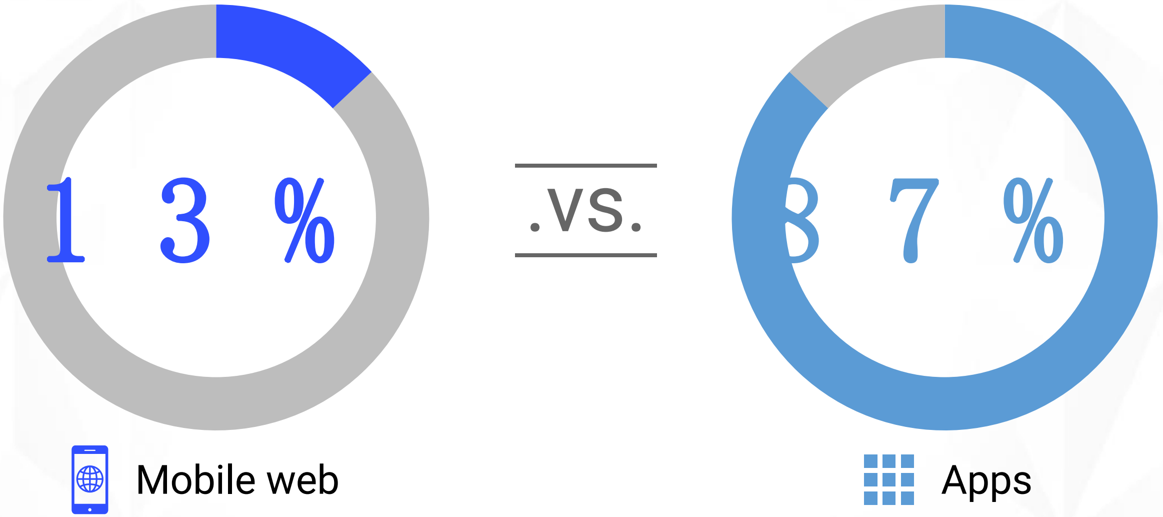
企鹅电竞PWA实践

腾讯增值产品部　渠宏伟

CONTENTS

什么是PWA

Why not Web?



Source: comScore Mobile Metrix, U.S., Age 18+, June 2015

What was missing?

可靠的性能

推送消息

桌面图标访问

离线缓存

硬件权限

What is a Progressive Web App?

Progressive Web App 带来的体验将**Web与APP优点相结合。**用户在浏览器标签中第一次访问时就能体会到它们的好处，因为**不需要安装。**在用户随着时间的推移增进与应用的关系后，其功能会变得越来越强大。它即使在不可靠网络上也能**快速加载**、能够发送相关**推送通知**、具有**桌面图标**，并且可采用顶层**全屏体验**的方式加载。

PWA关键特性

渐进式 - Work for every user

响应式 - Fit any form

离线访问 - Work offline or on low quality

类原生体验 - Feel like an app

更新的 - Always up-to-date

安全 - Served via HTTPS

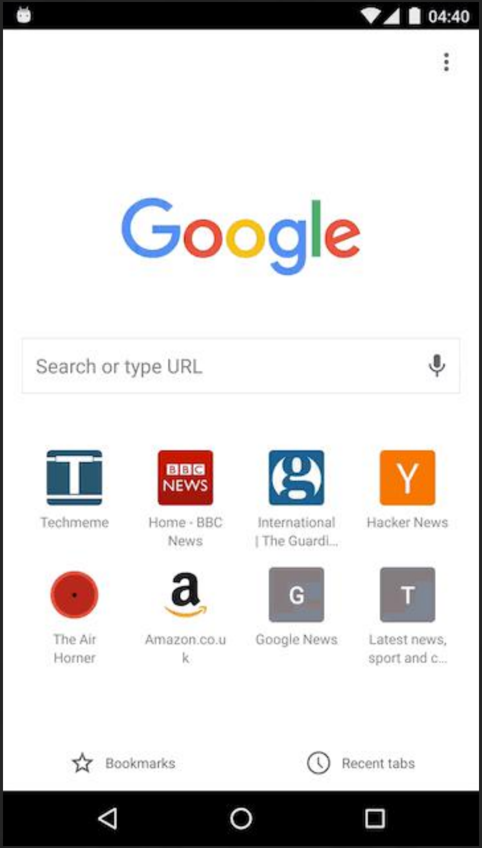
可搜索 - Are identifiable as “applications”

通知用户 - push notifications.

安装到桌面 - Allow users to “keep” apps on their home screen

易分享 - Easily share via URL

PWA DEMO : airhorner



PWA的收益

页面停留时常增加65%
发推量增加75%
跳出率降低20%

The Weather Channel

页面加载耗时减少了80%

MakeMyTrip的PWA的购物用户增加了160%
页面快38%，首次购物者的转换比APP多3倍

Forbes
访问时长增加两倍
访问次数增加20%

https://www.pwastats.com/

PWA核心技术

PWA核心技术

Web App Manifest

Service Worker

App Shell

Push Notification

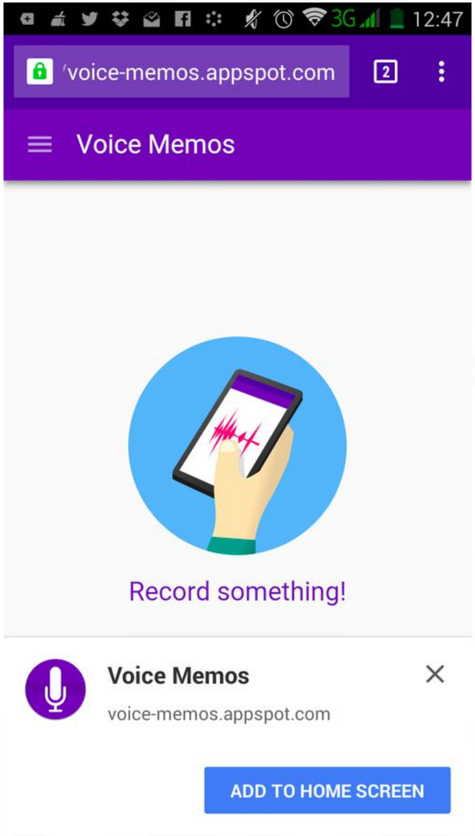
Web App Manifest

/manifest.json

```
{
  "name": ”My WPA Demo",
  "short_name": ”MyWPA",
  "icons": [{
      "src": "/images/curex-256.png",
      "sizes": "256x256",
      "type": "image/png"
  }],
  "start_url": "/index.html",
  "display": "standalone",
  "background_color": "#003300",
  "theme_color": "#003300"
}
```

