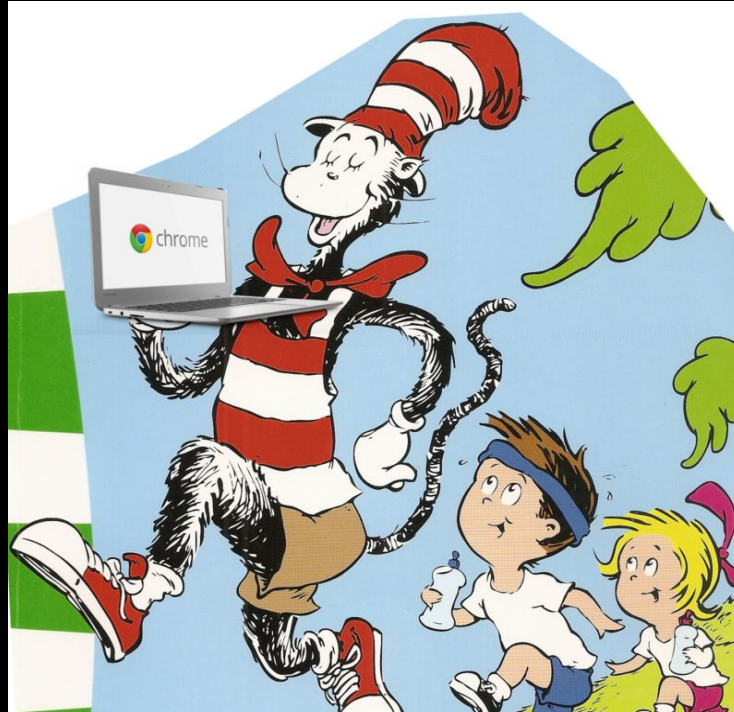


Oh the things you could do
if you had a Chromebook too



Maksim Lin

Freelance Android & Chrome App Developer

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M

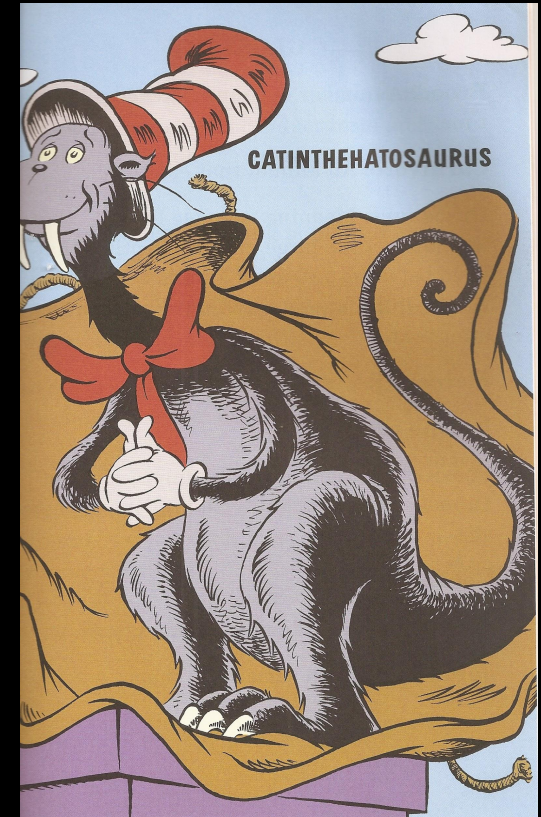
So what are Chromebooks, ChromeOS And Chrome (Packaged) Apps?

Chromebooks (and Chromeboxes, Chromebits) are devices that are *designed* to run ChromeOS

Chrome **Packaged** Apps are apps that intended to be *installed* on Chromeb* devices and may have access to **privileged** Chrome APIs.

