

Google Developer Day 2009





Developing Google Chrome Extensions

Brian Kennish

November 10, 2009

Google
Developer
Day 2009

Agenda

- Introduction
 - What Extensions Are
 - Why You Should Work on Extensions
 - When the Extension System Ships
- How to Build Extensions
 - Technical Overview
 - Step-by-Step Example
- Summary
- Q&A





Introduction



What Extensions Are

- Programs that modify and enhance Google Chrome's functionality
- Written in HTML, CSS, and JavaScript
- Integrated with browser features using a simple API
- Developed iteratively as webpages



What Extensions Are

- Installed instantly, without a browser restart
- Updated automatically like Google Chrome itself
- Transparent about their cross-origin and browser capabilities
- Run in separate processes like Google Chrome tabs



Demo: Gmail Checker



Shows how many unread messages are in your inbox.

Demo: Gmail Checker



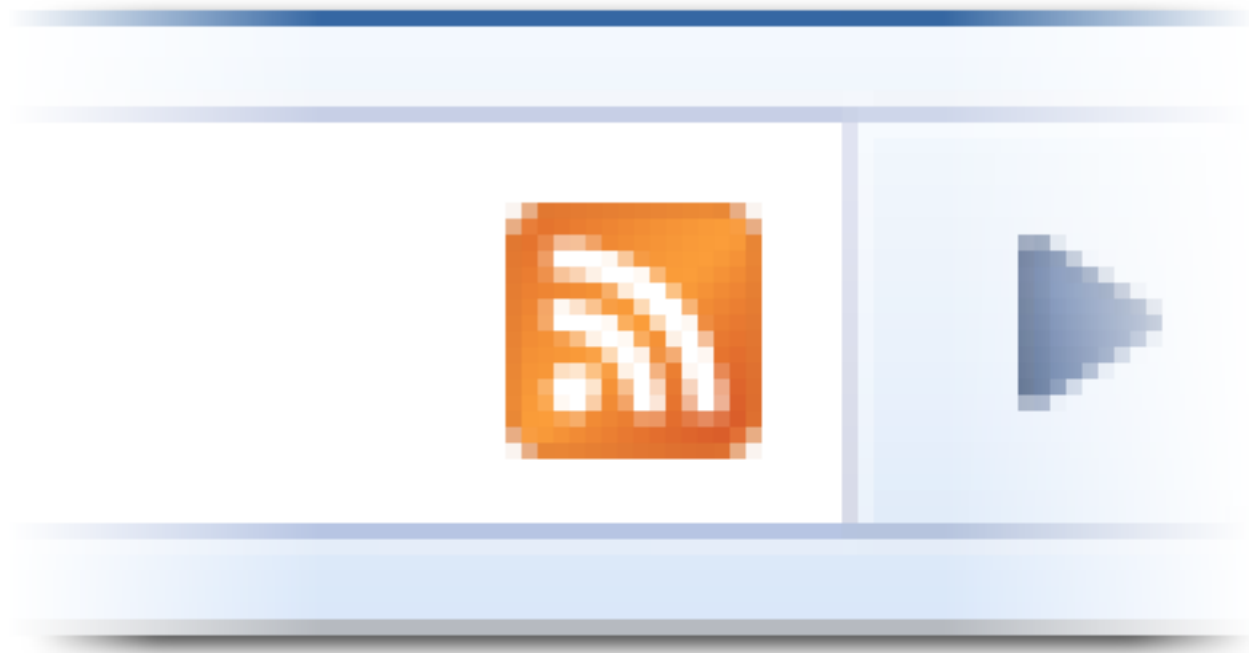
Shows how many unread messages are in your inbox.

Demo: Subscribe in a Feed Reader



Displays a subscription button
when a page has an available feed.