link in your HTML <head>

```
<link rel="manifest"
href="/manifest.json">
```



Add To Home Screen

拥有一个manifest文件，该文件具有：

一个 short_name（用于主屏幕）

一个 name（用于横幅中）

一个 144x144 png 图标（图标声明必须包含一个 mime 类型的 image/png）

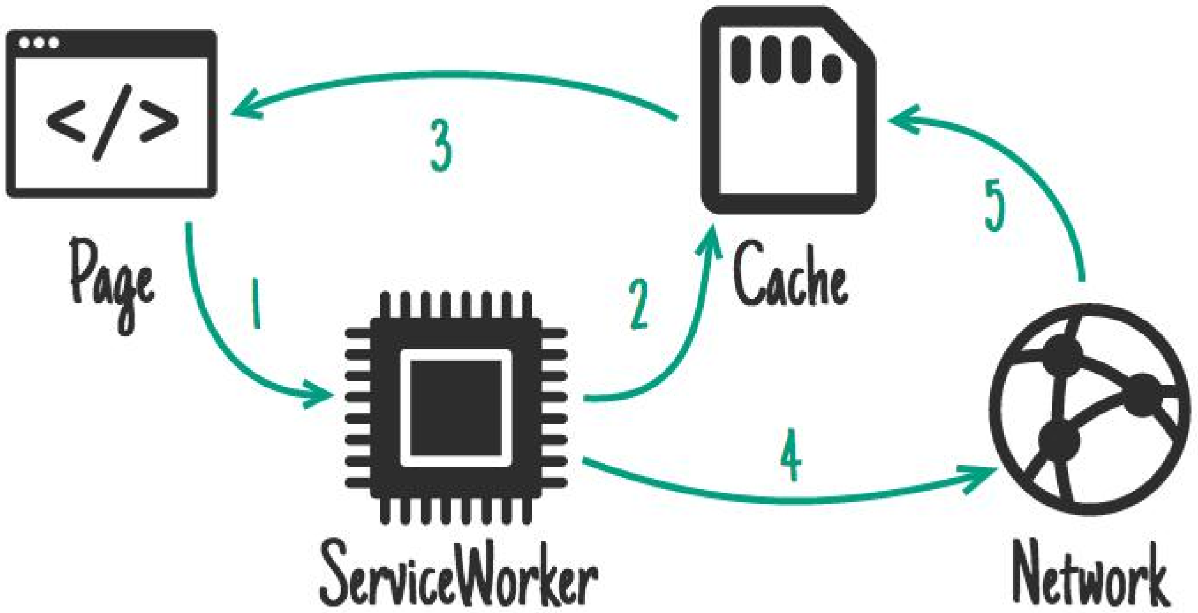
一个加载的 start_url

拥有一个在您的网站上注册的Service Worker。

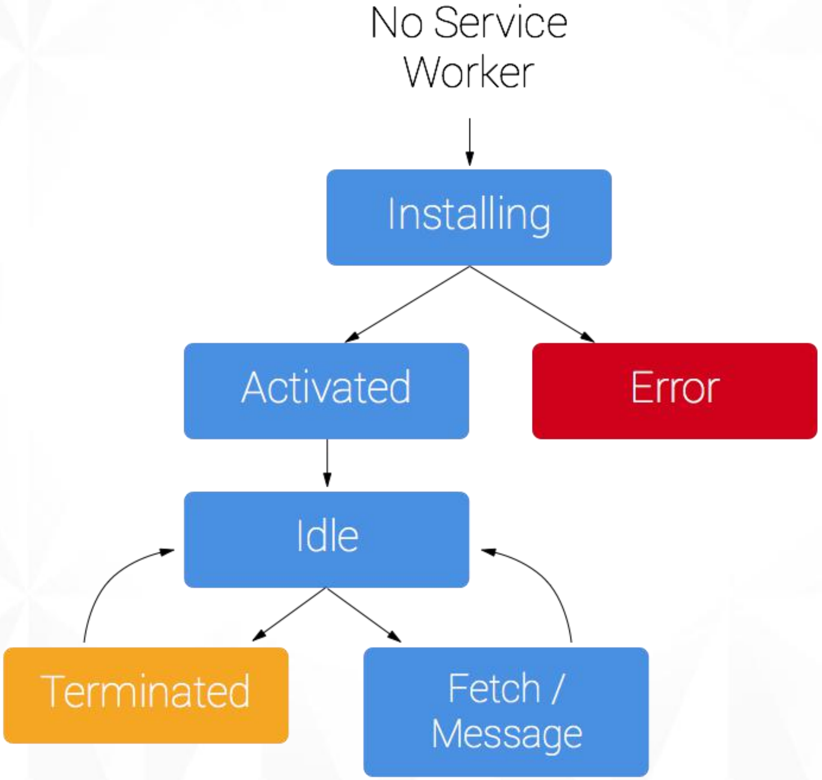
通过 HTTPS 提供（这是使用服务工作线程的一项要求）。

被访问至少两次，这两次访问至少间隔五分钟。

Service Worker



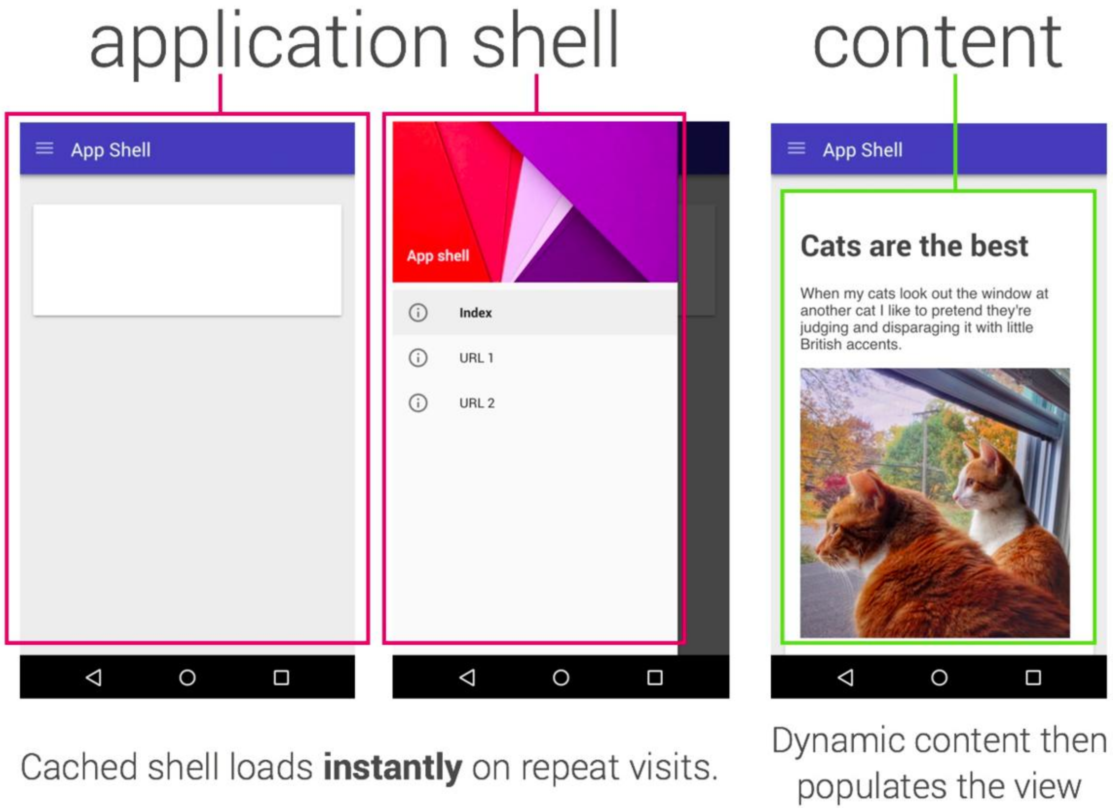
Service Worker Lifecycle



Register Service Workers

```
// Registering service worker in js file
if ('serviceWorker' in navigator) {
  window.addEventListener('load', function() {
      navigator.serviceWorker.register('/sw.js').then(
      function(registration) {
          // Registration was successful
          console.log('ServiceWorker registration
         successful with scope: ', registration.scope);
      }).catch(function(err) {
          // registration failed :(
          console.log('ServiceWorker registration failed
                  : ', err);
      });
  });
}
```

App Shell


application shell
content
App Shell
App shell
Index
URL 1
URL 2
App Shell
Cats are the best
When my cats look out the window at another cat I like to pretend they're judging and disparaging it with little British accents.
Cached shell loads **instantly** on repeat visits.
Dynamic content then populates the view

