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# **WebExtension Experiments Documentation**

*Release 0.1*

**Add-ons team**

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WebExtensions are a cross-browser system for developing browser add-ons.

WebExtensions Experiments allow developers to write experimental WebExtensions APIs for Firefox. They can be used to prototype APIs for landing in Firefox, or for use on [Nightly](#) or [Developer Edition](#).

If you simply want to request a WebExtensions API, please [file a bug](#). These will be triaged and processed in a [bi-weekly public meeting](#).

Contents:



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## Why?

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WebExtensions Experiments provide a way for developers to tinker with new APIs for WebExtensions. They work by allowing WebExtensions APIs to be written in an another extension. They can be used to prototype APIs for landing in Firefox, or for use on [Nightly](#) or [Developer Edition](#).

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**Note:** If you simply want to request a WebExtensions API, please [file a bug](#). These will be triaged and processed in a [bi-weekly public meeting](#).

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**Note:** If you'd like to land a WebExtensions API straight into Firefox, are familiar with building [mozilla-central](#), working with [Bugzilla](#), the [try server](#), then please [file a bug](#) and follow the usual Firefox development process.

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## Overview

Terminology:

**experiment** A bootstrapped add-on that contains code to expose a WebExtensions API.

**extension** A WebExtension add-on that uses the experiment add-on as a dependency.

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**Note:** The *experiment* and the *extension* are both add-ons. The *experiment* is a legacy style add-on, while the *extension* is a WebExtension.

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Experiments allow you to:

- Test and experiment with an API without having to build Firefox at all.
- Write and distribute the API to a set of users without them having to build Firefox.
- Then commit to (or get help committing to) [mozilla-central](#).

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**Note:** We will not add all experiments to Firefox. The goal is to judge each Experiment on its own merit and value.

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Some key points:

- The API is implemented in the experiment add-on.
- The API is available in the browser namespace - not in chrome.
- Breaking changes could occur in the experiment, but are discouraged.
- WebExtension add-ons using the API depend on the experiment add-on.
- WebExtension add-ons using the API declare its use in the manifest permissions.

### How do they work?

Experiments are a bootstrapped add-on. They have a special `type 256` that tells Firefox that they are an experiment. Firefox loads the `schema.json` into Firefox and then the APIs become available to WebExtensions.

### Where do they work?

Currently experiments can only be loaded in Firefox Nightly and Firefox Developer Edition.

Please see the *Policy* page.

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## Existing Experiments

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This is a list of the experiments primarily from this organisation on [github](#). Since anyone can run an experiment this should not be seen as a definitive list.

### Login

Access to the *nsILoginInfo* object.

**status** **experimenting**

**source** <https://github.com/web-ext-experiments/logins>

**AMO** <https://addons.mozilla.org/en-US/firefox/addon/experimental-logins-api/>

**documentation** <https://github.com/web-ext-experiments/logins/blob/master/api.md>

**addon-id and downloads** [logins@experiments.addons.mozilla.org](mailto:logins@experiments.addons.mozilla.org)

Add-ons using it:

- <https://github.com/andymckay/password-exporter>

### Hello world

A simple example of Hello World which logs to the console.

**status** **example**

**source** <https://github.com/aswan/webext-experiment-hello/tree/master/experiment>

**documentation** <https://github.com/aswan/webext-experiment-hello>

**addon-id and downloads** [simple@experiments.addons.mozilla.org](mailto:simple@experiments.addons.mozilla.org)

Add-ons using it:

- <https://github.com/aswan/webext-experiment-hello/tree/master/extension>

### Trello

This is a list of the experiments from the [WebExtensions roadmap on Trello](#). In cases of discrepancy, bugzilla > trello > this page are the definitive sources.

### Legend

- Done: This experiment is done and merged into mozilla-central.
- Experimenting: The experiment exists and is listed here, but isn't ready into mozilla-central yet.
- In development: Someone is working on it.
- Approved: Sounds like a good idea, someone needs to work on it.
- Thinking about: Still thinking if this a good idea.



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## How to write an Experiment

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An experiment comprises at least three files:

- *api.js*: Your code to implement the API.
- *schema.json*: Defines the API - types, methods, etc.
- *install.rdf*: Install manifest.

