

HolyJS



Алексей
Богачук

Offline Second

Some statistics

Legendary Car



Minsk

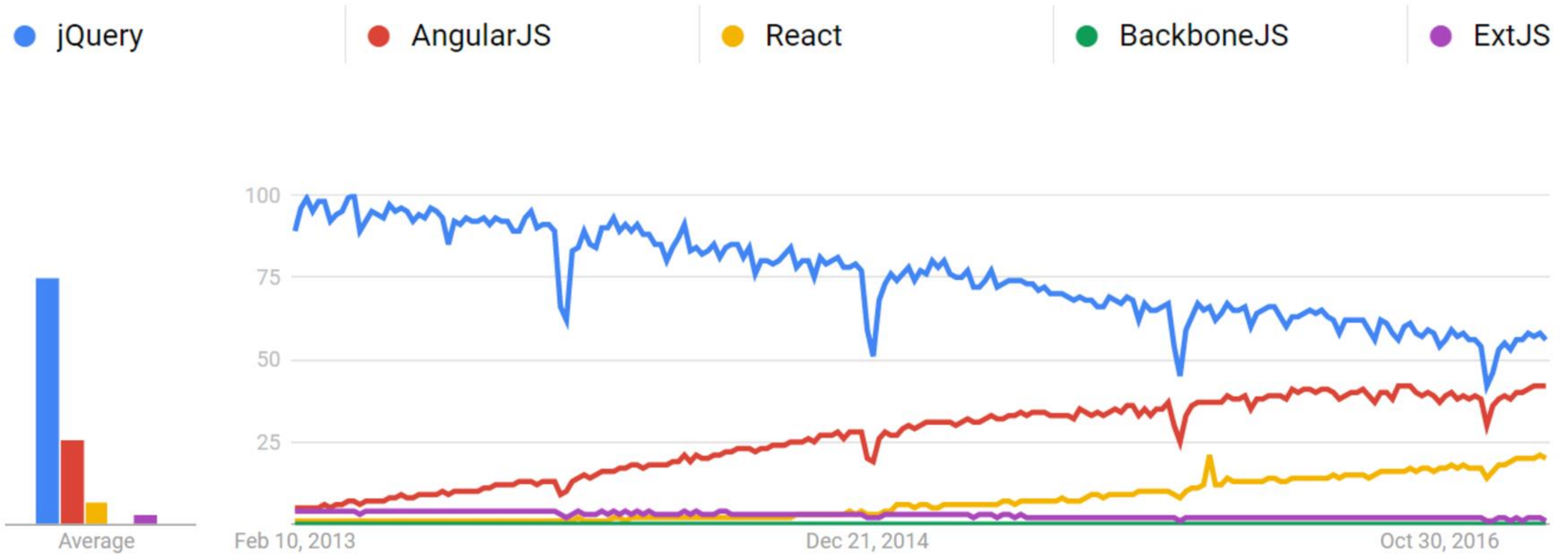


Some more statistics

Legendary Library



Trends



<https://trends.google.com/trends/explore?date=2013-02-09%202017-03-09&q=%2Fm%2FO268gyp,%2Fm%2FOj45p7w,%2Fm%2FO12l1vxv,BackboneJS,ExtJS>

Trends



Uruguay

<https://trends.google.com/trends/explore?date=2013-02-09%202017-03-09&q=%2Fm%2FO268gyp,%2Fm%2FOj45p7w,%2Fm%2FO12l1vxv,BackboneJS,ExtJS>

EPAM CC



TUT.BY

Customer & Offline Second

Insurance Domain



Customer's Clients

Belarus



USA



Reality



Offline

Concerns

- Avoid application crashes or errors
- Allow users to keep working, seamlessly
- Avoid multiple changes
- Time Limit

Step 0: Rules

Rules

- Focus on your goals
- Do not refresh libraries
- Do not touch lint or style guides
- Do not touch working code
- Do not refactor anything

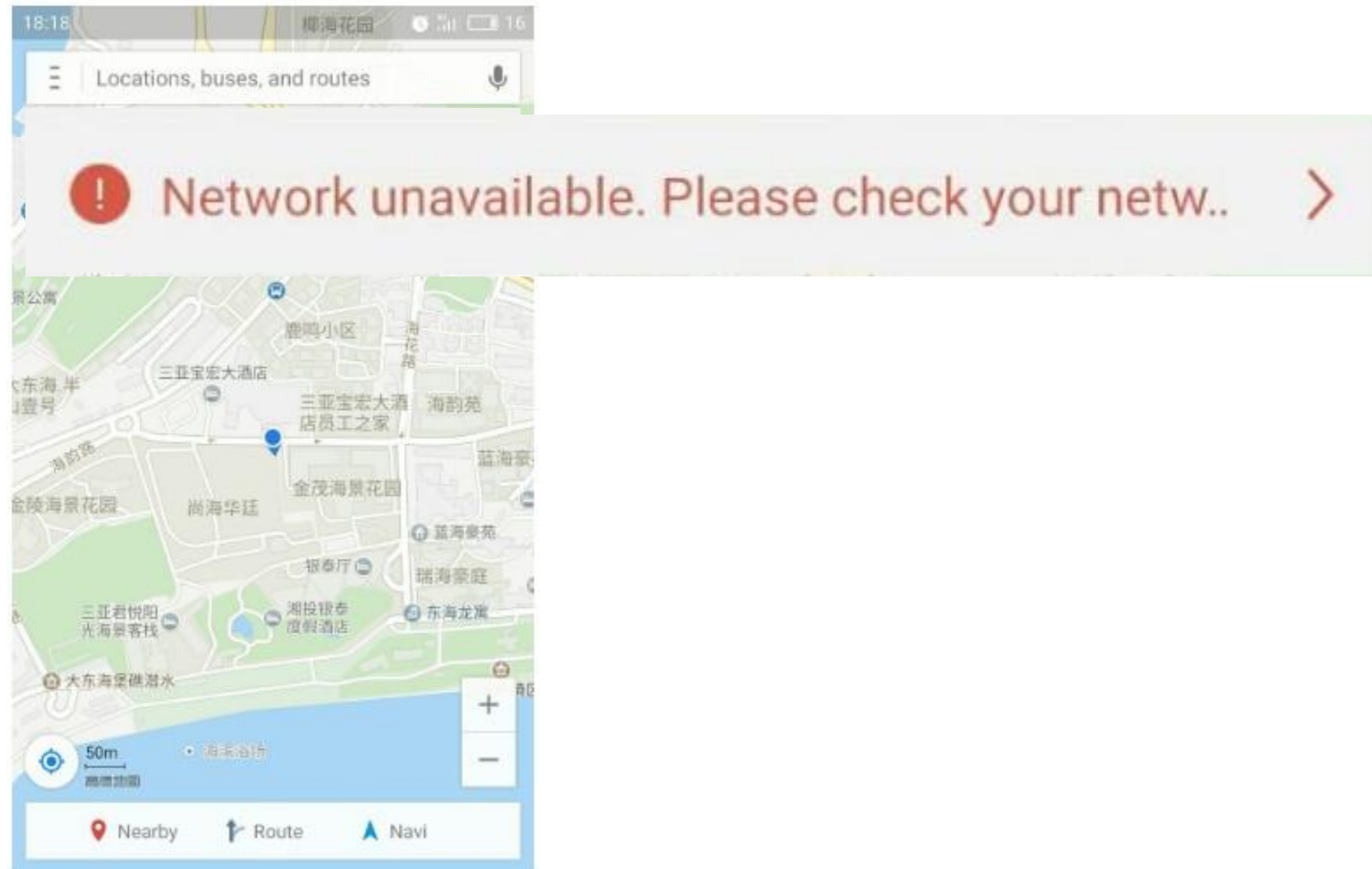
Step 1: Detect Offline

Detect Status

```
function updateOnlineStatus(event) {  
  let condition = navigator.onLine ? 'online' : 'offline';  
  
  console.log(`Do smth. You are ${condition}`);  
}  
  
window.addEventListener('online', updateOnlineStatus);  
window.addEventListener('offline', updateOnlineStatus);
```

<https://jsfiddle.net/cz9u13tr/>

Baidu Map



Gracefully Degrate

OFFLINE

WE WILL BE BACK SHORTLY

THIS SITE IS DOWN FOR MAINTENANCE. PLEASE CHECK BACK AGAIN SOON.