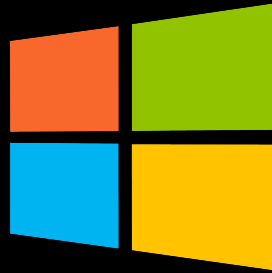
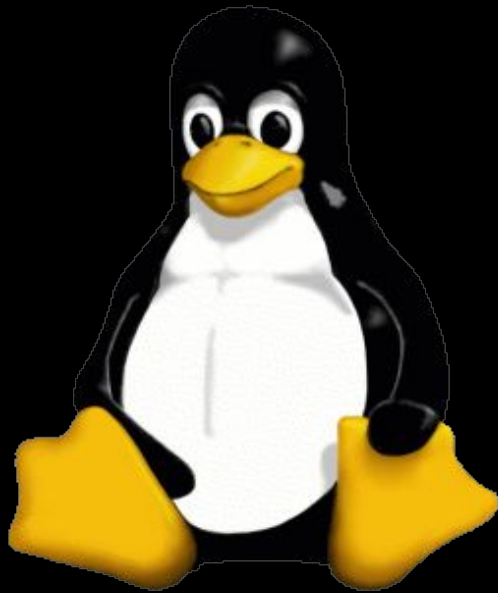
Myths

1. Can only work when online
2. “Just” a web browser
3. Cheap & nasty hardware
4. Locked-in with Google



Chrome Apps **NOT** just for Chromebooks...

Any computer with “Desktop” Chrome Browser



Limited support for mobile via Cordova wrapper

Apps vs Extensions

- ★ Extensions act on browser pages
- ★ Apps intended to be stand-alone “apps”
- ★ Different APIs / Permissions

APIs !!!!!!!!!!!

Access to:

- ★ ***ALL*** device storage (aka local disk!)
- ★ Devices: Sockets, USB, Serial, Bluetooth, BLE
- ★ Alarms, Notifications, Power Mgmt
- ★ Push Messaging

Limitations



- ★ CSP prevents **Eval**, making difficult for module loading, runtime compilers, etc
- ★ Limited IPC, nothing like Android Intents
- ★ Some APIs not very featureful (eg. File API nothing like POSIX)

DIY **(ChromiumOS)**

Open source version of ChromeOS

BYO hardware...

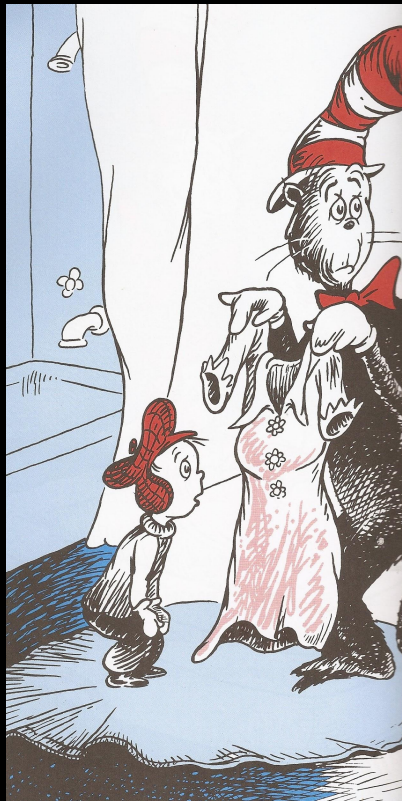
★ **Cloud Ready**

(Commercial, Free for Personal Use)

