Introduction to Firefox OS for developers

Open world, open technologies

Mobile internet is a privilege that not many people in this world get to share. We sometimes forget this in our digital bubble; not realising how much of a luxury it is to have internet access no matter where we are. The majority of world's population lives without smartphones, without the web, and even without simple mobile phones. Firefox OS would like to connect all people to the mobile web and this lofty aspiration is also reflected in the chosen technology. Mozilla is focusing on web technologies that run via the browser, independent of the platform.

You'd like to develop applications for Firefox OS? If so, then here you will find all the information you need at a glance. What are you waiting for? Free the web and do your bit to help supply the world with mobile internet! *#FreeWeb*

The web is the platform.

Mozilla has taken up the cause of promoting innovations in the web and keeping the web open to all. More and more end users are surfing the web on mobile devices. However, because the mobile landscape is fragmented, end users and developers are forced to decide between proprietary ecosystems and their associated possibilities for control and choice. Mozilla would like to liberate the web and bring about standards that make cross-platform developments possible and afford the freedom to choose without constraints.

Firefox OS is a new open-source operating system that creates a platform-independent mobile ecosystem, based on open web standards, so that every feature of a smartphone can be developed with HTML5. The source code is open and the APIs that are to be developed are accessible to all. The system employs a Linux kernel and boots in a Gecko-based runtime engine, with which users can execute applications that have been developed entirely with HTML, JavaScript and other open web application APIs.

How to get started…

Firefox OS is HTML5. There is no Java, C# or Objective C. Firefox OS gives developers full access to the mobile phone's functionality with HTML5, CSS and JavaScript. A mobile website can be very easily transformed into a Firefox OS application. You just need to define the offline data using *AppCache* and *LocalStorage* or *IndexedDB* and specify the name and access rights of the app in a manifest.

An example manifest:

```
1    {
2      "name": "My App",
3      "description": "My elevator pitch goes here",
4      "launch_path": "/",
5      "icons": {
6        "128": "/img/icon-128.png"
7      },
8      "developer": {
9        "name": "Your name or organization",
10       "url": "http://your-homepage-here.org"
11     },
12     "default_locale": "en"
13   }
```

The offline definitions are needed in any case, so that the app can also be made to run on iOS and Android. If you have an existing HTML5 app in the web, you're only two steps away from joining in with Firefox OS.

1. Create an open app manifest.
2. Registration of the app in the Firefox OS Marketplace or installation out of the app using Web Activities.
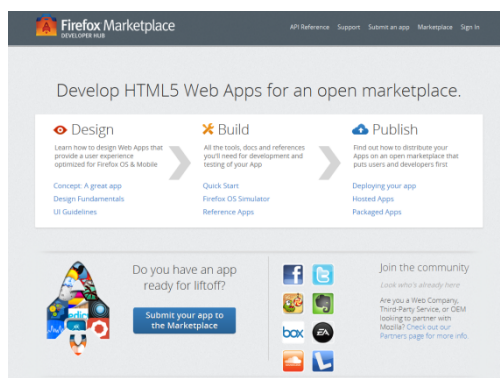
Creation of the app is not bound to a specific IDE or work environment. As is also the case in web development, everything can be used, from VI on the command line, right up to Eclipse; whatever you feel most comfortable with. So far, there is still no defined SDK and developers don't have to register or pay fees. Mozilla's fundamental idea is to keep the web free and accessible for everybody and Firefox OS reflects this.

Security levels for apps

In an open app manifest, the developer defines what the app should be called, which icons are used and which of the mobile phone's functions the app has access to. With Firefox OS apps, there are generally three security levels that define everything the app has "permission to do". This is necessary to ensure, for example, that not every app is allowed to send text messages or make phone calls without the end user's knowing about it. The three different security levels are *hosted, privileged*, and *certified.*

A detailed listing of everything that apps are allowed to do and which security levels are required can be found under https://developer.mozilla.org/en-US/docs/Apps/App_permissions

Put briefly, the various security levels indicate the following:

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Hosted app: This app can be stored on your own server, therefore making it easy to amend and maintain. However, as Mozilla does not manage the server and cannot vouch for its security, the app will only be permitted to access a fraction of the hardware.

Privileged app: This app has greater access, must be certified by the Mozilla Marketplace Team and include a Content Security Policy. Furthermore, privileged apps must have a signature and require installation via the Firefox Marketplace.

Certified apps: These define the functionality of the operating system and can therefore access everything. These can only be created by Mozilla and its partners.

The type of app dictates the web-APIs that may be used.

