FIREFOX OPERATING SYSTEMS

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ABSTRACT

The firefox operating system which is also known by its project name- Boot to Gecko (B2G) is mainly an operating system for smartphones and tablet computers and in future it is also used on smart TVs. Firefox os is new to market so, not so many smartphones or tablet computers are running on this os, but in future dozens of smart phones and tablets release on this os. It is an open source mobile operating system that uses modified version of the Linux kernel. It is developed by Mozilla, which is non-profit organization. Mozilla is best known for the Firefox web browser. Firefox OS provide complete community-based alternative system for smartphones, using open standards and approaches such as HTML5 applications, JavaScript, a robust privilege model, open web APIs to communicate directly with phone hardware and application marketplace.

INTRODUCTION

Firefox OS is a operating system and software platform for smartphones developed by Mozilla corporation. It is based on Linex kernel. Firefox OS is open source software stack for smartphones or mobile devices. This OS is little dissimilar from android/iOS. It actually bridges tha gap between feature phones and smartphones which runs on android/iOS. Like android/iOS, firefox OS doesn't have the concept of native applications. All yhe applications on this OS are web based. These applications are created by HTML 5, so these web based applications almost take no time to download. As almost all the applications are web based on this OS so it can run smooth if the ram is low.

On july 25, 2011, Dr. Andreas Gal, the director of research and development of Mozilla announced boot to gecko "B2G" project. This project aims to build a complete standalone OS for the open web. In july, 2012, the project boot to gecko was re-named by Firefox Operating System. The first generation smartphone which has pre-installed Firefox OS was Alcatel One Touch Fire.

FIREFOX OS ARCHITECTURE

Now let's have a look into the architecture of the Firefox OS. The Firefox OS architecture is an integrated technology stack which provides a rich smart phone experience using open standards and web technologies. It is mainly consist of four major software layers

1. Gonk
2. Genko
3. XUL runner
4. Gaia

GONK

Gonk is tha software in the middle which consist of linux kernel and other software libraries. It also consists of user-space hardware abstraction layer (HAL). Gonk is mainly a simple linux distribution that includes mechanisms of Android and is stretched by Mozilla to assimilate with all layers in the Firefox OS architecture. Gonk implies a fusion of open source software and hardware- and OEM-dependent components. Gonk also take cares of B2G processes, like starts, manages, and shuts down processes of Gonk.
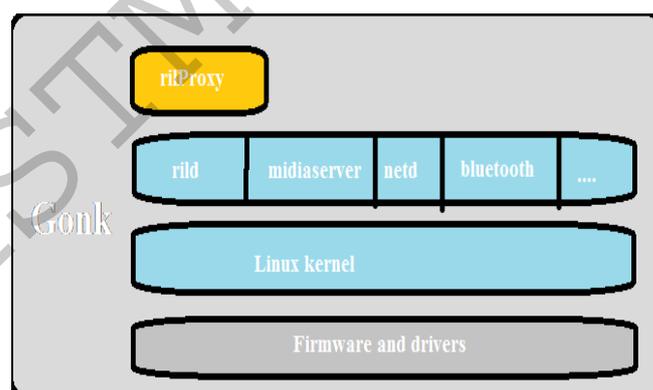
- **Linux Kernel**

  Uses libraries from Android (GPS, camera, etc.) and other open source projects (Linux, libusb, bluez, and so on).

- **Radio Interface Layer (RIL)**

  Interacts with the modem hardware (telephony) in the phone. It is consist of two components:

  rild :- rild daemon talks to the modem firmware

  rilProxy :- It proxies messages b/w rild and processes of B2G

- **mediaserver process**

  Controls audio and video playback. Gecko communicates with the media server through an Android RPC mechanism.

- **Netd process**

  Network daemon that interacts directly with network interfaces (Wi-fi) in the hardware.

Bluetooth,etc.

Bluetooth and other service-level daemons providing access to hardware capabilities.

GENKO

It is the web browser engine of Firefox OS. It is used in various applications developed by Mozilla Corp. It is aimed to support open Internet standards, and is used by different applications to display web pages. In some cases, an application's user interface itself uses Gecko . It offers a rich programming API that makes it appropriate for a wide variety of roles in Internet-enabled applications, such as web browsers, etc.

Some of the standards Gecko supports are as following:

- CSS Level 2.1
- DOM Level 1 and 2
- HTML4 (partial support for HTML5)
- JavaScript 1.8.5
- MathML
- RDF

- XForms (via an official extension)
- XHTML 1.0
- XML 1.0
- XSLT and XPath

XULRUNNER

XULRunner is a run-time engine for XUL. It works as a run-time system for everything written in XUL, specifically any Firefox add-ons. It substituted the *Gecko Runtime Environment.* It stores a wide range of configuration data like bookmarks, cookies, etc. In internally managed SQLite databases. It also offer add-on to manage SQLite databases.