★ **Arnold The Bat**

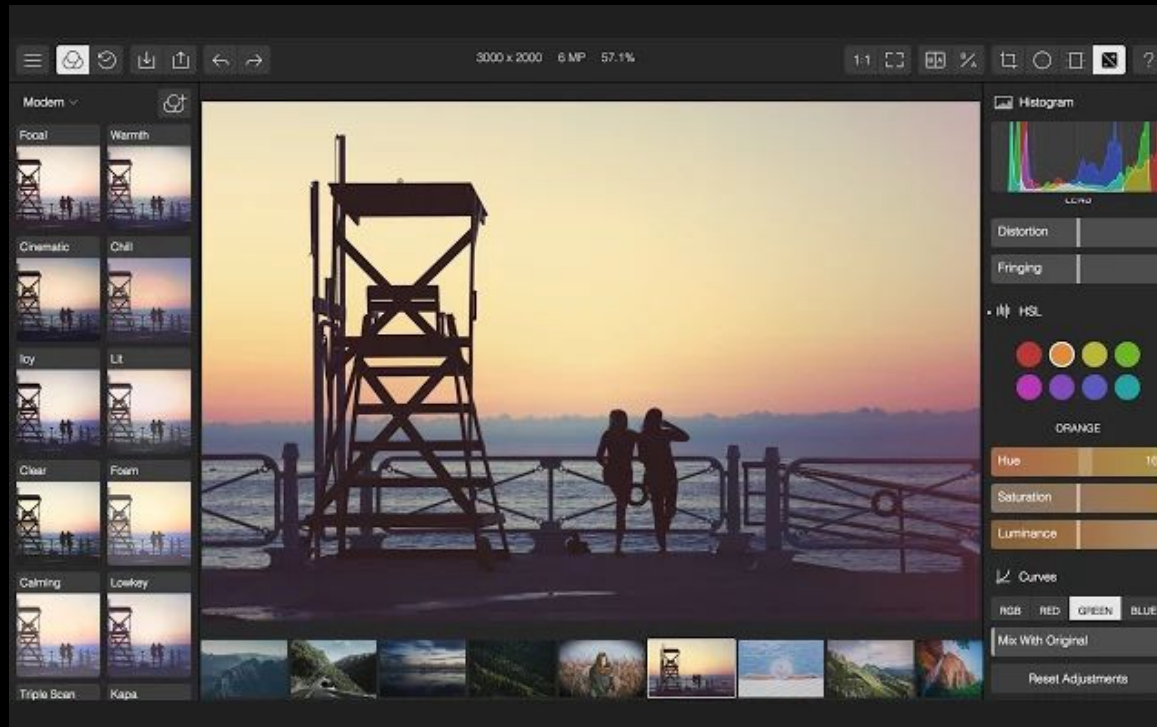
(Hobbyist)

Examples & Demos...