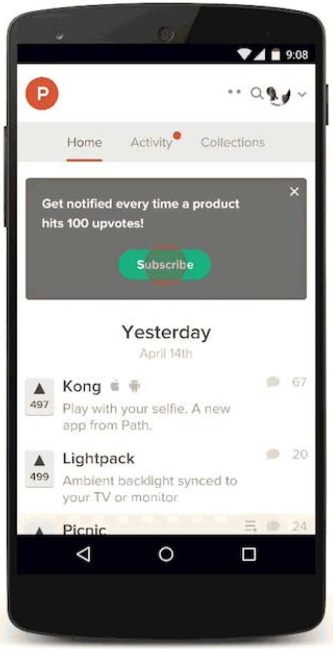
App Shell

```
var CACHE_NAME = 'dependencies-cache';
// Files required to make this app work offline
var REQUIRED_FILES = [
  'logo.png',
  'style.css',
  'index.html',
  '/', // Separate URL than index.html!
  'index.js',
  'app.js'
];
self.addEventListener('install', (event) => {
  // loading each required file into cache
  event.waitUntil(
  caches.open(CACHE_NAME)
  // Add all offline dependencies to the cache
      .then((cache) => {
      return cache.addAll(REQUIRED_FILES));
})
// At this point everything has been cached
.then(() => self.skipWaiting())
);
});
```

Cache Data

```javascript
self.addEventListener('fetch', function(e) {
  console.log('[Service Worker] Fetch', e.request.url);
  var dataUrl = 'https://api.egame.qq.com/';
  if (e.request.url.indexOf(dataUrl) > -1) {
      e.respondWith(
          caches.open(dataCacheName).then(function(cache) {
              return fetch(e.request).then(function(response){
                  cache.put(e.request.url, response.clone());
                  return response;
              });
          })
      );
  } else {
      //Cache, falling back to the network
      e.respondWith(
          caches.match(e.request).then(function(response) {
              return response || fetch(e.request);
          })
      );
  }
});
```