Web-APIs

Apps in Firefox OS can access the hardware by means of web APIs. Unlike conventional platforms for HTML5, such as iOS and Android, developers have direct access to the various hardware components of the mobile phone via JavaScript. For example, they can read out the battery charge level in percent using window.navigator.battery.level, or make the phone vibrate for one second with a simple window.navigator.vibrate(1000). This functionality is defined as a web-API standard and is also already supported by other browsers.

All apps types are also capable of penetrating deeper into the system, but not automatically; clearance is required from the user. This is what *Web Activities* is for.

Web Activities

A simple way of accessing the phone hardware is to point the end user to the operating system's native apps. For this, there is a further standard: the Web Activities.

The first own app

There are various possibilities for testing the app. The simplest of these works directly from the desktop, using the Firefox OS Simulator add-on. This simulator can be started up easily via the browser |Tools | Web Developer | Firefox OS Simulator. Here, you'll receive a simulated mobile phone with Firefox OS, a console displaying errors and information and the possibility to test apps in Firefox OS from the hard drive. You will get the best results by using Firefox Nightly as your browser. In the meantime, the first Firefox OS smartphones have hit the market, meaning that developers can now test their apps directly on the hardware.

Developers can also launch a new app. The Boilerplate app from Robert Nyman can be used as a basis. This app adjusts automatically to the screen and offers all available Web Activities in the form of buttons in the interface. In addition, the app can also be installed from the web by means of a button, without having to be logged in to the Marketplace.

Earn money with Firefox OS apps

Developers play a decisive role in Firefox OS and should also be rewarded for their efforts. The revenue-share varies depending on the region, payment method, fiscal framework conditions and marketing method. Mozilla supports the direct payment method for operators, such as Telefónica,

which makes it easier for users to buy apps, even if they don't have a credit card. The payout process for developers is dependent, e.g. on the payment method, but also on payment regulations, which differ from one country to the next. However, the objective is to ensure that developers are paid for Marketplace purchases within 60 to 90 days.

Native apps vs. Web apps

"It is difficult to make a direct like-for-like comparison between web applications and native applications. It would be roughly the same as wondering why a family saloon is not as fast as a Formula 1 racing car," says Principal Evangelist, Chris Heilmann.

Twitter: @codepo8

Web applications are independent from platforms and that's what makes them so interesting. Because of this, it is possible to reach a much larger public and they are considerably easier to maintain.

App distribution, Firefox OS Marketplace and adaptive app search

```JavaScript
var installapp =
 navigator.mozApps.install(manifestURL);
 installapp.onsuccess = function(data) {

  // App ist installiert

};

installapp.onerror = function() {

  // App wurde nicht installiert,

  // Fehlerbeschreibung in
 installapp.error.name

};
```

The Firefox Marketplace is an app store, where developers can market apps and users can search for apps. Developers also have the possibility of simply creating apps with an "Install" button in the web.

This allows developers to promote their apps on their own websites. Instead of sending visitors to an app store, they simply switch from the site to the app. This is exactly what happens during an *adaptive app search* in Firefox OS. The search results are the mobile-optimised websites and all required offline data can be downloaded, if the visitor chooses to install the app.

With the *adaptive app search*, the search box doesn't just help users to find the applications on the phone, but also applications in the Mozilla Marketplace and on the web. Rather than having to know the name of the app, you simply search for whatever it is you'd like to have, for example, "Football".

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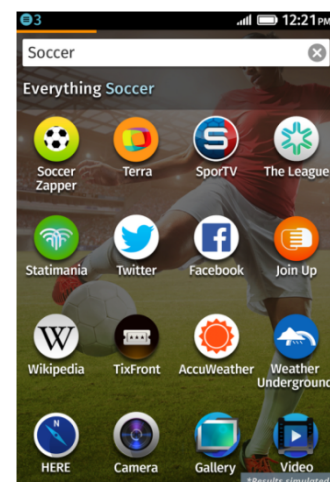
Video series: Firefox OS for developers

In a series of videos produced for developers, Principal Evangelist, Chris Heilmann, explains the most important aspects of Firefox OS. You can find an overview of all videos here. Tune in, now!

1. **Firefox OS:** Chris Heilmann and Daniel Appelquist from Telefónica Digital / W3C talk about the objectives of Firefox OS.

2. **App discoverability**: Mozilla's Principal Evangelist, Chris Heilmann, and Desigan Chinniah from the Firefox OS Business Development Team talk about how easy it is to find and discover apps on Firefox OS

3. **First steps with HTML5 apps:** Chris Heilmann and Daniel Appelquist talk about what you need to keep in mind when developing your first HTML5 app

4. **Firefox Marketplace**: Chris Heilmann and Desigan Chinniah demonstrate how to list and sell your app in the Firefox Marketplace

5. **Web-APIs**: Chris Heilmann and Daniel Appelquist talk about the need for web-APIs

"3 questions to…"

Chris Heilmann outlines what Firefox OS really brings to developers in a mini interview.