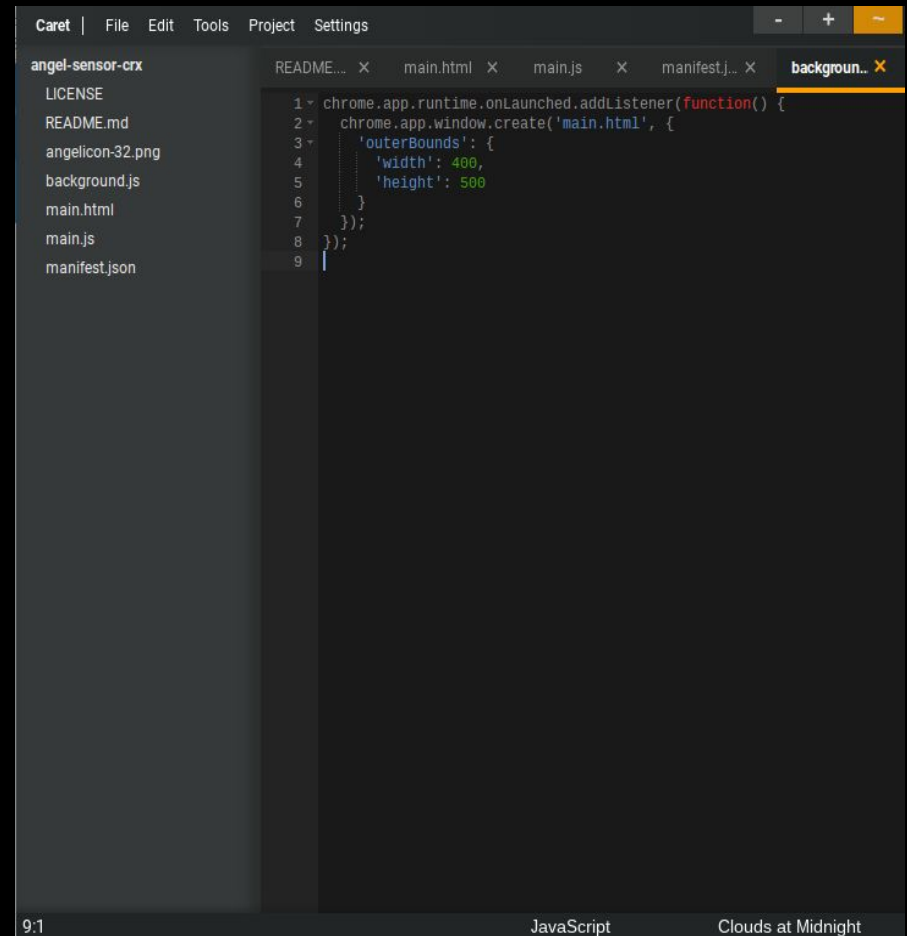
Polarr 3

- ★ Commercial *Offline* Photo Editor
- ★ Full Featured: Filters, Curves, etc...



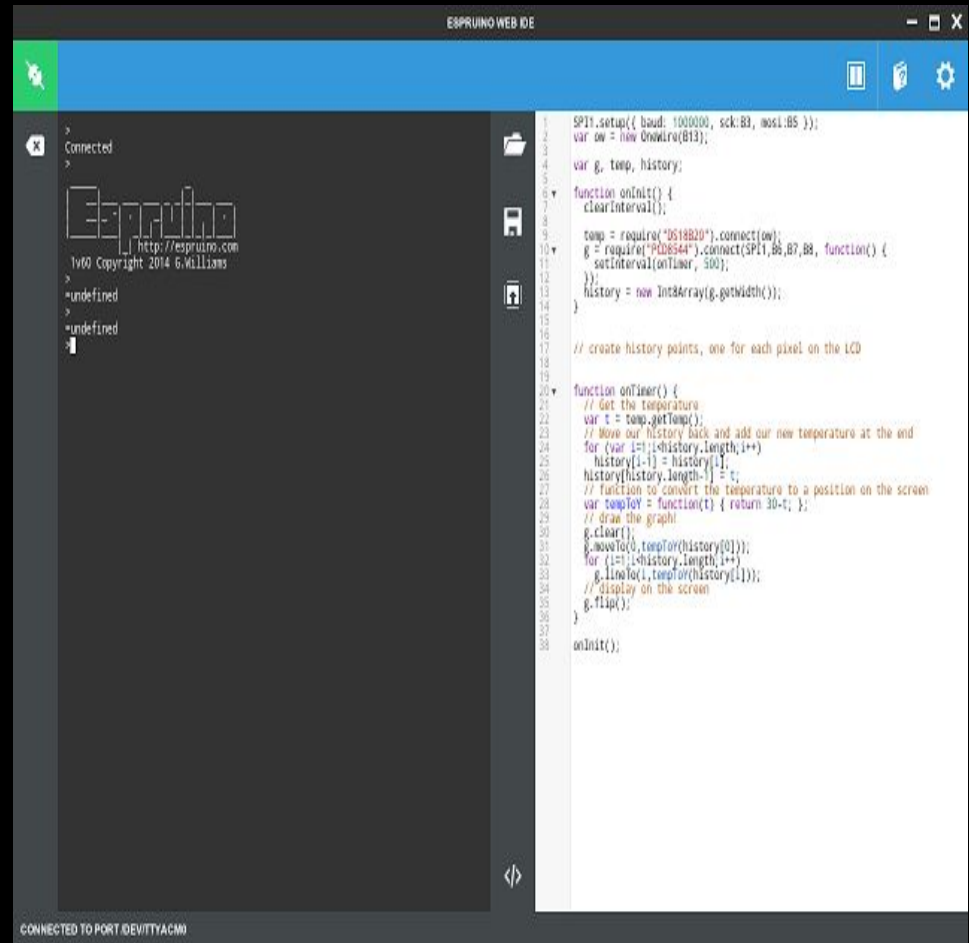


- ★ Open-Source Advanced Text Editor
- ★ Similar to Sublime, Atom, etc.



Espruino

- ★ IDE for Espruino ARM-M3 Microcontrollers
- ★ Espruino Boards themselves have **JS runtime**
- ★ Live coding via JS **REPL over USB!**
- ★ Demo...