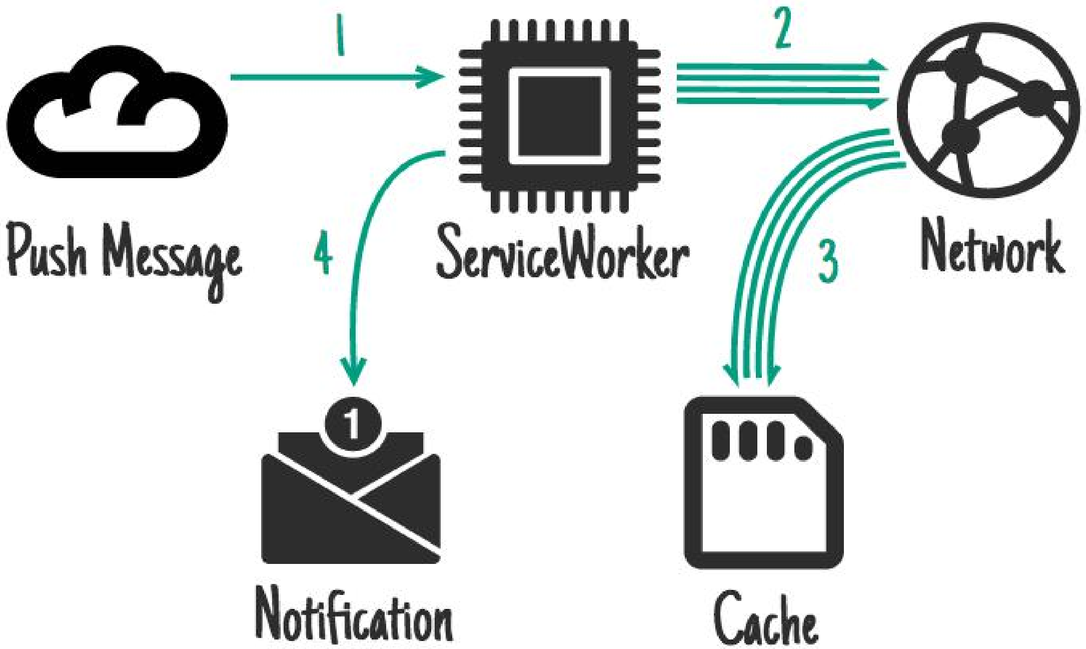
Push Notification


9:08
P
Home
Activity
Collections
Get notified every time a product hits 100 upvotes!
Subscribe
Yesterday
April 14th
Kong
497
Play with your selfie. A new app from Path.
67
Lightpack
499
Ambient backlight synced to your TV or monitor
20
Picnic
24

1. 浏览器关掉也可以运行

2. 需要用户授权

Push Notification



Push Notification

```
// sw.js
self.addEventListener('push', event => {
  event.waitUntil(
  // Process the event and display a notification.
  self.registration.showNotification("Hey!")
);
});
self.addEventListener('notificationclick', event => {
  // Do something with the event
  event.notification.close();
});
self.addEventListener('notificationclose', event => {
  // Do something with the event
});
```

Web Push Protocol

```
+--------+             +---------------+         +--------------+
|   UA   |             | Push Service  |         | Application  |
+--------+             +---------------+         |   Server     |
    |                        |                   +--------------+
    |       Subscribe        |                          |
    |----------------------->|                          |
    |        Monitor         |                          |
    |<======================>|                          |
    |                        |                          |
    |           Distribute Push Resource                |
    |-------------------------------------------------->|
    |                        |                          |
    :                        :                          :
    |                        |        Push Message      |
    |      Push Message      |<-------------------------|
    |<-----------------------|                          |
    |                        |                          |

                 Figure 1: Webpush Architecture
```

PWA实践经验

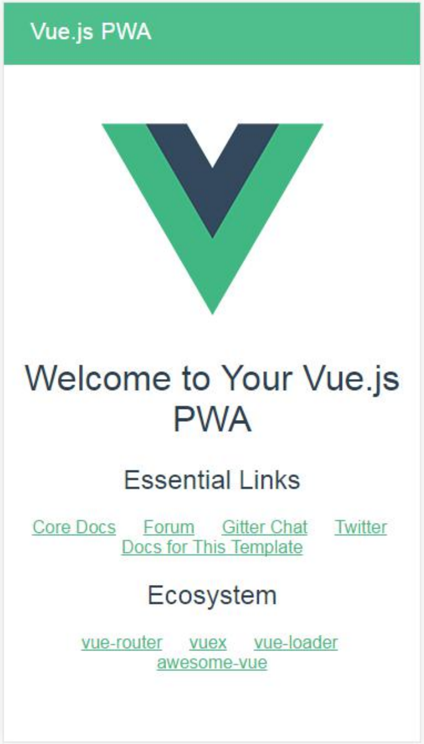
快速创建PWA应用

Vue.js

React

Preact

使用vue-cli创建PWA


Vue.js PWA

Welcome to Your Vue.js PWA

Essential Links

Core Docs Forum Gitter Chat Twitter
Docs for This Template

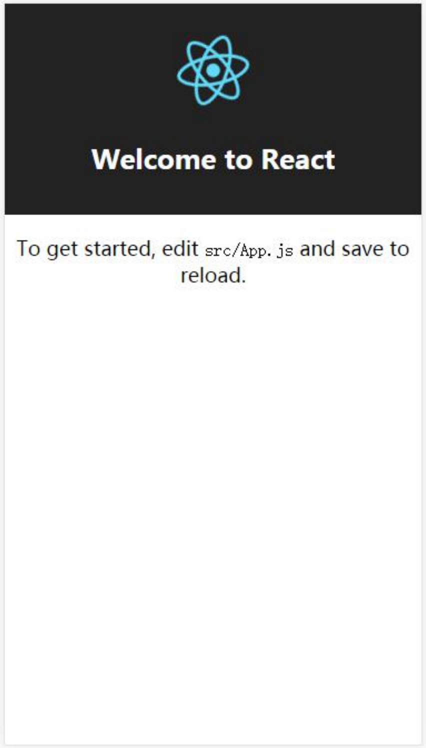
Ecosystem

vue-router vuex vue-loader
awesome-vue

```
# once and you're good:
$ npm install -g vue-cli

# create a new project:
$ vue init pwa my-project
$ cd my-project
$ npm install

# start a dev server:
$ npm run dev
```

