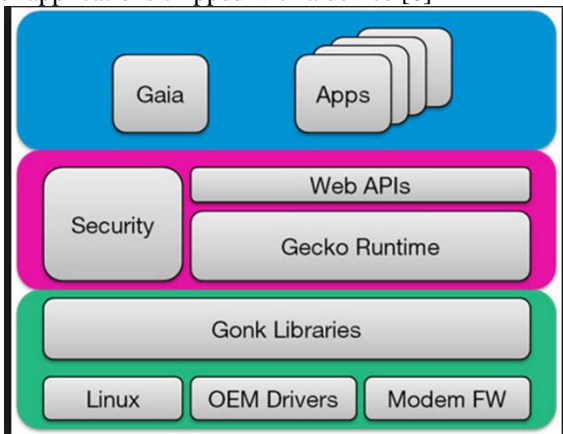


Fig. 3: Firefox OS Layers

- 1) Gaia: The user interface of the Firefox OS platform. Gaia implements the lock screen, home screen, and all the standard applications you expect on a modern smartphone. Gaia is implemented entirely using HTML, CSS, and JavaScript. Its only interfaces to the underlying operating system are through open Web APIs.
- 2) Gecko: This layer that provides all of the support for the trifecta of open standards: HTML, CSS, and JavaScript. It makes sure those APIs work well on every operating system Gecko supports. This means that Gecko includes, among other things, a networking stack, graphics stack, layout engine, a JavaScript virtual machine, and porting layers.
- 3) Gonk: Gonk is the lower level operating system of the Firefox OS platform, consisting of a Linux kernel and user space hardware abstraction layer (HAL). The kernel and several of the user space libraries are common open-source projects: Linux, libusb, bluez, and so forth. Some of the other parts of the HAL are shared with the AOSP: GPS, camera, and others. Gonk is a very simple Linux distribution. Gonk is a porting target of Gecko; that is, there's a port of Gecko to Gonk, just like there's a port of Gecko to OS X, Windows, and Android

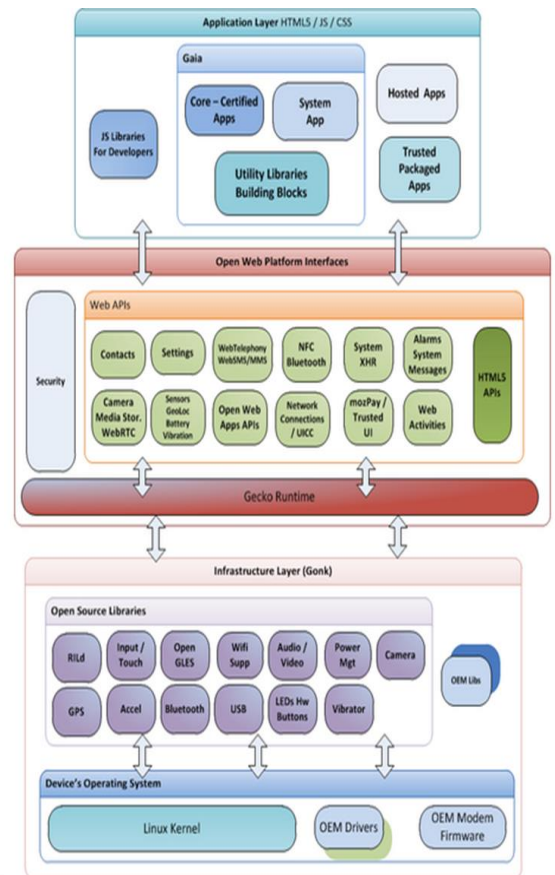


Fig .4: Firefox OS architecture

Problems that Firefox OS Solves?

- 1) They can run smoothly on low end devices.
- 2) Firefox OS hardware will be much cheaper as compare to android and ios. Everyone and afford it.
- 3) Because of the less resource consumption the Firefox OS devices will have longer battery. 4) Web is native platform for Firefox OS in which your phone never gets obsolete. New version of apps will run easily even on your older hardware.
- 4) You are not forced to download apps from Mozilla's market place. You can add any web app on the internet as native app.
- 5) Imagine a word in your mind and try searching it in App Discovery interface of Firefox OS; it will give you high quality chosen apps from all over the internet. [4]



Fig. 5: Firefox OS notification screen

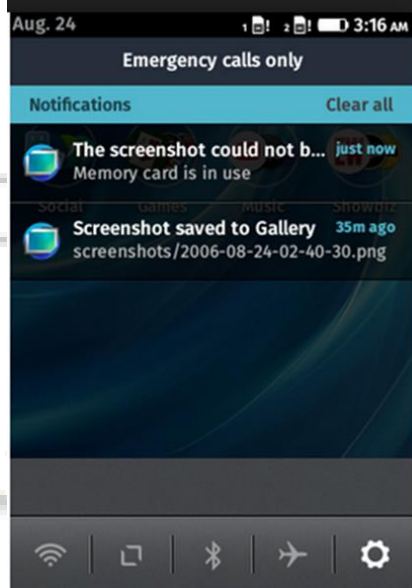


Fig. 6: Firefox OS notification screen

VIII. BEFORE BUYING FIREFOX OS FOLLOWING POINTS SHOULD BE CONSIDERED

Relatively easy use of Firefox OS : In Firefox OS, all the features like call, messaging, calendars, and different Firefox icons are present on home screen whereas android you have to swipe the screen left and right.

- 1) No need to have email Id to operate Firefox OS :- In Firefox, user are required to have their email id to access ,marketplace or operating system where as android phone required Gmail id to access or download apps from Google play
- 2) On Firefox OS there is word written on home screen —I am thinking of it means user can directly search Google and accessing internet on Firefox OS in quite simple and easy
- 3) Supports social networking apps: Firefox supports almost all social networking sites i.e. Facebook, Google, pinterset, twitter.

IX. CONCLUSION

Firstly, we discussed about the symbian operating system used in smartphones. We then discussed the features and architecture of this operating system in detail. we analysed the Firefox is Linux kernel based open source operating system which is used in Smartphones tablet and computers as well as core technologies of Firefox OS. Efforts are to be made in designing of architecture of Firefox OS. Main three layers are present into Firefox OS as Gonk, Gecko, and Gaia. Gaia is an HTML 5 layer and user interface system. Gecko is web browser for Firefox OS which implements open standards for HTML, CSS and JavaScript Gonk is the Android-derived underlying OS and Platform is the combination of the Linux kernel and the Hardware abstraction layer from android. Firefox OS is better and what are the main things we should in keep mind before buying any Firefox OS phones.

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