ADMINISTRATOR CAN LOGIN:

User Name Password

Gracefully Degrate



There is no Internet connection

Try:

- Checking the network cables, modem, and router
- Reconnecting to Wi-Fi
- Running Windows Network Diagnostics

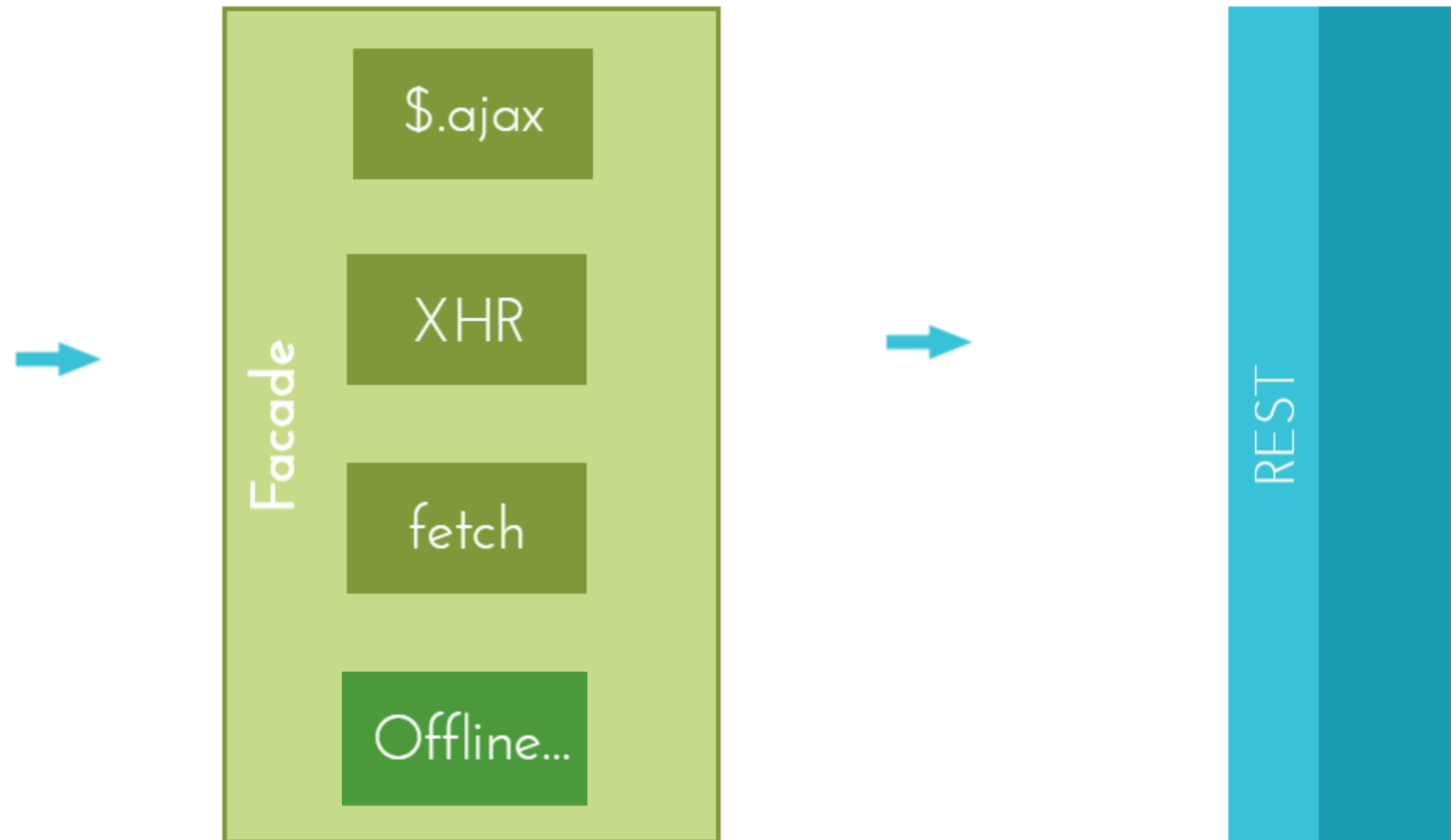
ERR_INTERNET_DISCONNECTED

Step 2: Requests

Requests

- `$http`
- `new XMLHttpRequest()`
- `$.ajax` (`$.get`, `$.post`, ...)
- `fetch`
- `new XMLHttpRequest`
- ...

Request Facade



Step 3: Detect Slow

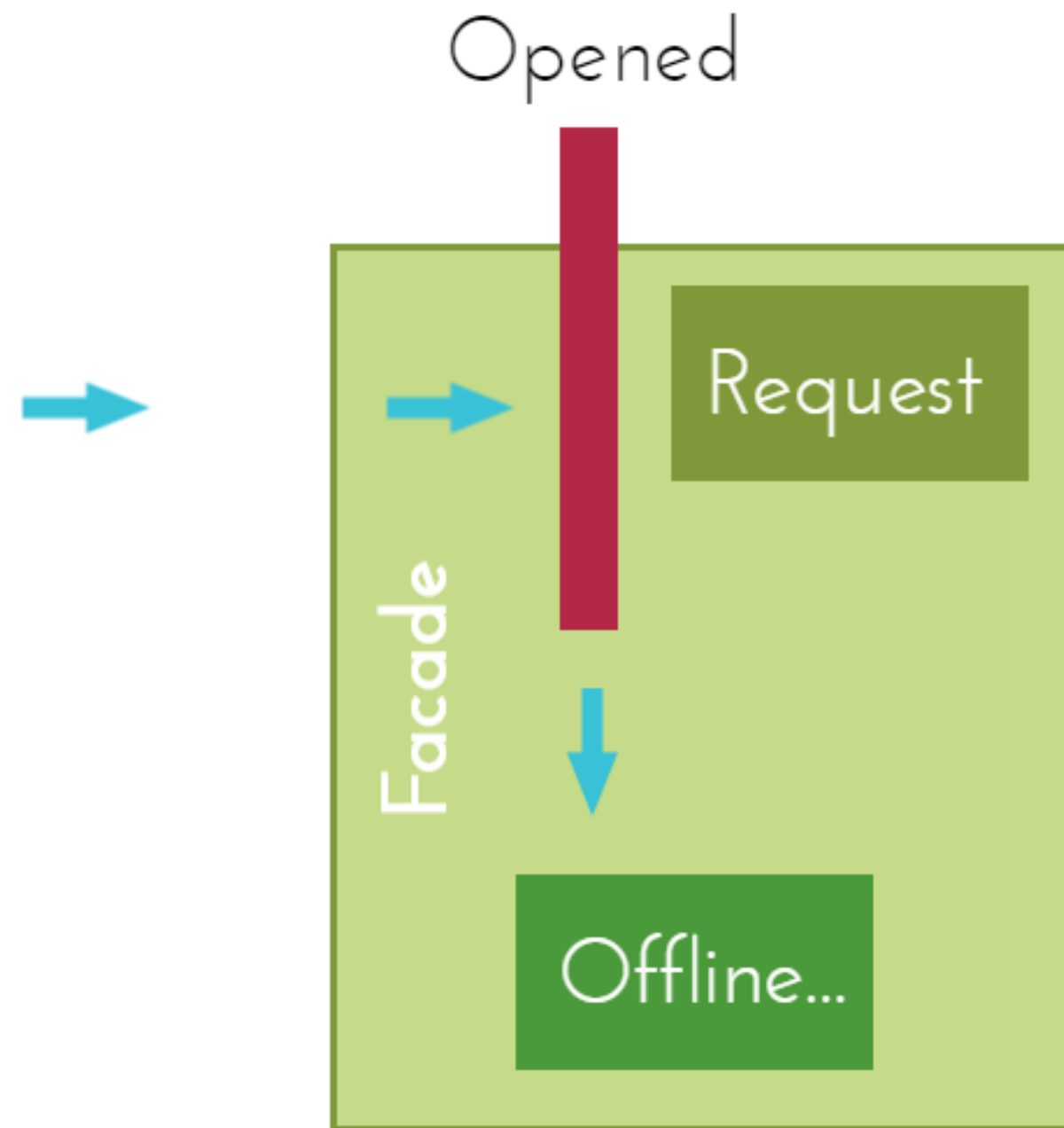
Online or Offline?