https://github.com/vuejs-templates/pwa

使用create-react-app创建PWA

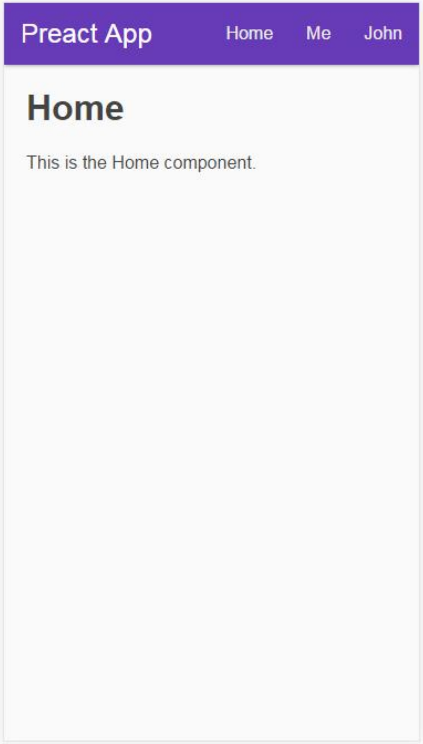

Welcome to React

To get started, edit src/App.js and save to reload.

```
# once and you're good:
npm install -g create-react-app

# create a new project:
create-react-app my-app
cd my-app/

# start a dev server:
npm start
```

https://github.com/facebookincubator/create-react-app

使用preact-cli创建PWA


Preact App

Home Me John

Home

This is the Home component.

```
# once and you're good:
npm i -g preact-cli

# create a new project:
preact create my-great-app
cd my-great-app

# start a live-reload/HMR dev server:
npm start

# go to production:
npm run build
```

https://github.com/developit/preact-cli

经验Tips

统计添加到桌面用户数

```
window.addEventListener('beforeinstallprompt', function(e) {
  // beforeinstallprompt Event fired
  // e.userChoice will return a Promise.
  e.userChoice.then(function(choiceResult) {
      console.log(choiceResult.outcome);
      if(choiceResult.outcome == 'dismissed') {
          console.log('User cancelled home screen install');
      }
      else {
          console.log('User added to home screen');
      }
  });
});
```

不显示添加到桌面提示条

```
window.addEventListener('beforeinstallprompt', function(e) {
  console.log('beforeinstallprompt Event fired');
  e.preventDefault();
  return false;
});
```

延迟提示桌面提示条

```
  console.log('beforeinstallprompt Event fired');
  e.preventDefault();
  // Stash the event so it can be triggered later.
  deferredPrompt = e;
  return false;
});

btnSave.addEventListener('click', function() {
  if(deferredPrompt !== undefined) {
      // let's show the prompt.
      deferredPrompt.prompt();
      // Follow what the user has done with the prompt.
      deferredPrompt.userChoice.then(function(choiceResult) {
          console.log(choiceResult.outcome);
          if(choiceResult.outcome == 'dismissed') {
              console.log('User cancelled home screen install');
          }else {
              console.log('User added to home screen');
          }
          // We no longer need the prompt.  Clear it up.
          deferredPrompt = null;
      });
  }
});
```

忽略参数缓存

```
self.addEventListener('fetch', function(event) {
  event.respondWith(
    caches.match(event.request, {
      ignoreSearch: true
    }).then(function(response) {
      return response || fetch(event.request);
    })
  );
});
```

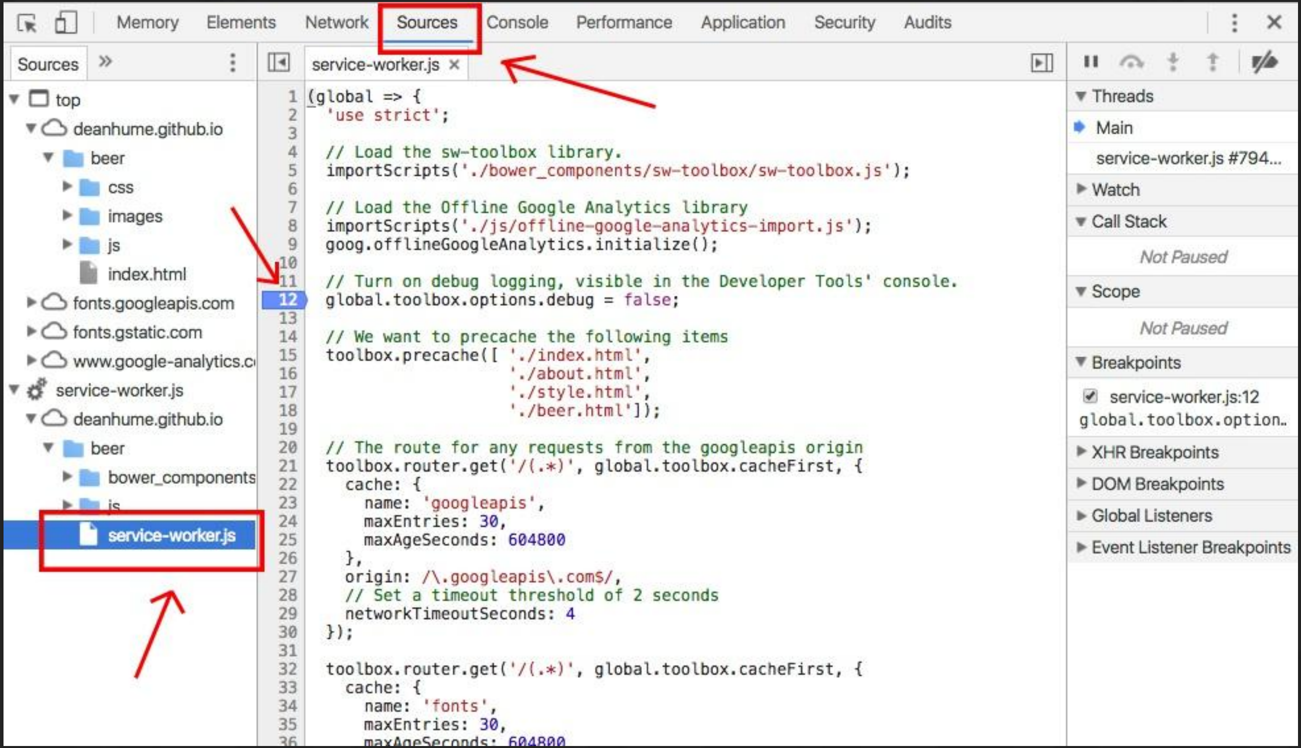
查询缓存容量信息

```
navigator.storageQuota.queryInfo("temporary").then(function
(info) {

  console.log(info.quota);

  // Result: <quota in bytes>

  console.log(info.usage);

  // Result: <used data in bytes>

});
```