Demo: Subscribe in a Feed Reader



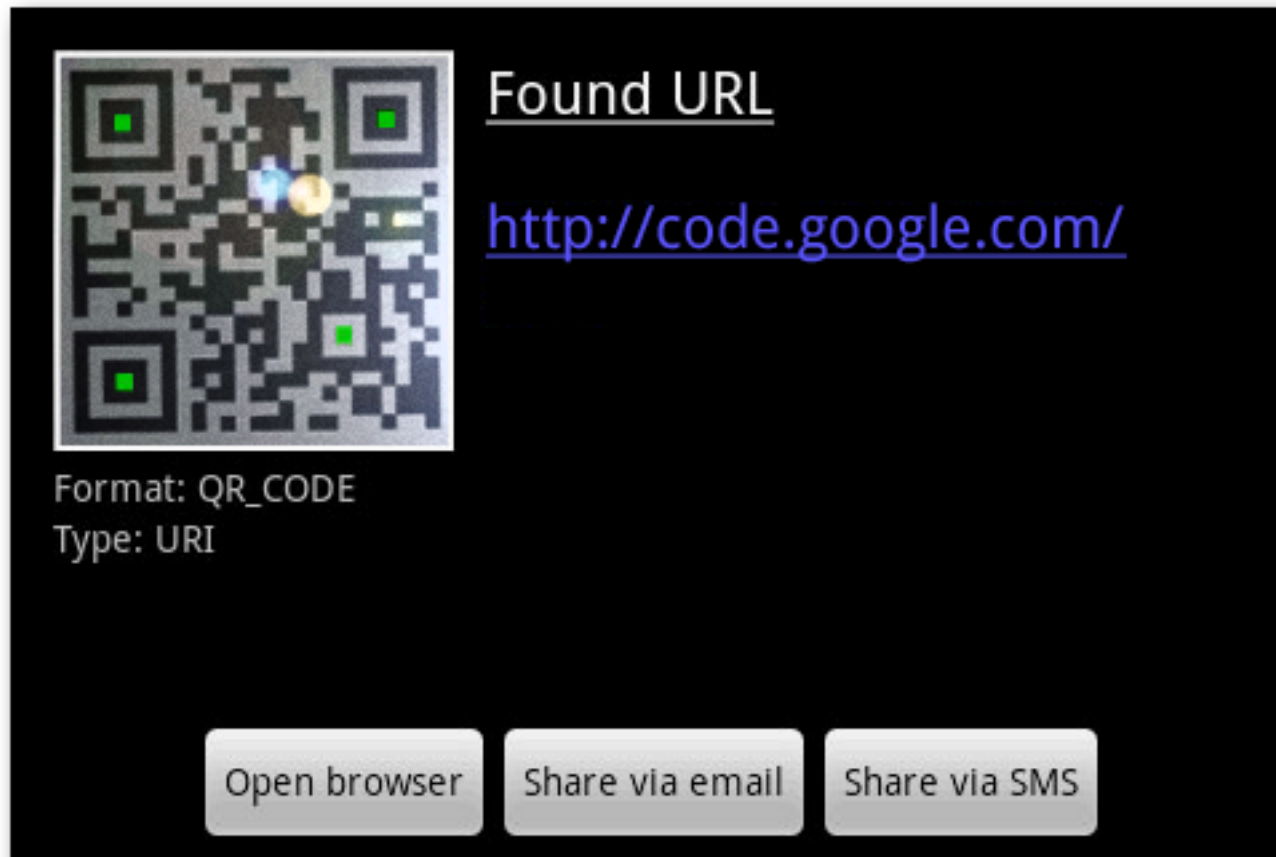
Displays a subscription button
when a page has an available feed.

Demo: Qrome



Turns URLs and other text into QR codes to make them easy to transfer to mobile devices.

Demo: Qrome



Turns URLs and other text into QR codes to make them easy to transfer to mobile devices.