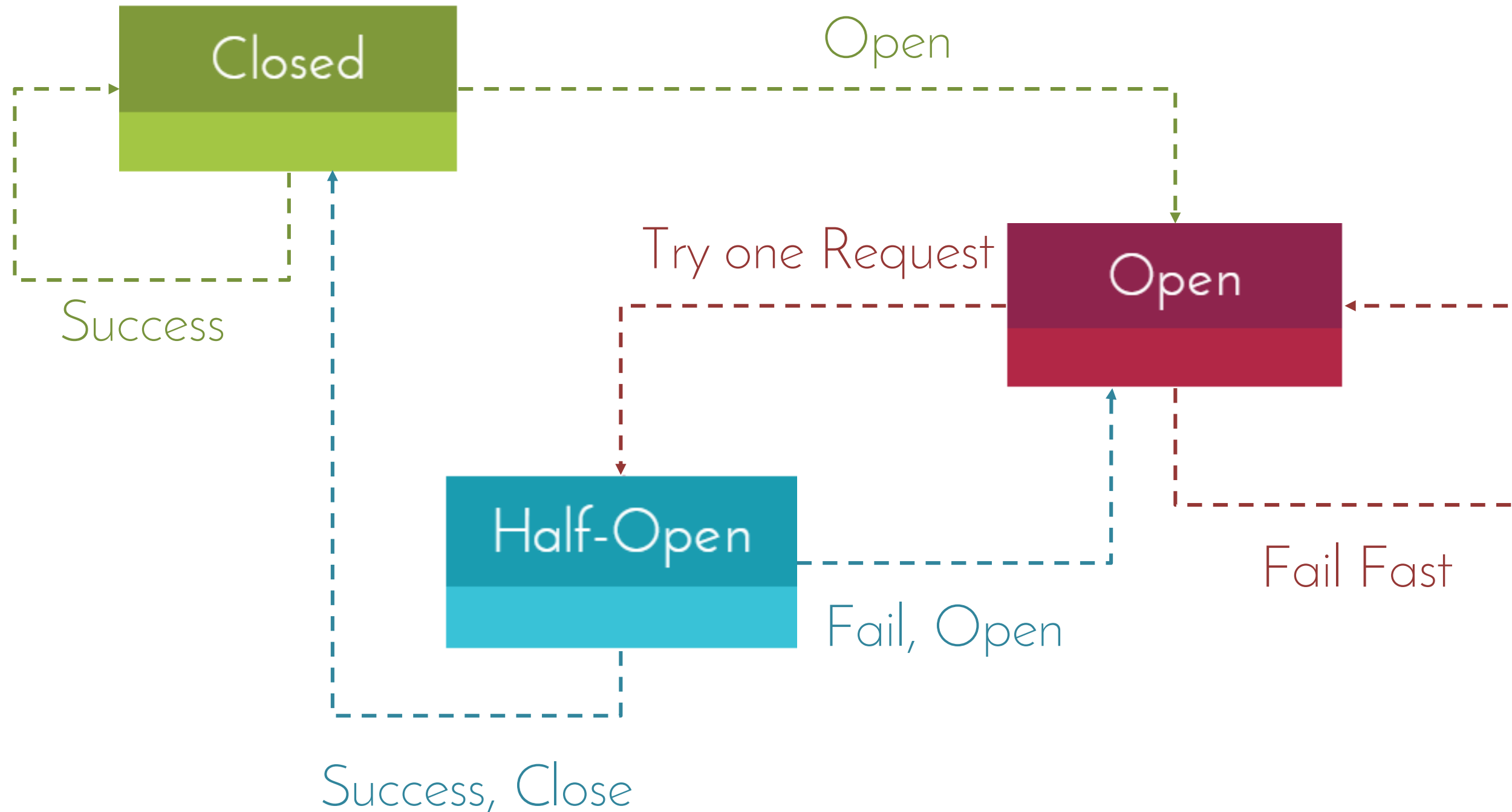
Detect Lie-fi

- Slow or intermittent internet
- Slow or intermittent WiFi
- Avoid HTTP Timeouts

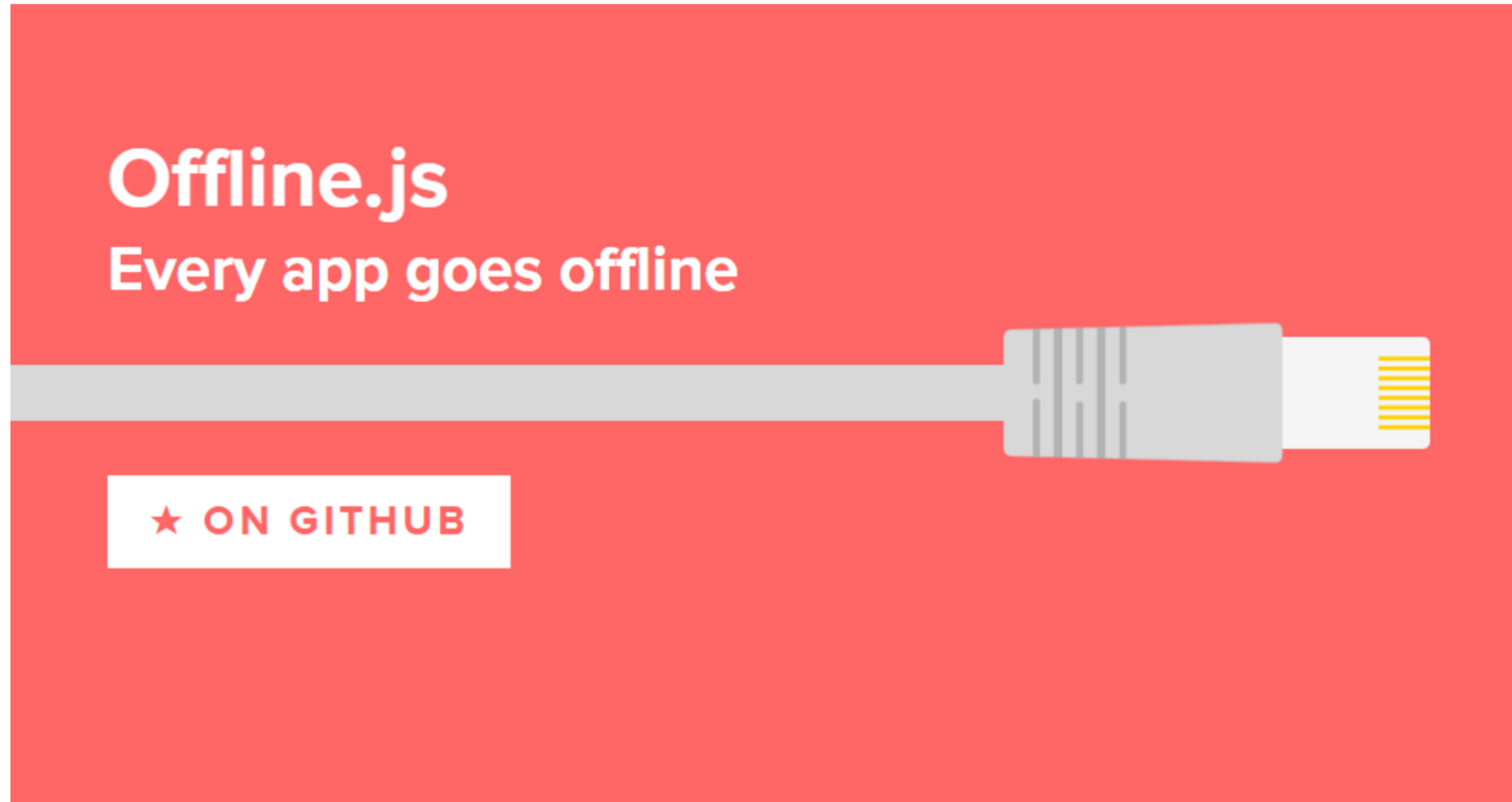
Request Facade + Circuit Breaker



Circuit Breaker Pattern



Offline.js



<https://github.com/HubSpot/offline>

Offline.js

```
{  
  reconnect: {  
    // How many seconds should we wait before rechecking.  
    initialDelay: 3,  
  
    // How long should we wait between retries.  
    delay: (1.5 * last delay, capped at 1 hour)  
  }  
}
```

Offline.js

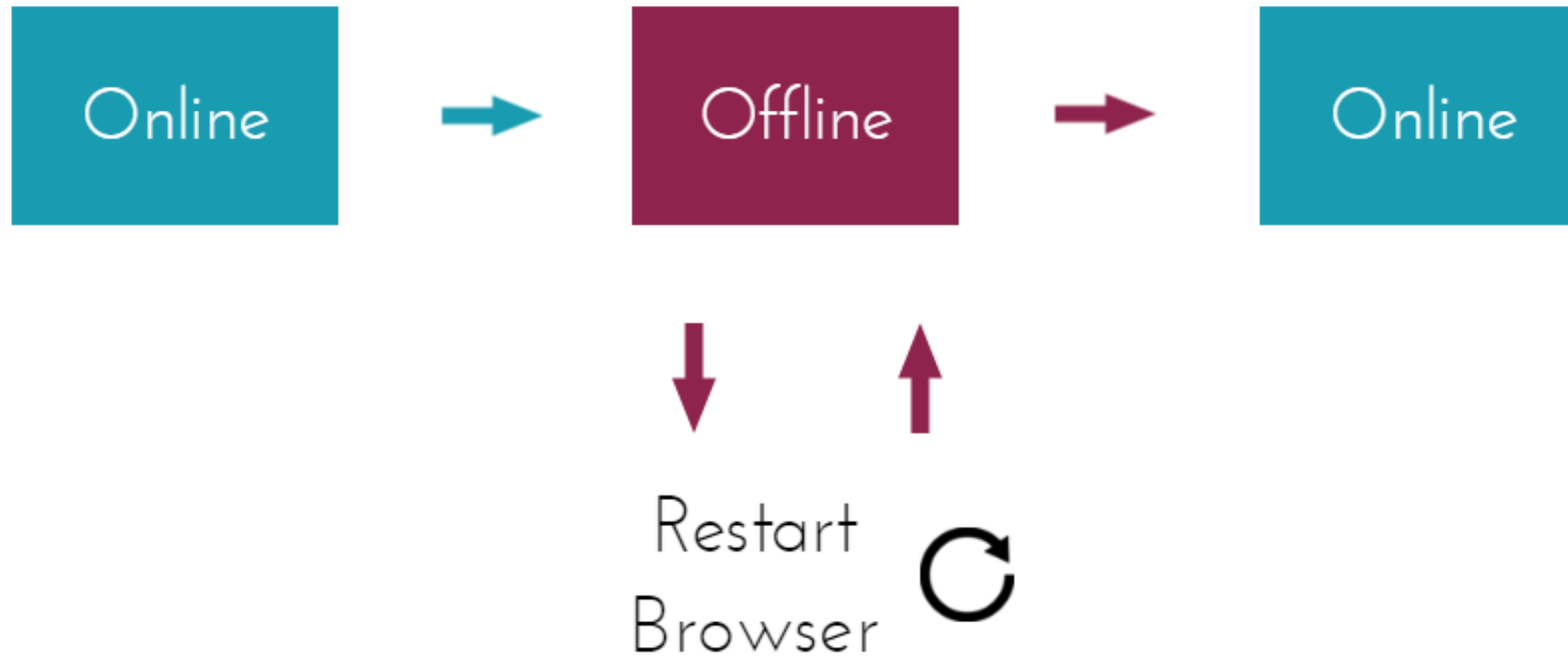
```
// By default, Offline makes an XHR request  
// to load your /favicon.ico  
// You can change the URL it hits  
// (respond with a quick 204 is perfect):
```

```
offline.options = {checks: {xhr: {url: '/connection-test'}}};
```