缓存持久化

```
if (navigator.storage && navigator.storage.persist) {
  navigator.storage.persist().then(function (persistent) {
      if (persistent)
          console.log("Storage will not be cleared except
                      by explicit user action");
      else
          console.log("Storage may be cleared by the UA
                      under storage pressure.");
  });
}
```

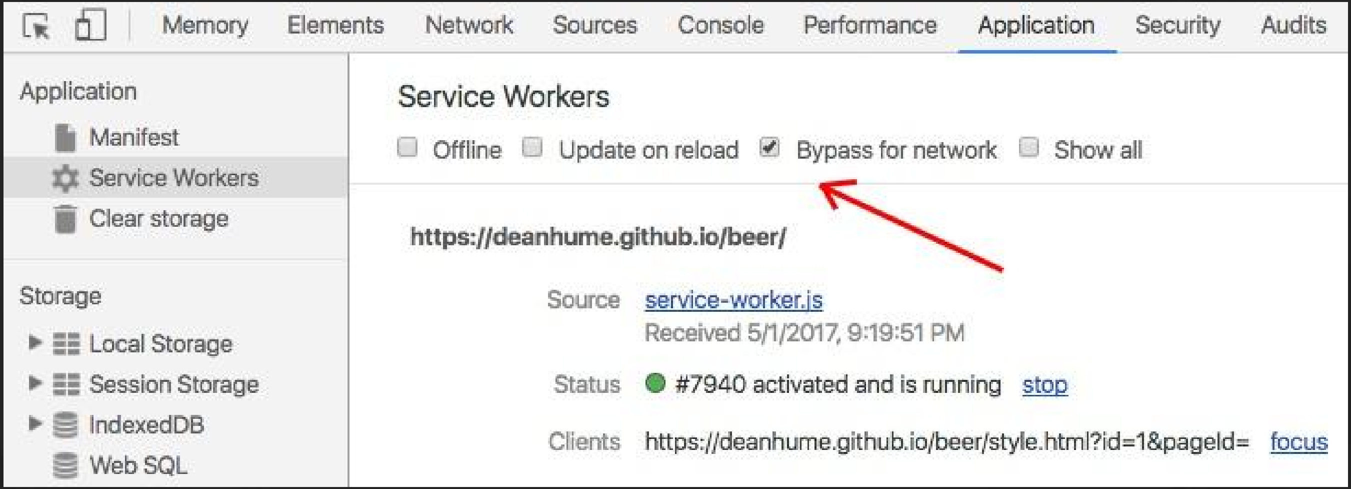
Service Worker代码调试



service-worker.js ×

```
(global => {
  'use strict';

  // Load the sw-toolbox library.
  importScripts('./bower_components/sw-toolbox/sw-toolbox.js');

  // Load the Offline Google Analytics library
  importScripts('./js/offline-google-analytics-import.js');
  goog.offlineGoogleAnalytics.initialize();

  // Turn on debug logging, visible in the Developer Tools' console.
  global.toolbox.options.debug = false;

  // We want to precache the following items
  toolbox.precache([ './index.html',
                     './about.html',
                     './style.html',
                     './beer.html']);

  // The route for any requests from the googleapis origin
  toolbox.router.get('/(.*)', global.toolbox.cacheFirst, {
    cache: {
      name: 'googleapis',
      maxEntries: 30,
      maxAgeSeconds: 604800
    },
    origin: /\.googleapis\.com$/,
    // Set a timeout threshold of 2 seconds
    networkTimeoutSeconds: 4
  });

  toolbox.router.get('/(.*)', global.toolbox.cacheFirst, {
    cache: {
      name: 'fonts',
      maxEntries: 30,
      maxAgeSeconds: 604800
```