The screenshot displays the Espruino Web IDE interface. On the left, a terminal window shows a 'Connected' status and a small bar chart. The main editor area on the right contains JavaScript code for an Espruino microcontroller. The code sets up an SPI interface, initializes a temperature sensor (DS18B20), and uses an onInterval function to read temperature data and update an LCD display. The LCD display shows a bar chart of temperature history.

```
ESPRUINO WEB IDE

> Connected
>
http://espruino.com
lv00 Copyright 2014 G.Williams
>
*undefined
>
*undefined
>

SPI.setup({ baud: 100000, sck: B3, mosi: B5 });
var ow = new OneWire(B13);

var g, temp, history;

function onInit() {
  clearInterval();
  temp = require("DS18B20").connect(ow);
  g = require("PDB8344").connect(SPI, B6, B7, B8, function() {
    setinterval(onInterval, 500);
  });
  history = new Int8Array(g.getWidth());

  // create history points, one for each pixel on the LCD
}

function onInterval() {
  // get the temperature
  var t = temp.getTemp();
  // Move our history back and add our new temperature at the end
  for (var i=1; i<history.length; i++)
    history[i-1] = history[i];
  history[history.length-1] = t;
  // function to convert the temperature to a position on the screen
  var tempPos = function(t) { return 30-t; };
  // draw the graph
  g.clear();
  g.moveTo(0, tempPos(history[0]));
  for (i=1; i<history.length; i++)
    g.lineTo(1, tempPos(history[i]));
  // display on the screen
  g.flip();
}

onInit();
```

CONNECTED TO PORT /DEV/TTYACM0

Git Crx

- ★ Open Source,
Offline, Git Client
- ★ By Moi...

ctrl-o : open local repo, ctrl-r : clone remote, ctrl-h : show help

Date	Time	Author	Commit Message
Sun Mar 02 2014	21:37	Maksim Lis	use updated git-htmb that fixes submodules
Fri Feb 28 2014	18:45	Maksim Lis	fix cm line-highlight, readonly mode, clone progress
Fri Feb 28 2014	18:22	Maksim Lis	help text, cancel func, fix list+cm layout
Fri Feb 28 2014	14:23	Maksim Lis	statusbar working again, misc other fixes
Fri Feb 28 2014	11:31	Maksim Lis	fully working paginated commitlist
Fri Feb 28 2014	10:16	Maksim Lis	ctrl-o launch F8 choose dialog without button
Fri Feb 28 2014	10:16	Maksim Lis	impl up/down in commitlist, switch templater again
Thu Feb 27 2014	16:24	Maksim Lis	wdp on paged table, display working keys todo
Thu Feb 27 2014	15:16	Maksim Lis	fix menu hide/show
Sun Feb 23 2014	21:19	Maksim Lis	very basic working gui for clone and local browse

```
--- a/git-htmb
+++ a/git-htmb
@@ -1,10 +1,10 @@
-Subproject commit 80576284818b8bda773a8b1c83cdaabcb66888ee
+Subproject commit 128f3a833a828a36e8210f79ef177227ef64484b0
[Index: README.md]
-----
+++ README.md
@@ -4,3 +4,8 @@
-
+
+This is very rough at the moment.
+Do "NOT" use this with any repositories you would cry about if they got deleted, corrupted or moved into an alternate universe.
+
+## Install for testing
+* after git clone need at git init the git-htmb submodule
+* load into chrome as "unpacked extension" [sic]
+
+## -29,30 +30,30 @@
+## Usage
+
+I've tried to key the key bindings similar to [Tig](http://jonas.nitro.dk/tig/manual.html).
+
+* j - move up through commit list
+* k - down - move down through commit list
+* J - move up through cancel list
+* K - move down through commit list
+
+HOME - Jump to first commit
+END - Jump to last line
+Enter - open currently selected commit
+q - esc - close the current view
+\\ No newline at end of file
+q - close the current view
+\\ No newline at end of file.
002f70335d890c3000a493c49d1a99981916270c7 - commit 1 of 39
```

Angel Sensor

- ★ **Open** BLE Heart Rate and activity sensor
- ★ I've just started working on App for it...
- ★ Demo...