Intermediate Result

- Offline status
- Requests
- Slow or intermittent Connection

Intermittent Offline



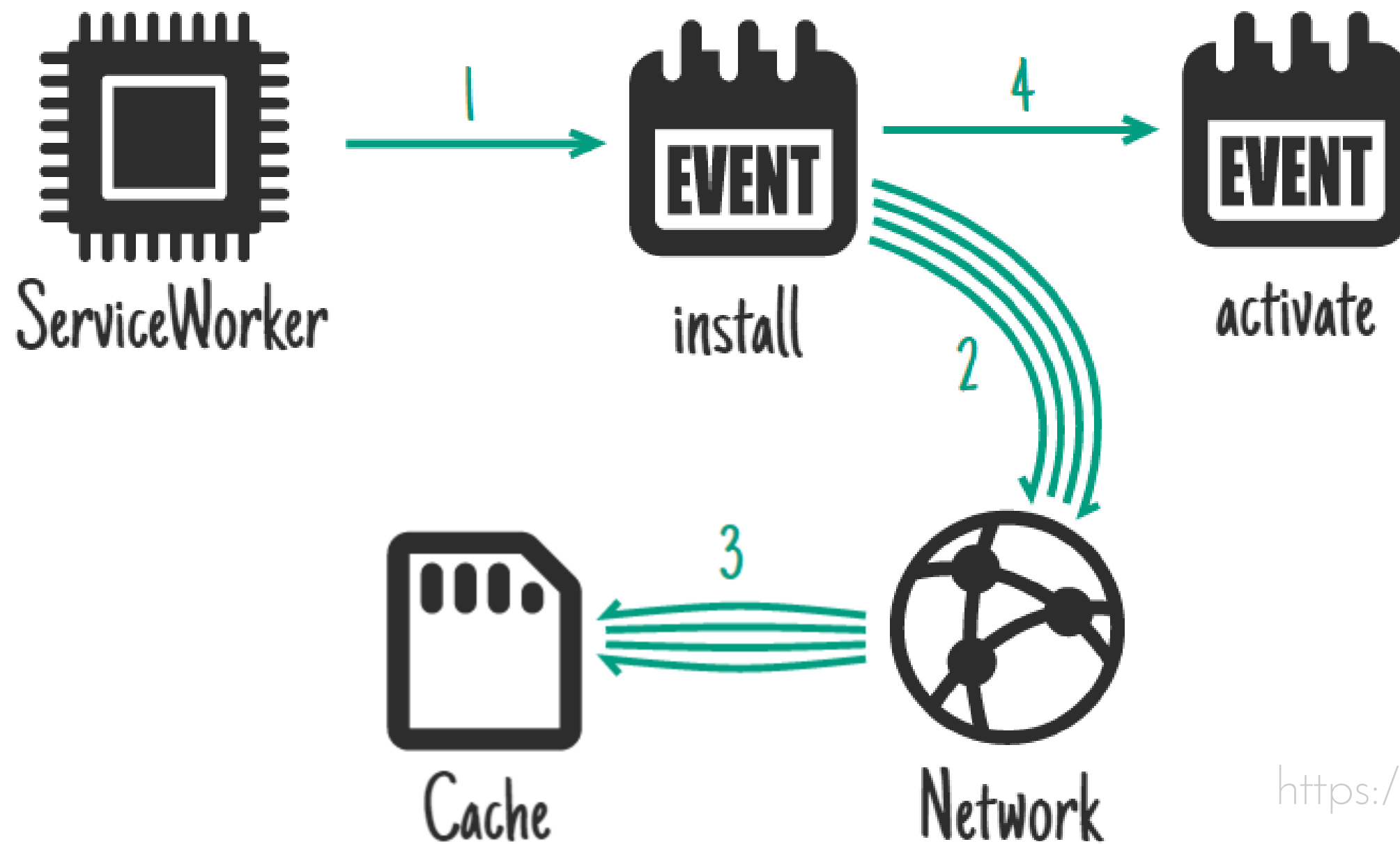
Step 4: Reload Page

Prevent Reload

```
window.onbeforeunload = function(e) {  
    let dialogText = `You are offline! Don't do it!`;   
  
    e.returnValue = dialogText;  
  
    return dialogText;  
};
```

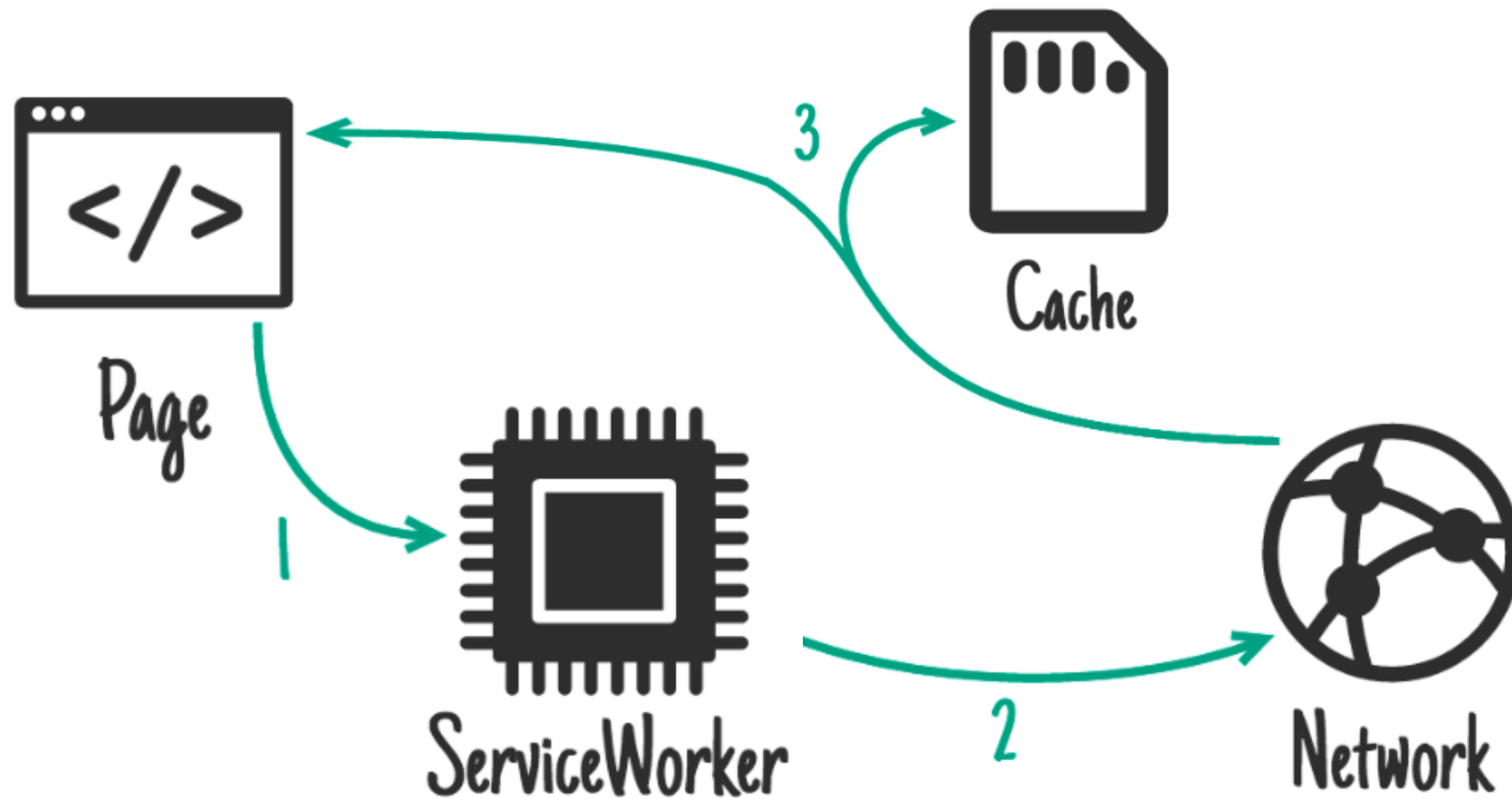
Service Workers

Installation



<https://developers.google.com/web/fundamentals/inline-and-offline/offline-cookbook/>

Cache Response



Cache Storage

- Promisified
- Store Request/Response key/value data
- Persistent between browser restarts



Cache

Work with Service Workers

HTTPS



HTTPS

- ✗ **Mixed Content:** The page at `active-mixed-content.html:1`
'<https://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/active-mixed-content.html>' was loaded over HTTPS, but requested an insecure script '<http://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/simple-example.js>'. This request has been blocked; the content must be served over HTTPS.
- ✗ **Mixed Content:** The page at `active-mixed-content.html:18`
'<https://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/active-mixed-content.html>' was loaded over HTTPS, but requested an insecure stylesheet '<http://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/style.css>'. This request has been blocked; the content must be served over HTTPS.
- ✗ **Mixed Content:** The page at `active-mixed-content.html:68`
'<https://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/active-mixed-content.html>' was loaded over HTTPS, but requested an insecure resource '<http://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content//image-gallery-example.html>'. This request has been blocked; the content must be served over HTTPS.
- ✗ **Mixed Content:** The page at `active-mixed-content.html:82`
'<https://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/active-mixed-content.html>' was loaded over HTTPS, but requested an insecure XMLHttpRequest endpoint '<http://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/xmlhttprequest-data.js>'. This request has been blocked; the content must be served over HTTPS.
- ⚠ **Mixed Content:** The page at `active-mixed-content.html:1`
'<https://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/active-mixed-content.html>' was loaded over HTTPS, but requested an insecure image '<http://googlesamples.github.io/web-fundamentals/samples/discovery-and-distribution/avoid-mixed-content/puppy-thumb.jpg>'. This content should also be served over HTTPS.