Why should developers develop for Firefox OS?

Developers shouldn't develop for Firefox OS; they should develop for the web. Firefox OS is a platform which has HTML5 as its core and doesn't treat it as some kind of extra padding.

The main difference between Firefox OS and other systems is that everything developed for Firefox OS is based on web technologies. Therefore, in the majority of cases, it is possible to develop apps on the desktop using Firefox, or even other browsers, whilst also having access to the excellent developer tools that browsers are equipped with these days. For web developers, this means that we can continue to do exactly the same things we've been doing for years. The difference is that we now have a platform that allows us to communicate with better hardware and that we now have access to functions which were previously closed to us, thanks to web-APIs. With web apps, we have more direct communication with the users. Put simply, web technologies give us developers much greater flexibility.

What aids are available to developers?

Developers can find all the information they need in the [Mozilla Developer Network](). They don't have to download an SDK or use any specific editor and can make use of existing libraries, such as Sencha Touch, jQuery Mobile or Enyo. For some developers coming from iOS or Android backgrounds, it may be a little confusing at first. For this reason, we are working on a "Quasi-SDK", so that non-web developers can quickly put together an HTML5 app using existing components.

The smartphone market is relatively saturated. Is there enough room for another platform?

Well, we're not building a completely new mobile ecosystem. We're making use of something that has already been there for ages — the web. With this, millions of web developers can build apps for Firefox OS without having to learn new techniques. Closed systems have forced developers to develop platform-specific native applications. With Firefox OS, developers have the opportunity to build cross-platform applications, without asking for permission from specific gatekeepers.

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Useful links at a glance:

- [App Manifest](): An open-web app manifest contains the information a web browser needs to interact with an app. This manifest distinguishes the website from an open-web app. It is a JSON file and contains the name and specification of the app.

- [App permissions](): Here, developers can find an overview of what an app is allowed to do and what it is not allowed to do.

- [Firefox OS Developer Hub](): Here, there is detailed information on what a good HTML5 application will look like (with downloadable demos), how you can register and sell your app in the Marketplace and how to install Firefox OS on your own hardware.

- [Firefox OS Simulator](): This is the easiest way of testing your apps. Simply download the add-on and test your applications on the desktop.

- [Firefox Marketplace](): Developers can list and sell HTML5 apps via the Firefox Marketplace.

- [Mozilla Developer Network]() (MDN): MDN is a wiki that allows anyone to add or edit content. There are various tasks to be dealt with, from proofreading to API documentation. Developers can find all required information on Firefox OS here.
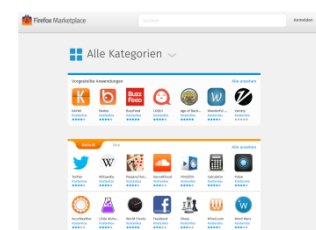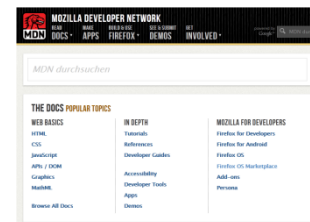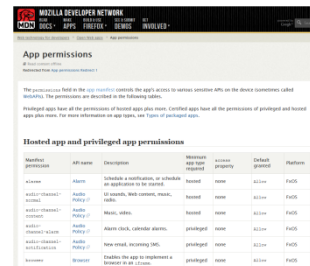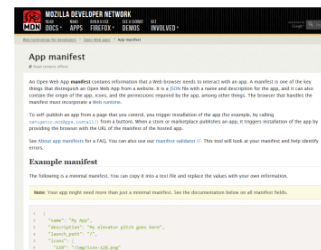
[Firefox OS-Screenshots]() and the [Features Guide]() (PDF, English) can be found in the Press Centre.

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About Mozilla

Mozilla è da oltre un decennio un pioniere e una voce autorevole per il Web. Definiamo e promuoviamo

standard aperti che consentono l'innovazione e fanno evolvere il Web come piattaforma disponibile a tutti. Centinaia di milioni di persone in tutto il mondo utilizzano Mozilla Firefox per scoprire, sperimentare e collegarsi al Web su computer, tablet e telefoni cellulari. Il Web è sempre più importante in ogni aspetto della quotidianità di ciascuno, per questo siamo impegnati a potenziare la scelta, il controllo e la privacy dell'utente, migliorando una piattaforma Web e dei prodotti in grado di offrire esperienze sicure e rilevanti su più piattaforme e dispositivi. Per maggiori informazioni è possibile visitare http://www.mozilla.org/

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