The namespace is the value used in the API such as “login” or “media”. This is what developers will use in the API, such as “browser.login” or “browser.media”. The namespace needs to be consistent in all places of the extension:

- *api.js*: `ExtensionAPI.getAPI()` must return an object with a single top-level property: “namespace”.
- *schema.json*: the permissions must be “*namespace*”.
- *install.rdf*: the id must be “*namespace@experiments.addons.mozilla.org*”.

You can see an example of all this in the [boilerplate](#) example where the namespace is “boilerplate”.

### Using the boilerplate

The [boilerplate](#) example provides a simple example that you can download and use in whatever way you see fit.

To get the boilerplate example on Linux or OS X, run the following command:

```
curl -L https://github.com/web-ext-experiments/boilerplate-experiment/archive/master.  
tar.gz | tar xzf -
```

You will then be able to change the example to meet your needs.

### Designing your API

You are free to do whatever you’d like to do in an experiment, but if your eventual goal is to uplift it into Firefox then you should probably read the [Uplifting](#) and [New API Guidelines](#) documentation.

## Installing the experiment

Your experiment can be installed like any other add-on, for example:

- You can zip an `.xpi`, and then install it from `about:addons > Install Add-on From File`.

```
zip experiment.xpi api.js install.rdf schema.json
```

- You can load the `install.rdf` temporarily from `about:debugging > Load Temporary Add-on`.

## Using the experiment

Once you have experiment installed, you can then create a WebExtension using the API provided in the experiment. The only requirement is to add into the manifest of the WebExtension the permission for the experiment.

For example from `logins`:

```
"permissions": ["experiments.logins"]
```

This gives you permission to use the API. But the API might require more permissions, for example to actually use the `logins` API for all urls, you'll need to do the following:

```
"permissions": ["experiments.logins", "logins", "<all_urls>"]
```

Please see the documentation for each experiment to find what permissions you need.

Once you've got an experiment the hope is that it gets merged into Firefox and mozilla-central. But before that happens there's a few things that should happen.

### Adding to github

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**Note:** This is optional.

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### Tell people

The first step is to [file an issue](#) against this repository. In that issue please outline:

- where your experiment is located
- a quick overview of what it does
- any bugzilla bugs that it might address
- if you'd like to move your repository over to this organisation and we can create a repository for you

We'll then include these in our [bi-weekly community triage meeting](#).

There's a few emails and IRC channels that would also like to [know about your experiment](#).

### Updating this documentation

It would be great to add it to this documentation too. If you would like to, please send a [pull request to this repository](#).

## Landing in Firefox

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**Note:** This is optional.

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For it to land in mozilla-central a few things are going to have to happen.

- It should follow the [code quality guidelines](#).
- There should be mochi and xpcshell tests at 100% coverage of the API.
- There should be some documentation on the API.
- There should be a review (even if its just cursory) by the following: the security team, the privacy team, a code review by the engineering team and the UX team (where relevant).
- If the API requires a permission, ensure to land the corresponding permissions string.

For more information on what is likely to be accepted, please check out the [New API Guidelines](#) API Guidelines.

The best way to do this is by filing a bug in Bugzilla and we can start to work through the steps. File a bug under [Toolkit > WebExtensions: Experiments](#) and that process can be started.

## What if it doesn't land in Firefox?

It can still be used by Nightly and Developer Edition.

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## New API Guidelines

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There are some basic principles around WebExtensions APIs as they currently stand. Any API that wants to get merged into Firefox would need to meet these principles.

- Security: the API should not expose an unacceptable risk to the end user.
- Privacy: similar to above.
- Performance: APIs should be async by default and focus on not causing jank, hangs or any sort of bad performance in Firefox.
- Multi-process: all APIs need to be multi-process aware.
- Useful: APIs that land in Firefox should be useful since all APIs have a maintenance burden.
- High level: WebExtensions provide a known public API layer on top of Mozilla code, allowing the underlying code to change quicker and easier.
- Alternatives: Do alternatives exist for example, WebAPIs?