HTTPS

```
<script src="http://example.com/jquery.js"></script>
```

```
<link rel="stylesheet" href="http://assets.example.com/style.css"/>
```

```
;
```

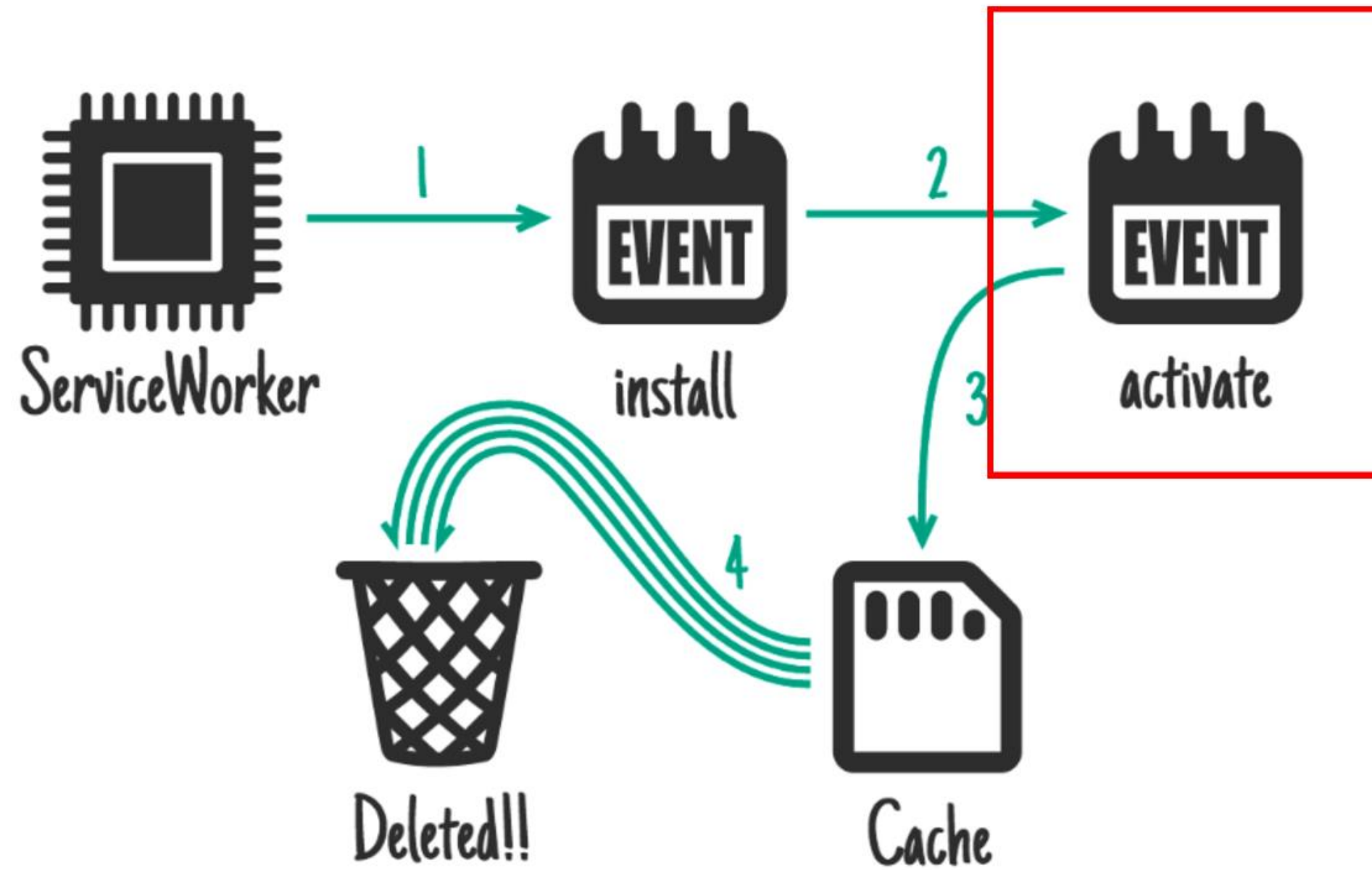
```
<p>Read this nice <a href="http://example.com/2014/12/24/">  
new post on cats!</a></p>
```

HTTPS: fix mixed content

```
<meta http-equiv="Content-Security-Policy"  
  content="upgrade-insecure-requests">
```

```
<meta http-equiv="Content-Security-Policy"  
  content="block-all-mixed-content">
```


Activation



Installation

```
self.addEventListener('install', function(event) {  
  event.waitUntil(  
    caches.open('my-cashe-v1').then(function(cache) {  
      return cache.addAll([  
        '/css/whatever-v3.css',  
        '/css/imgs/sprites-v6.png',  
        '/css/fonts/whatever-v8.woff',  
        '/js/all-min-v4.js'  
        // etc  
      ]);  
    });  
  });  
});
```

Assets Installation

```
[  
  "/48065a15ae3a16e845a528a3c0467487.svg",  
  "/6beb3319398d06b0635871740330ac7b.svg",  
  "/8450ddeb645c18bfff7890bccc95881a7.svg",  
  "/ba17b770588f23af1184e66179dc222d.svg",  
  "/2e030a00362fe30a27bc0750b0626797.svg",  
  "/3585e1891683a708eabb7ed43446cf82.svg",  
  "/main.e5d23aa4f5b56b06e5ec.bundle.js",  
  "/1.e5d23aa4f5b56b06e5ec.chunk.js",  
  "/main.e5d23aa4f5b56b06e5ec.css",  
  "/1.e5d23aa4f5b56b06e5ec.chunk.js.gz",  
  "/1.e5d23aa4f5b56b06e5ec.bundle.map.gz",  
  "/main.e5d23aa4f5b56b06e5ec.css.gz",  
  "/main.e5d23aa4f5b56b06e5ec.bundle.js.gz"  
]
```

Service Worker Libraries: Google

- sw-precache
- sw-toolbox

<https://github.com/GoogleChrome/sw-precache>
<https://github.com/GoogleChrome/sw-toolbox>

Service Worker Libraries:



- `workbox-sw`
- `workbox-cli`
- `workbox-build`
- `workbox-runtime-caching`
- `workbox-cache-expiration`
- `workbox-google-analytics`
- `workbox-background-sync`



<https://developers.google.com/web/tools/workbox/>



```
const WorkboxBuildWebpackPlugin = require('workbox-webpack-plugin')

module.exports = {
  plugins: [
    new WorkboxBuildWebpackPlugin({
      globDirectory: './build/',
      globPatterns: ['**\/*.{html,js,css}'],
      swSrc: './src/sw.js',
      swDest: './build/sw.js',
    });
  ]
}
```



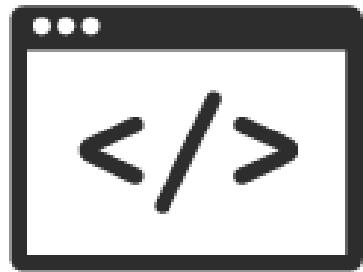
```
importScripts('/node_modules/workbox-sw/build/workbox-sw.js');

const workboxSW = new WorkboxSW();
workboxSW.precache([
  {
    url: '/index.html',
    revision: 'bb121c',
  }, {
    url: '/styles/main.css',
    revision: 'acd123',
  }, {
    url: '/scripts/main.js',
    revision: 'a32caa',
  }
]);
```

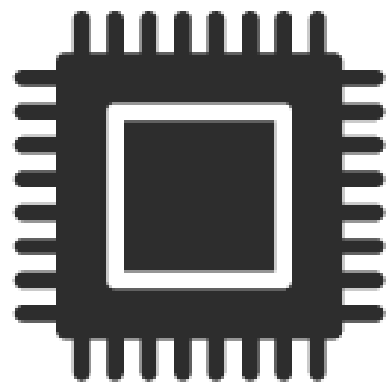
<https://developers.google.com/web/tools/workbox/>