GAIA

Gaia is nothing but user interface application of Firefox OS. When Firefox OS starts up, everything appears on the screen is drawn by Gaia, including the lock screen, home screen, and other applications. Gaia only interface to the underlying operating system and hardware is through standard Web APIs, which are applied by Gecko. Gaia is written totally in HTML, CSS, and JavaScript. Third party apps can be installed alongside Gaia. Gaia can launched these apps which are installed alongside Gaia.
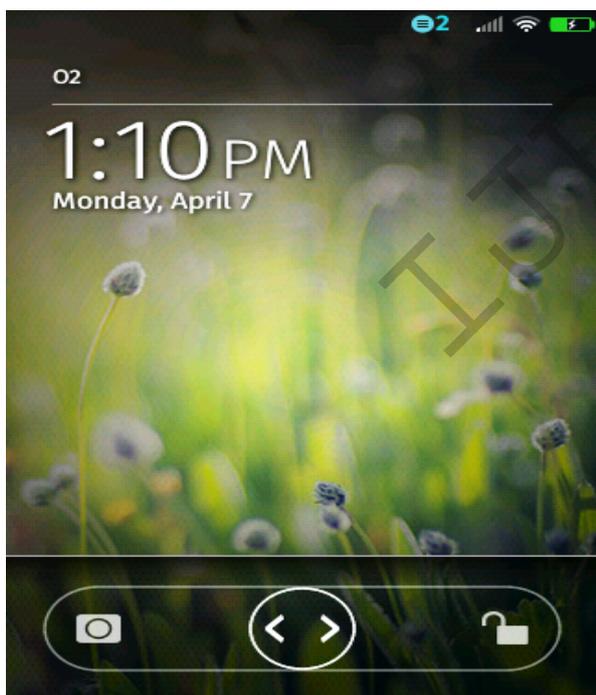
The Gaia lock screen
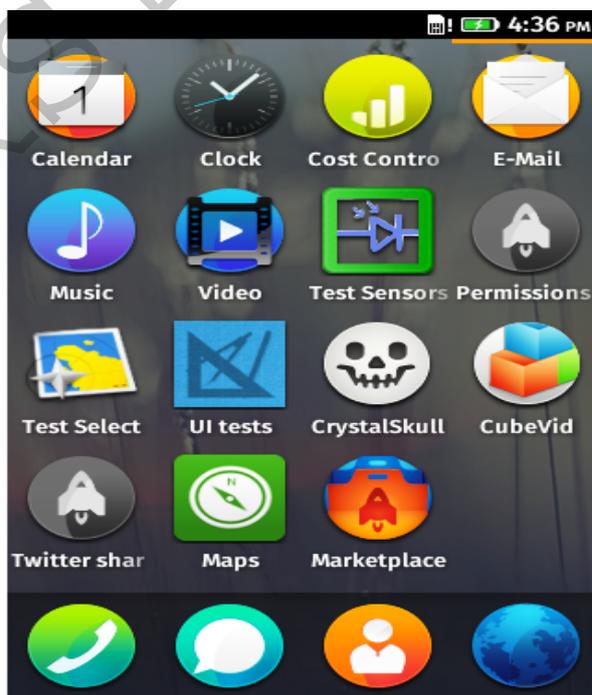
The default Gaia interface

APPLICATIONS

In Firefox OS applications can be classified into Fore the groups listed below

- Platform applications
- Communication applications

- Productivity applications
- Media applications

1. **Platform applications**

    It includes the System app, Browser apps, window management functionality and settings.

System app

It is the 1st web app loaded by Gecko during the Firefox OS bootup procedure. It switches several tasks that are required usually for the running of the system.

Browser

It provides browser-like functionality where it is required — containing page navigation, search and bookmarks.

Window Management

It contains app life cycle and interface, notifications, animations, etc. It is controlled by a specific part of the System app.

Settings

It allows users to configure device settings. It responds to incoming activities, which allows other apps to jump inside the Settings app to handle the configuration as necessary.

2. Communication applications

It Contains the Dialer, Contact, SMS apps and FTU apps.
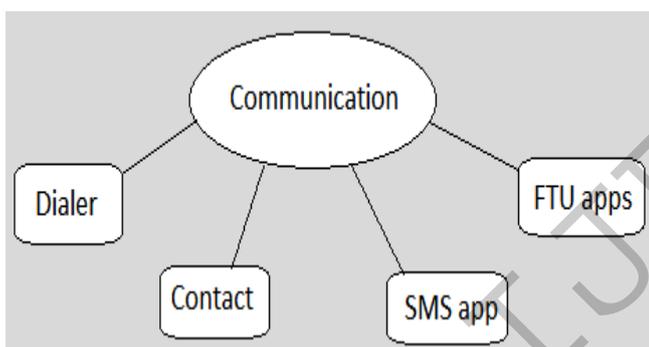
3. Productivity Application

It includes Email, Calendar, and Clock apps.

- **Calendar**

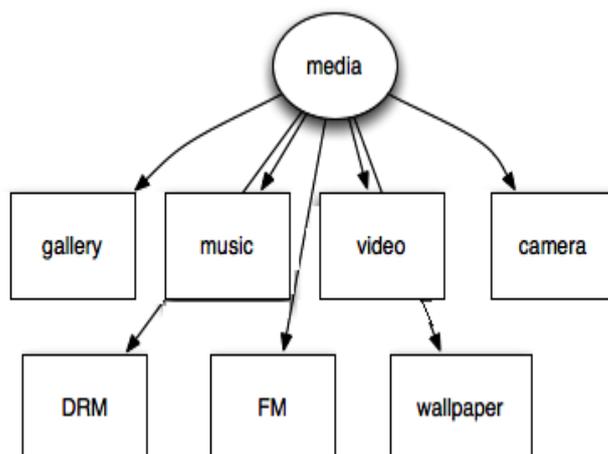It is the built-in calendar app in Firefox OS.

- **Clock**

It is default Clock app in Firefox OS. It includes alarm, timer and stopwatch functionality.

- **Email**

In this e-mail app we can configure our email account.

4. Media Application

It contains some media related functions such as forward lock DRM and wallpapers & some apps like Camera, Gallery, Music, and Video player.

- **Gallery**

It is an exhibition room of images and videos in the phone.

- **Video**

Video is a simple video player app that will play videos present on your device's storage media.

- **Camera**

Camera allows users to capture and manage videos and photos from the device camera. It has some extra features alongside capturing images.

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