Service Worker无缓存调试



Service Workers

[ ] Offline [ ] Update on reload [✓ Bypass for network] [ ] Show all

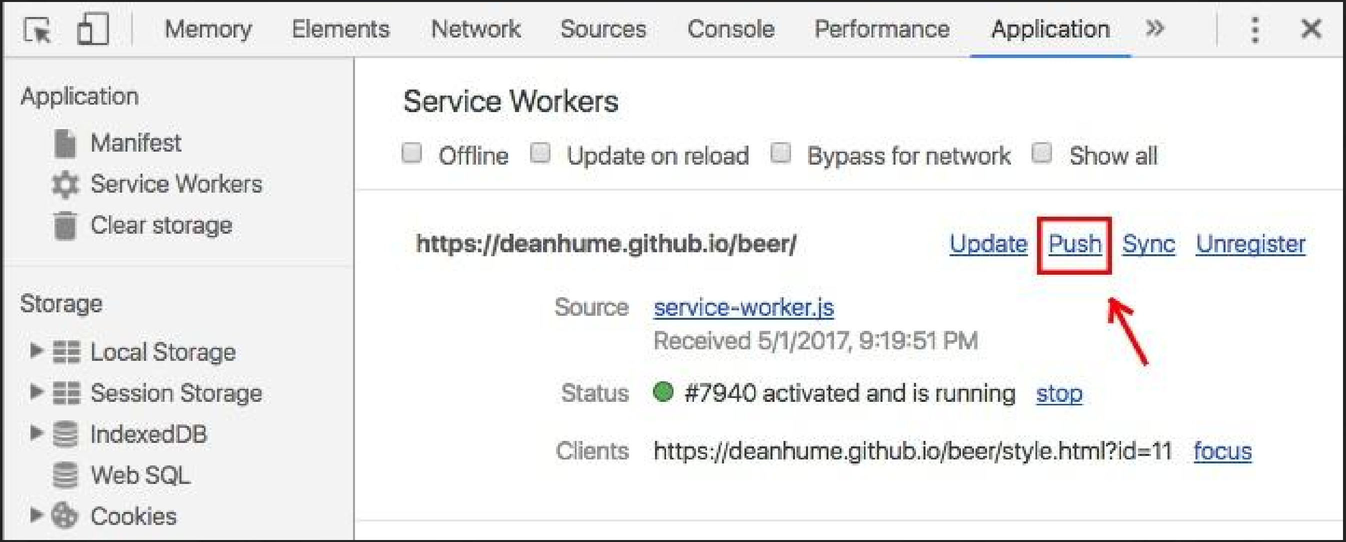
https://deanhume.github.io/beer/

Source service-worker.js
Received 5/1/2017, 9:19:51 PM

Status ● #7940 activated and is running stop

Clients https://deanhume.github.io/beer/style.html?id=1&pageId= focus

Web PUSH调试



Service Workers

☐ Offline ☐ Update on reload ☐ Bypass for network ☐ Show all

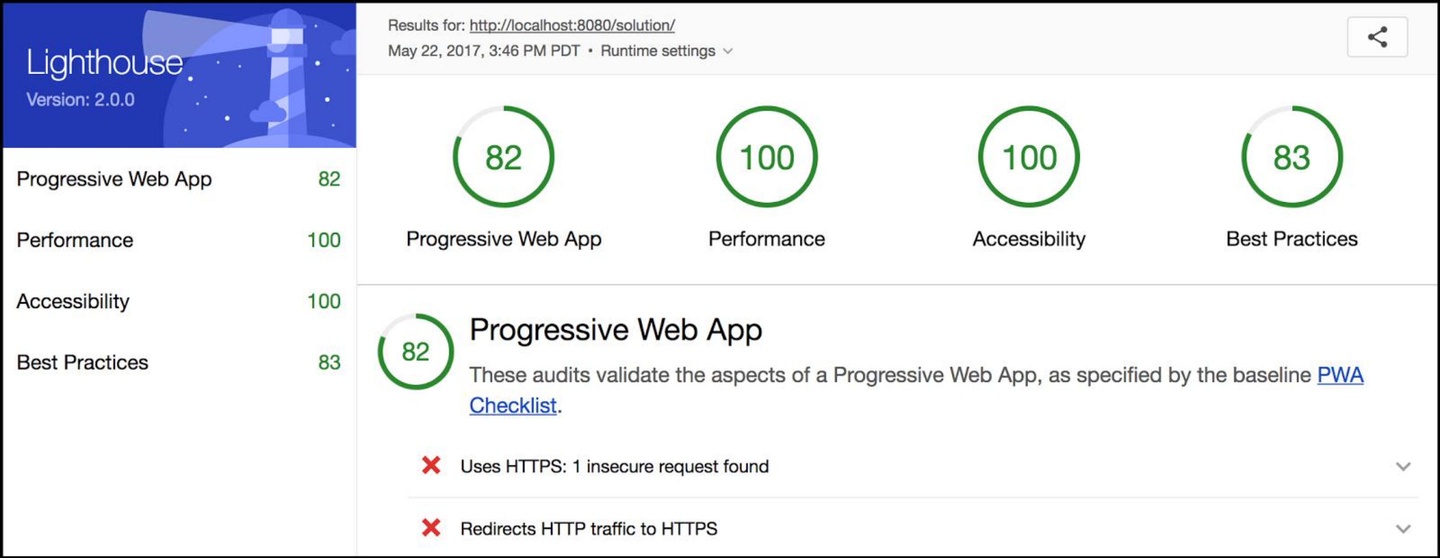
https://deanhume.github.io/beer/ Update Push Sync Unregister

Source service-worker.js
Received 5/1/2017, 9:19:51 PM

Status ● #7940 activated and is running stop

Clients https://deanhume.github.io/beer/style.html?id=11 focus

使用Lighthouse分析PWA



Results for: http://localhost:8080/solution/
May 22, 2017, 3:46 PM PDT • Runtime settings

Progressive Web App	82
Performance	100
Accessibility	100
Best Practices	83

Progressive Web App

82

These audits validate the aspects of a Progressive Web App, as specified by the baseline PWA Checklist.

- ✗ Uses HTTPS: 1 insecure request found
- ✗ Redirects HTTP traffic to HTTPS

https://github.com/GoogleChrome/lighthouse

PWA 限制

1、依赖https，建议开启http2/spdy 降低https带来的延时。

2、目前适用于android 5 以上版本，IOS不支持。

3、android webview环境复杂。X5内核支持Service Worker 。

4、国内GCM不可用，还没有实现Web Push Protocol的推送服务。

PWA的未来

深度整合到Android

Google 博客上宣布，PWA 将会深入集成到 Android 系统中，在即将到来的 Chrome 测试版中，PWA 不仅能出现在屏幕主页，也能出现在**应用列表**以及**系统设置**中，并且可以接收来自其他应用**传入的 intent**。长按其通知还会显示标准 **Android 通知管理控件**而非适用于 Chrome 的通知管理控件。

丰富的API

- Web Bluetooth
- Web USB
- Web Share
- Share Target
- Image Capture
- Media Session
- getInstalledRelationedApps
- Background Fetch
- Generic Sensors API
- Budget API
- Wake Lock
- Improved Quota
- Foreign Fetch
- Shape Detection
- Face Detection
- etc