Others...

- ★ Gliffy (Offline-Able) Diagram Editor
- ★ Enjoy Music Player (Offline music player)
- ★ PostMan (aka GUI Curl)
- ★ Chromeduino (Arduino IDE)
- ★ More...

<https://chrome.google.com/webstore/category/apps>

?_feature=offline&_feature=chromeapp

Anatomy of a Chrome App

- ★ Zip file containing Metadata, HTML, CSS, JS
- ★ Metadata: JSON Manifest with icons, permissions, etc.
- ★ Can be “side-loaded” during development
- ★ Need to be signed for Chrome Webstore
- ★ All similar to Android APKs...

Developing **ON** a Chromebook

- ★ Familiar Chrome Developer Tools...
- ★ Who knew about dev tools **workspaces** ?
- ★ Dev Editor App
(*now deprecated*)



More than one way to skin a cat...



Emscripten

- ★ C/C++ to JS Cross-compiler (LLVM)
- ★ Missing bindings for Chrome App API's
(eg. File, Socket, etc)

PNaCl

- ★ Portable Native Client
- ★ C/C++ Compiler (LLVM)
- ★ Sandboxed exe's
- ★ Threading (**multicore**), **SIMD** library, etc.
- ★ Limited APIs (eg. minimal File IO)

ARC

- ★ App Runtime for Chrome
- ★ Allows Android Apps to be “ported” to Chrome
- ★ Some Play Services supported

Other features...



Supervised Users

- ★ Supervised Users have logins
- ★ Supervised users dont need G accounts
- ★ White/Black list Urls
- ★ Monitor Browsing History
- ★ Prevent Apps/Extensions being installed

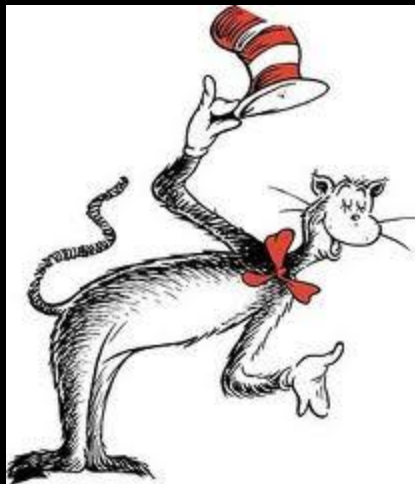
Kiosk Mode & Apps

- ★ Auto-boot into locked down app
- ★ Great for Digital Signage
- ★ “Builder App” available for simple uses

What did we cover?

- ★ Myths about ChromeOS
- ★ What a Chrome App is
- ★ Available App APIs
- ★ Porting options
- ★ Example Apps
- ★ Other features (Supervised, Kiosk)

Thank You!



References

- ★ Google Docs: https://developer.chrome.com/apps/about_apps
- ★ CloudReady: <http://www.neverware.com/freedownload>
- ★ ChromiumOS from ArnoldTheBat: <http://chromium.arnoldthebat.co.uk/>
- ★ Chrome Devtools workspaces: <https://developers.google.com/web/tools/setup/setup-workflow?hl=en>
- ★ Polarr 3: https://www.polarr.co/chrome?platform=polarr&label=homepage_website
- ★ Caret: <http://thomaswilburn.net/caret/>
- ★ Git Crx: <https://github.com/maks/git-crx>
- ★ Enjoy Music Player: <https://chrome.google.com/webstore/detail/enjoy-music-player/hncfgilfeieogcpgjhnnhddghgdjbekl>
- ★ Boxy SVG: <http://boxy-svg.com/>
- ★ Chromeduino: <https://chrome.google.com/webstore/detail/chromeduino/dmkincdpchiadkhhocmbpiljebfifgbl0>
- ★ Zed: <https://chrome.google.com/webstore/detail/zed-code-editor/pfmjnmeippmcebpIngmhfkleiinphhp?hl=en>
- ★ POSTMan: <https://chrome.google.com/webstore/detail/postman/fhbjgbiflinjbdggehcdcdcbncdddomop>

Questions?

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