Workbox - Strategies



Page



ServiceWorker

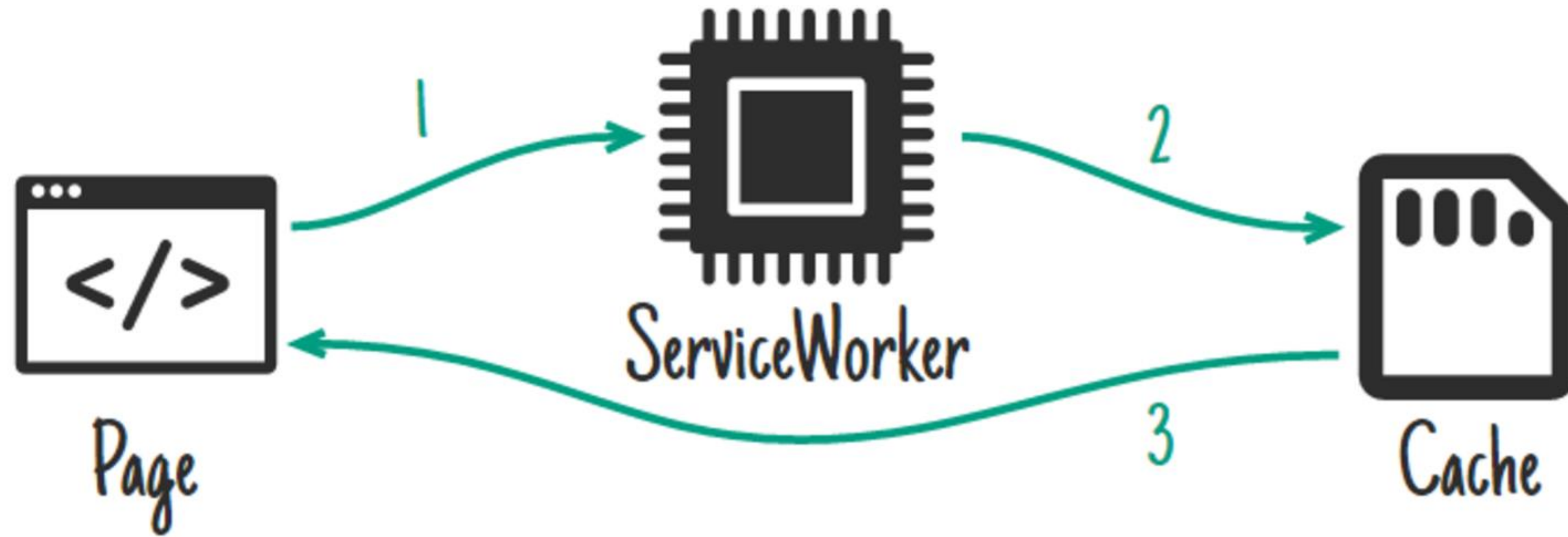


Cache



Network

Network Strategy: Cache Only

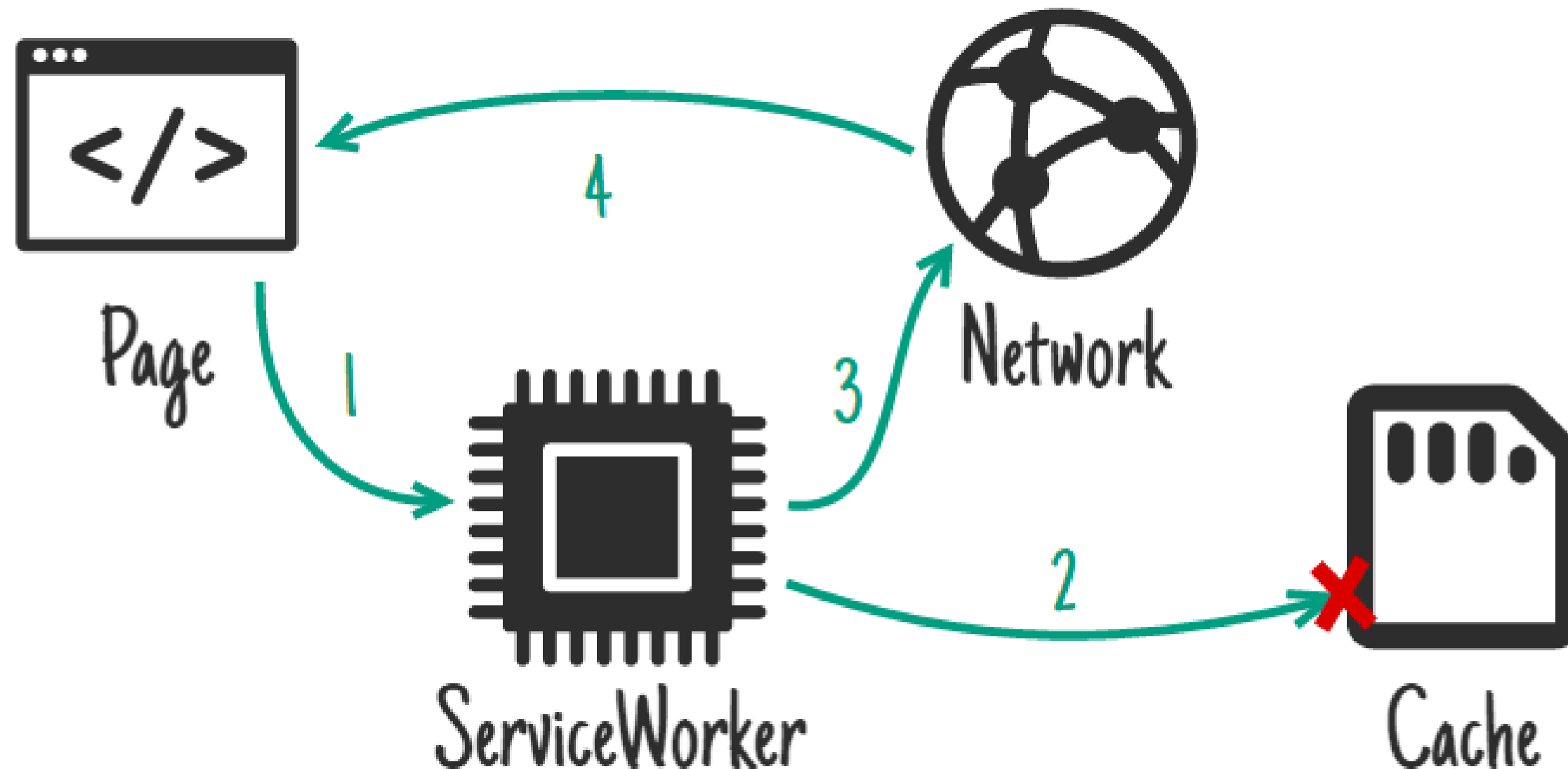


<https://jakearchibald.com/2014/offline-cookbook/>

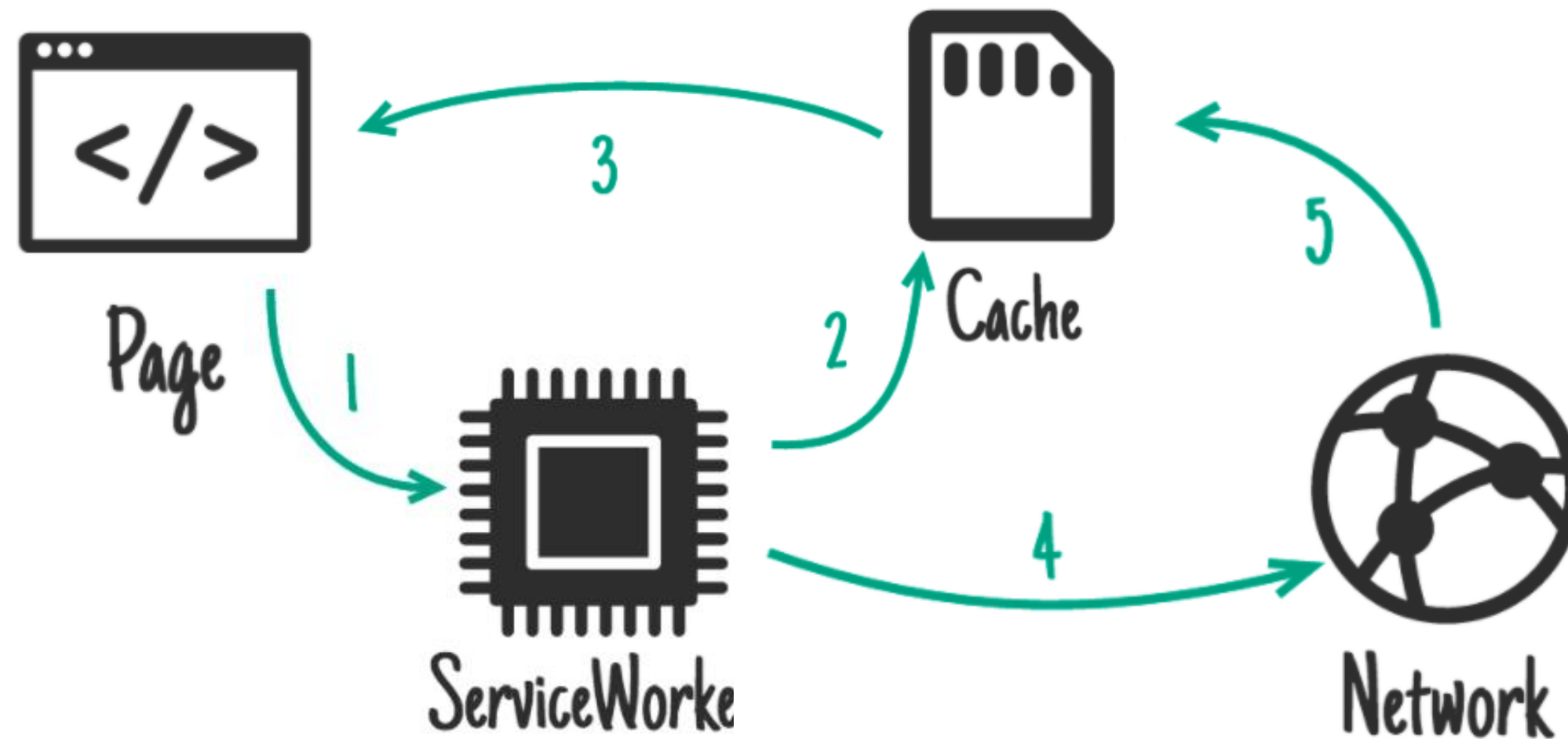


```
const workboxSW = new WorkboxSW();  
const cacheOnly= workboxSW.strategies.CacheOnly();  
workboxSW.router.registerRoute('/route', cacheOnly);
```