接口查询：https://whatwebcando.today

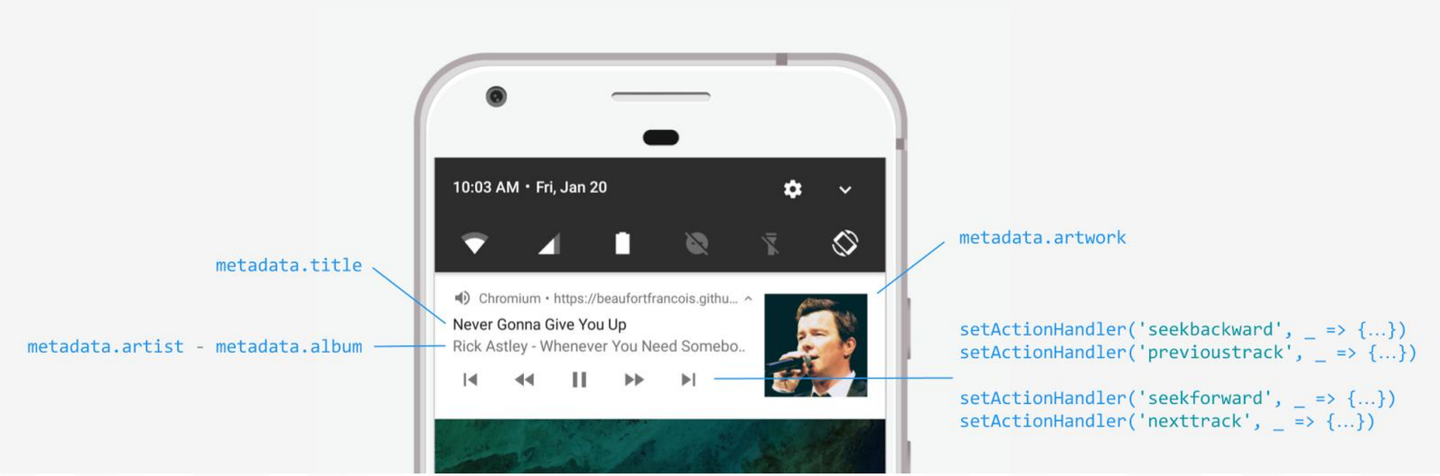
Web Share API

```
navigator.share({
  title: document.title,
  text: "This is a share",
  url: window.location.href
}).then(() => console.log('Successful share'))
.catch(error => console.log('Error sharing:', error));
```

Media Session API

Photo by Michael Alø-Nielsen / CC BY 2.0

```
navigator.mediaSession.|
```


metadata.title
metadata.artist - metadata.album
metadata.artwork
10:03 AM • Fri, Jan 20
Chromium • https://beaufortfrancois.githu...
Never Gonna Give You Up
Rick Astley - Whenever You Need Somebo..

```
setActionHandler('seekbackward', _ => {…})
setActionHandler('previoustrack', _ => {…})
setActionHandler('seekforward', _ => {…})
setActionHandler('nexttrack', _ => {…})
```

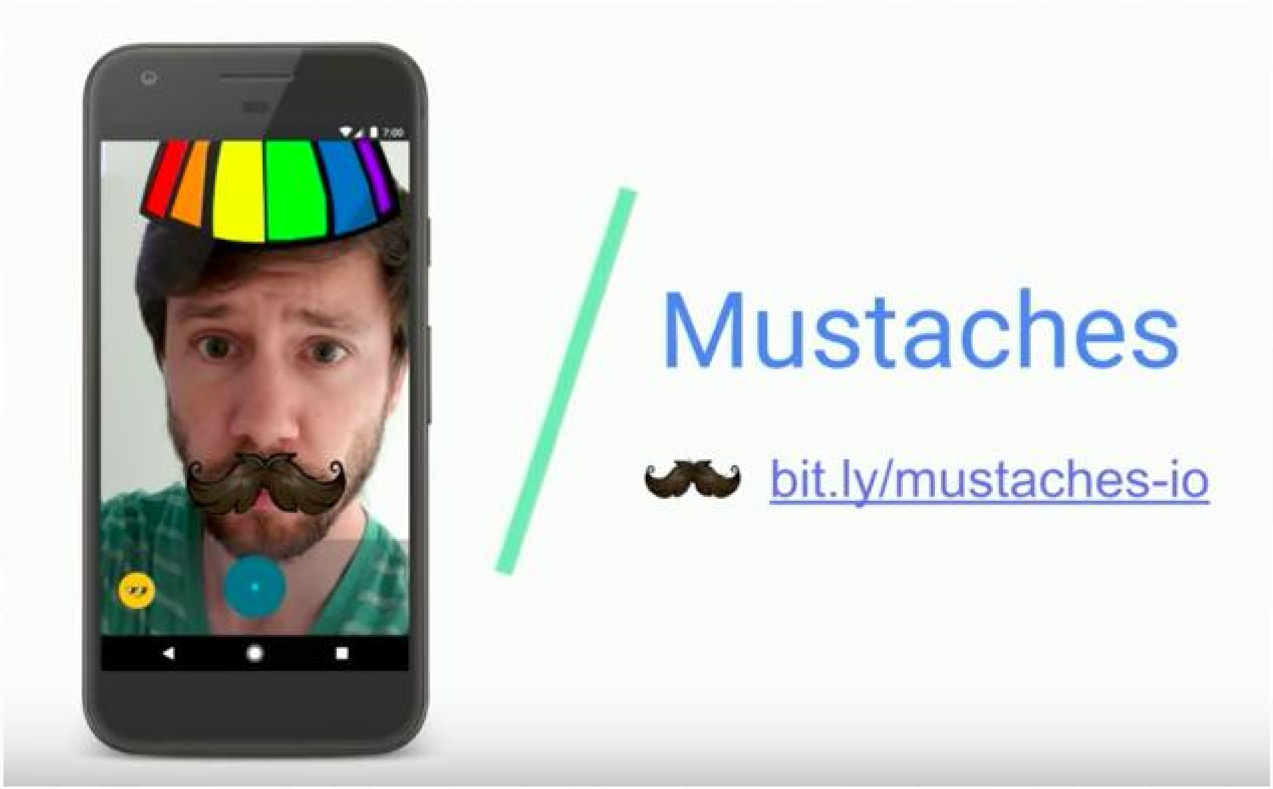
屏幕旋转全屏播放

```
if('orientation' in screen){
  screen.orientation.addEventListener('change',function () {
      if(screen.orientation.type.startsWith('landscape')){
          requestFullscreenVideo();
      }else if(document.fullscreenElement){
          document.exitFullscreen()
      }
  })
}
```

AV1 VS H.265 超高清视频编码

Alliance for Open Media：“我们（IT界的领导者们）要致力于打造一个符合公共利益的下一代媒体编码算法、封装格式以及技术体系”。其核心关键词：Open（开放）、Fast（快）、Royalty-free（免费）、ULTRA High Definition（超高清）。

Shape Detection & Face Detection



Mustaches

bit.ly/mustaches-io

Q & A