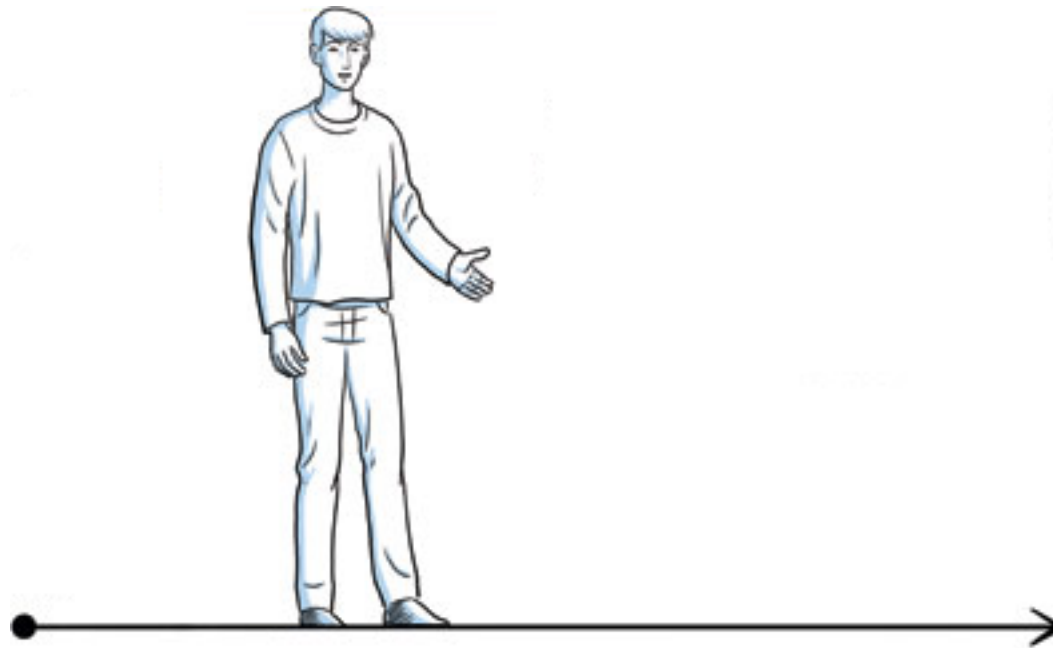
Why You Should Work on Extensions

- Part of an important and fast-growing platform
- Persistent presence on users' machines
- Source of traffic to your site
- Easy and fun



When the Extension System Ships

- In the Google Chrome Dev channel right now
- In the Beta channel later this quarter, along with a gallery
- In the Stable channel soon after



How to Build Extensions



Structure of an Extension

Compressed directory containing:

- **manifest file** (`manifest.json`) — metadata that describes the extension



Structure of an Extension

And at least one of these components:

- **browser action** or **page action** — UI surface
- **content scripts** — CSS and JavaScript injected into pages
- **background page** — long-running script that handles tasks or state
- **utility web files** — additional content



Structure of an Extension

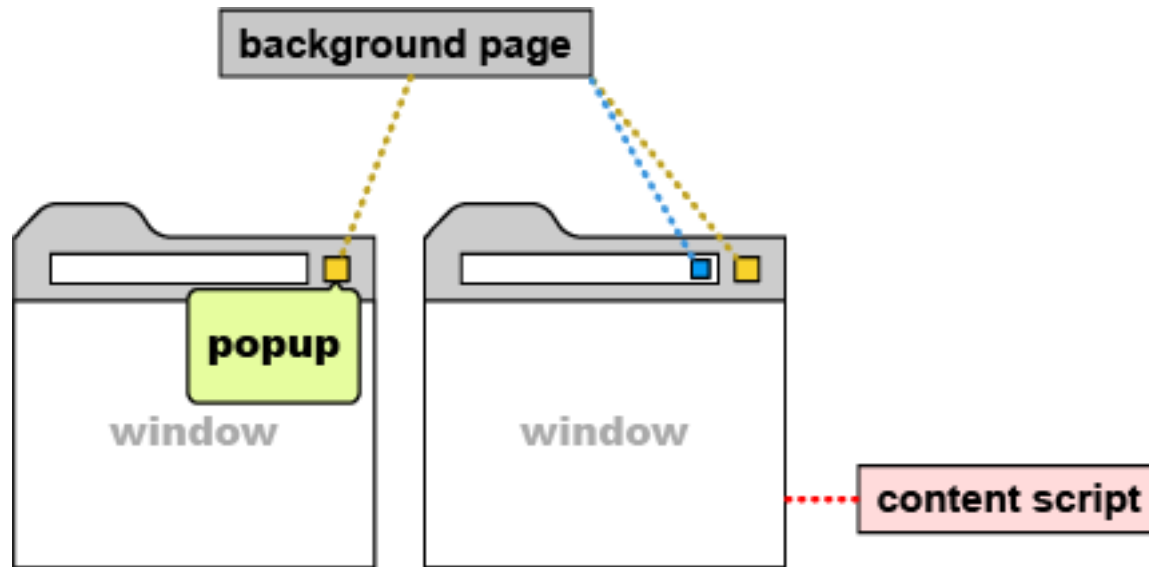
And at least one of these components:

- **plugins** — NPAPI binaries (see <https://developer.mozilla.org/en/Plugins>)
- **theme** — custom browser skin (see <http://code.google.com/chrome/extensions/themes.html>)



Extension Communication

Internal:



External:

- Cross-origin XHR (requires permission)

Layout of the Extension API

`chrome` is the top-level object and exposes:

- `chrome.extension.*` — sends extension messages and resolves the URLs of extension files
- `chrome.browserAction.*` — sets the appearance of browser actions and their badges
- `chrome.pageAction.*` — enables and disables page actions



Layout of the Extension API

`chrome` is the top-level object and exposes:

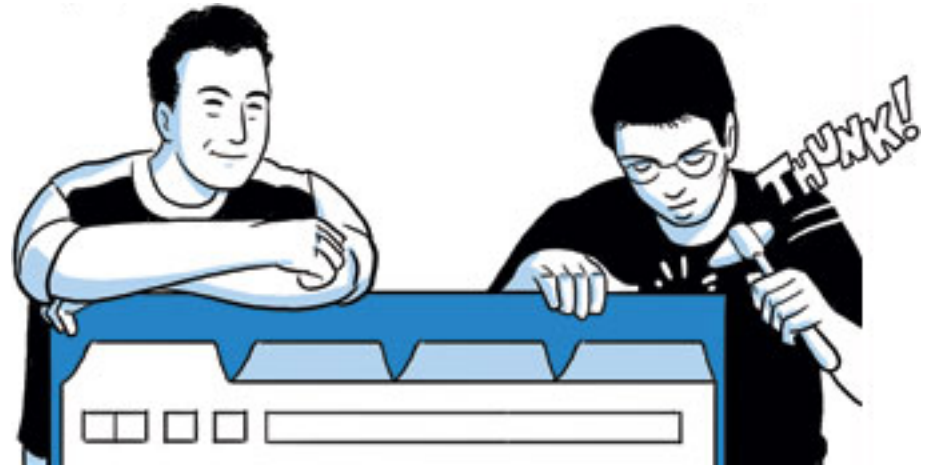
- `chrome.windows.*` — manages windows (requires `tabs` permission)
- `chrome.tabs.*` — manages tabs (requires `tabs` permission)
- `chrome.bookmarks.*` — manages bookmarks (requires `bookmarks` permission)



Other APIs

Extensions can also access:

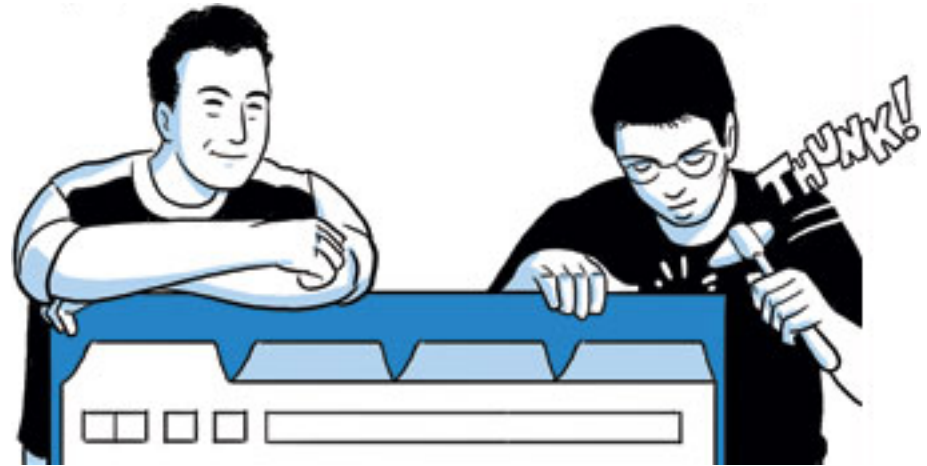
- standard DOM and JavaScript APIs (e.g., HTML traversal and manipulation)
- HTML5 APIs (e.g., localStorage)
- WebKit APIs (e.g., experimental CSS properties)