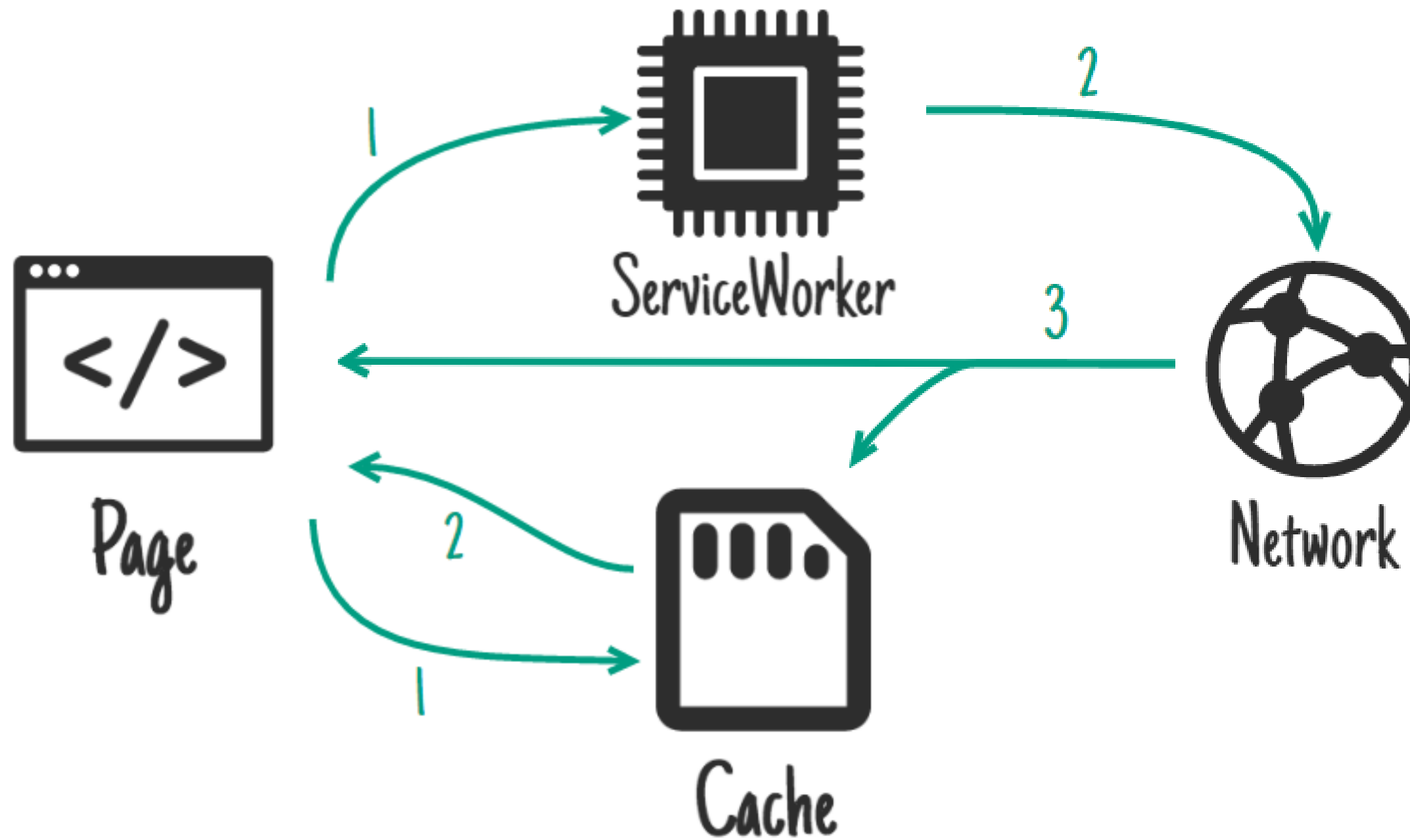
Network Strategy: Cache First



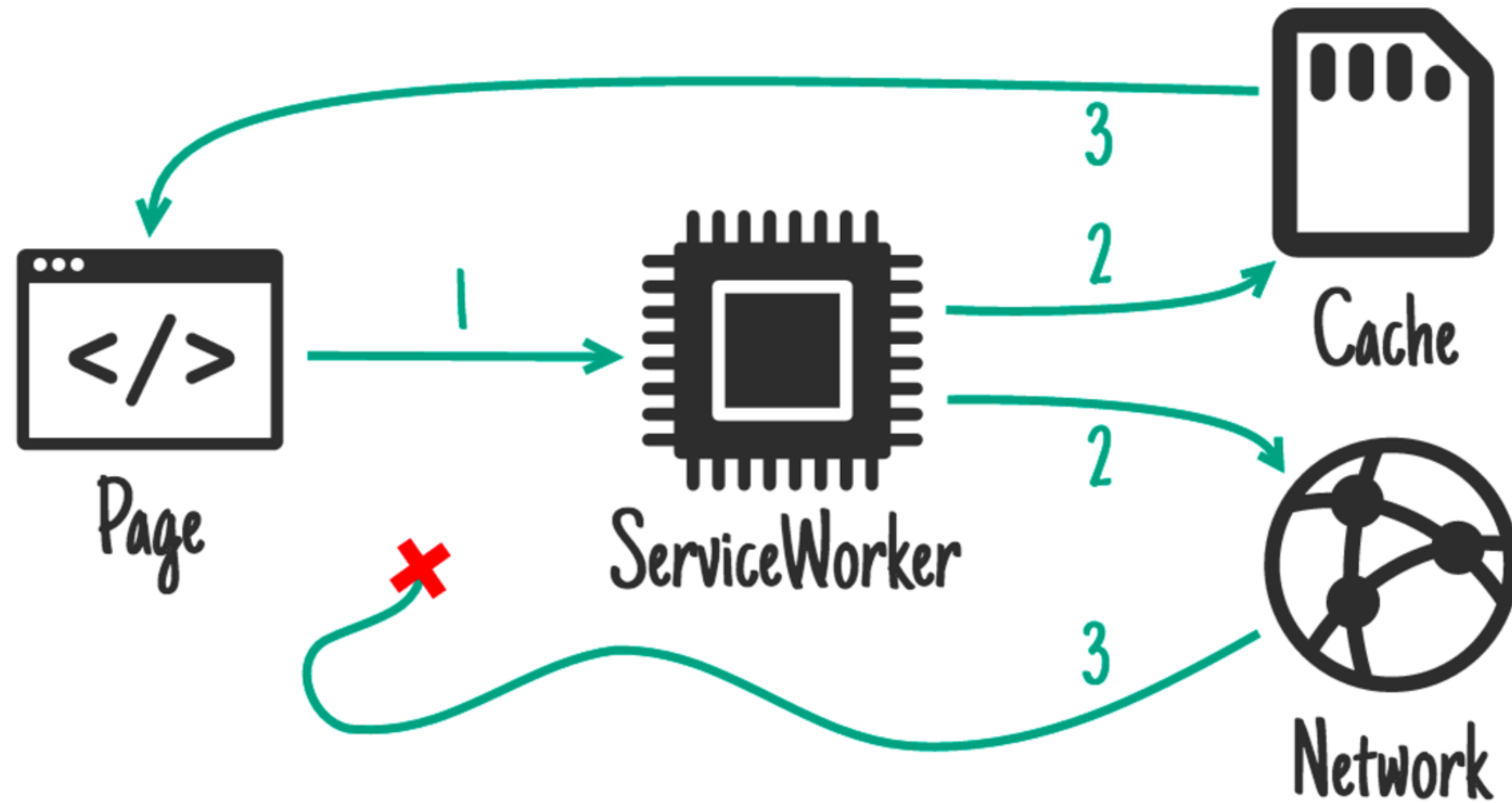
Network Strategy: Stale while revalidate