Compared to legacy Firefox add-ons there is a significant sandbox around WebExtension APIs that is very restrictive. Access to privileged APIs within Firefox, preferences, arbitrary File System access, socket access and so on are restricted (at the time of writing this documentation). APIs that break out of this sandbox will need very clear justification for why.

## Triaging APIs

If you file a bug asking for an API it will go through the bug triage process. Since this is useful to how APIs land, here's what currently happens in bug triages:

### Weekly new bug triage

We look at all new bugs in an attempt to spot serious bugs, regressions or other issues. We try to give each bug a priority and mark as *[triaged]* in the whiteboard. The point here is to do an initial triage and catch critical things. We also label

bugs that might be good for contributors or need thinking about. The latter are marked *[design-decision-needed]*, but its important to point out that straightforward change or obvious bugs just go through.

### Bi-weekly community meeting

We look at a number of bugs marked with *[design-decision-needed]* every other week, currently we are doing 6 per meeting, which averages us at 5 minutes per bug. Some take longer. The goal here is to see the use case, understand what the bug is for and if it should proceed. If we are still unsure then it will get kicked “up” to the [Advisory Group](#) for some more help and insight.

### Advisory Group meeting

Where Mozillians with knowledge and insight beyond our group help out with the toughest bugs. Happens about once a month.

### Good first bug meeting

If a bug gets marked as *[good-first-bug]* then we make sure the bug has a mentor, has a decent description and make sense. We hope that contributors will use this to get into Firefox development.

If you’d like to come to some of these triages, check out the

## Examples

#### Bug 1247628

- Was suggested that TCP and UDP should be seperated out and made seperate from the each other. Focusing on TCP should be the first goal.
- TCP support is useful for many add-ons and there should be many examples we could find.
- Code already exists for this in Firefox, this will be just a wrapper around the APIs.
- There were security concerns about these API and would have to be a special permission the user would have to enable (at the very least).

Verdict? Yes, but questions about the security concerns.

#### Bug 1247329

- Concerns about WebSQL as not a successful standard.
- No overwhelming reason to support this.
- There are already many libraries that exist outside of WebExtensions wrap around IndexedDB and give developers access to sane APIs. Local forage is one example.
- Concerns about maintenance of such an API.

Verdict? No.

#### Bug 1215060

- Maybe we could make it an iframe they could inject.
- Should be simple to maintain.
- No real security or performance problems.

Verdict? Yes



## CHAPTER 7

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### Policy

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**Note:** This policy is of Oct 2016 and should be seen as a **first draft**.

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Experiments require Firefox 50 or greater to work.

Anyone can write a WebExtension Experiment, there is no need to ask for permission from anyone to do so.

Currently Experiments can only be run on Firefox Nightly and Firefox Developer Edition. This is to prevent APIs that are generally seen to be experimental being run on release versions of Firefox.

Currently to upload an Experiment to [AMO](#) and get it signed you must be a member of certain group of users at Mozilla. If you are not a member of that group then users can [turn off the requirement for signing](#) on Firefox Nightly



## CHAPTER 8

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### Schema

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What the schema file is and how it works.



WebExtensions Experiments have many similarities to traditional add-ons, therefore a lot of general documentation is already available on [developer.mozilla.org](https://developer.mozilla.org). The following questions and answers are specific to WebExtensions experiments and should help you with common issues.

### How do I get an URI reference to the files in my experiment?

You may need an URI referencing files within your extension, for example to load a frame script when your API methods are being triggered. If you have a file named `browserScript.js` in the root of your add-on, you can reference it using the URI `resource://extension-NAMESPACE-api/browserScript.js`, where `NAMESPACE` is the namespace defined in your `schema.json` file.

### Can I include a `chrome.manifest` in an experiment?

The experiments do not support the `'chrome.manifest'`, and it will be ignored if included in the experiments add-on source directory. If you need an URI which points to assets packaged within the experiment (e.g. an image, an additional `.jsm` file, a frame script, etc.), please read the [question about URI references](#).

If you have any more questions you can't find an answer to please [get in touch](#).

This documentation lives on [github](#), pull requests and issues are welcome.



# CHAPTER 10

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## Indices and tables

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- `genindex`
- `modindex`
- `search`