Other APIs

Extensions can also access:

- V8 APIs (e.g., JSON parsing and stringification)
- bundled JavaScript libraries (e.g., jQuery)
- more (e.g., Google AJAX APIs)



Step-by-Step Example: Chritter



A Twitter button for your toolbar.

Step One

Add UI

```
{  
  "name": "Chritter",  
  "version": "1.0",  
  "description": "A Twitter button for your toolbar.",  
  "icons": {"128": "icon.png"},  
  "browser_action": {  
    "default_icon": "browseraction.png",  
    "default_title": "Chritter",  
    "popup": "popup.html"  
  }  
}
```

manifest.json

Step Two

Fetch Public Data with XHR

```
req = new XMLHttpRequest();  
req.open(  
    'GET',  
    'http://twitter.com/statuses/public_timeline.json'  
);  
req.onload = processTweets;  
req.send();
```

popup.html

Step Three

Refactor Non-Presentation Code

```
var res = JSON.parse(req.responseText);
unreadCount += res.length;

if (unreadCount > 0) {
    chrome.browserAction.setBadgeBackgroundColor({
        color: [255, 0, 0, 255]
    });
    chrome.browserAction.setBadgeText({
        text: '' + unreadCount
    });
}

tweets = res.concat(tweets);
```

background.html

Step Four

Detect Successful Authorization and Fetch *Private* Data

```
// look for oauth_pin
var pin = document.getElementById('oauth_pin');

// send pin to extension
var port = chrome.extension.connect();

if (pin) {
  pin = pin.innerHTML.replace(/^\s*|\s*$/g, '');
  port.postMessage({success: true, pin: pin});
} else { port.postMessage({success: false}); }
```

content.js

Step Five

Autoupdate to a New Version

```
<?xml version="1.0" encoding="UTF-8" ?>
<gupdate
  xmlns="http://www.google.com/update2/response"
  protocol="2.0">
  <app appid="loogiogdnjdgdnmbjdjjbbonkcfpnjdp">
    <updatecheck
      version="6.0"
      codebase="http://localhost/chrutter/6.crx"
    />
  </app>
</gupdate>
```

update.xml

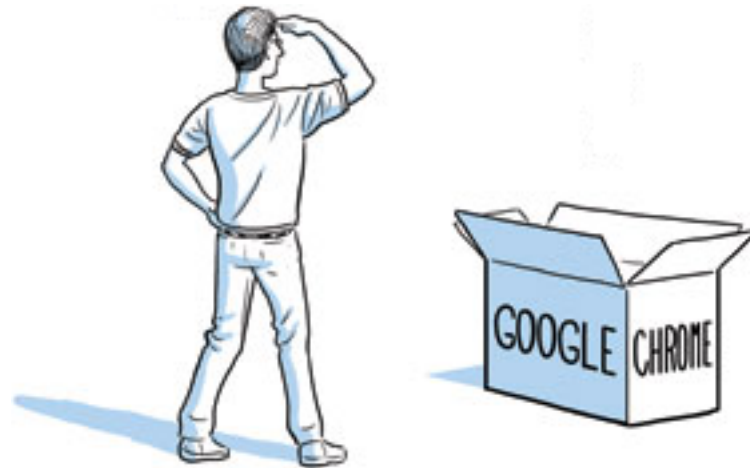


Summary



Key Takeaways

- Small learning curve
- Over 30-million active Google Chrome users
- Upcoming GTUG and similar community events





Q&A



Online Resources

- Documentation: <http://code.google.com/chrome/extensions/>
- Blog: <http://blog.chromium.org/>
- Discussion group: <http://groups.google.com/group/chromium-extensions>



Google Developer Day 2009