Network Strategy: Cache then Network



Network Strategy: Cache & Network race



<https://jakearchibald.com/2014/offline-cookbook/>



```
class CustomHandler extends workbox.runtimeCaching.Handler {  
  handle({ event }) {  
    console.log('CustomHandler is handling', event);  
  }  
}
```

Custom Logic

```
self.addEventListener('install', function(event) {  
  event.waitUntil(  
    caches.open('mycache-v1').then(function(cache) {  
  
      cache.addAll(  
        // large and unimportant resources  
      );  
  
      return cache.addAll(  
        // important resources  
      );  
  
    })  
  );  
});
```

SW Libraries: Webpack Offline Plugin



- + AppCache
- + Manifest

<https://github.com/NekR/offline-plugin>

Intermediate Result

- Offline status
- Requests
- Slow or intermittent Connection
- Cache Resources

Step 5: Storages

Storage Size



~ 30-40 Mb

Local Storage

- Limited to 5 Mb
- Store only Strings
- Persistent between browser restart

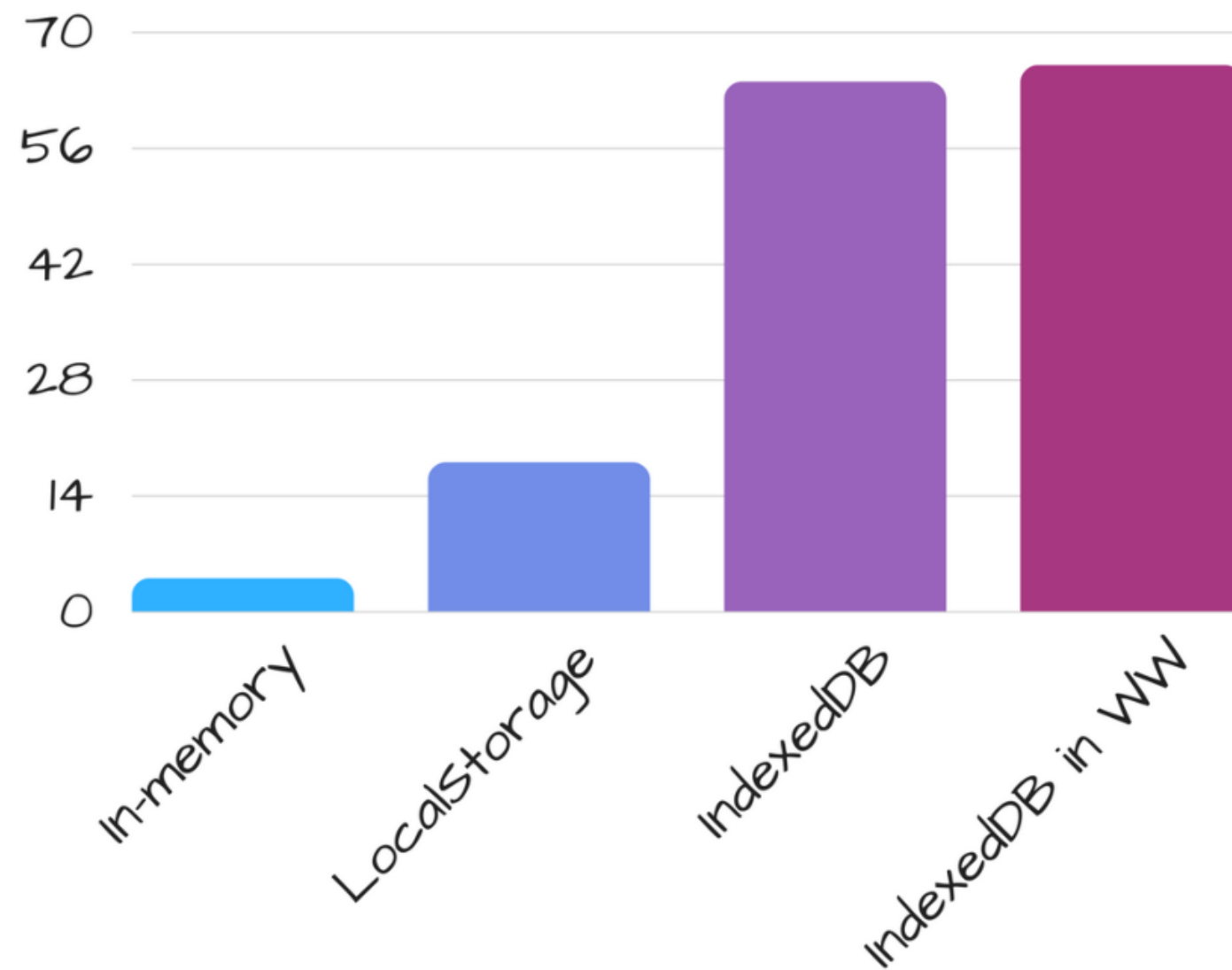
Web SQL

DEPRECATED

IndexedDB

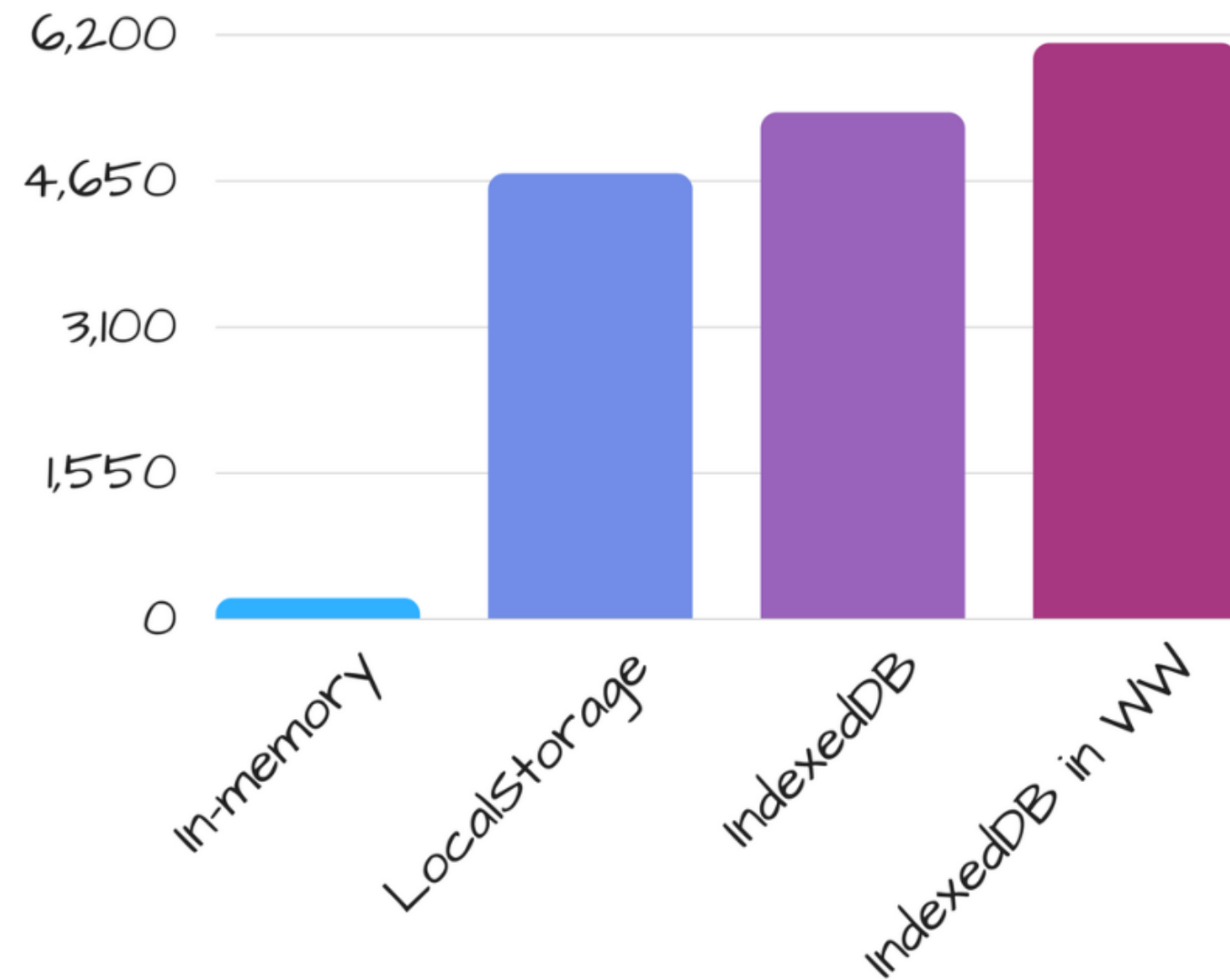
- More complex than Local Storage
- 50Mb + (calculate on quota)
- Stores Objects, Strings and others
- Async

Speed Tests: insert 1k objects



<https://nolanlawson.com/2015/09/29/indexeddb-websql-localstorage-what-blocks-the-dom/>

Speed Tests: insert 1m objects



<https://nolanlawson.com/2015/09/29/indexeddb-websql-localstorage-what-blocks-the-dom/>

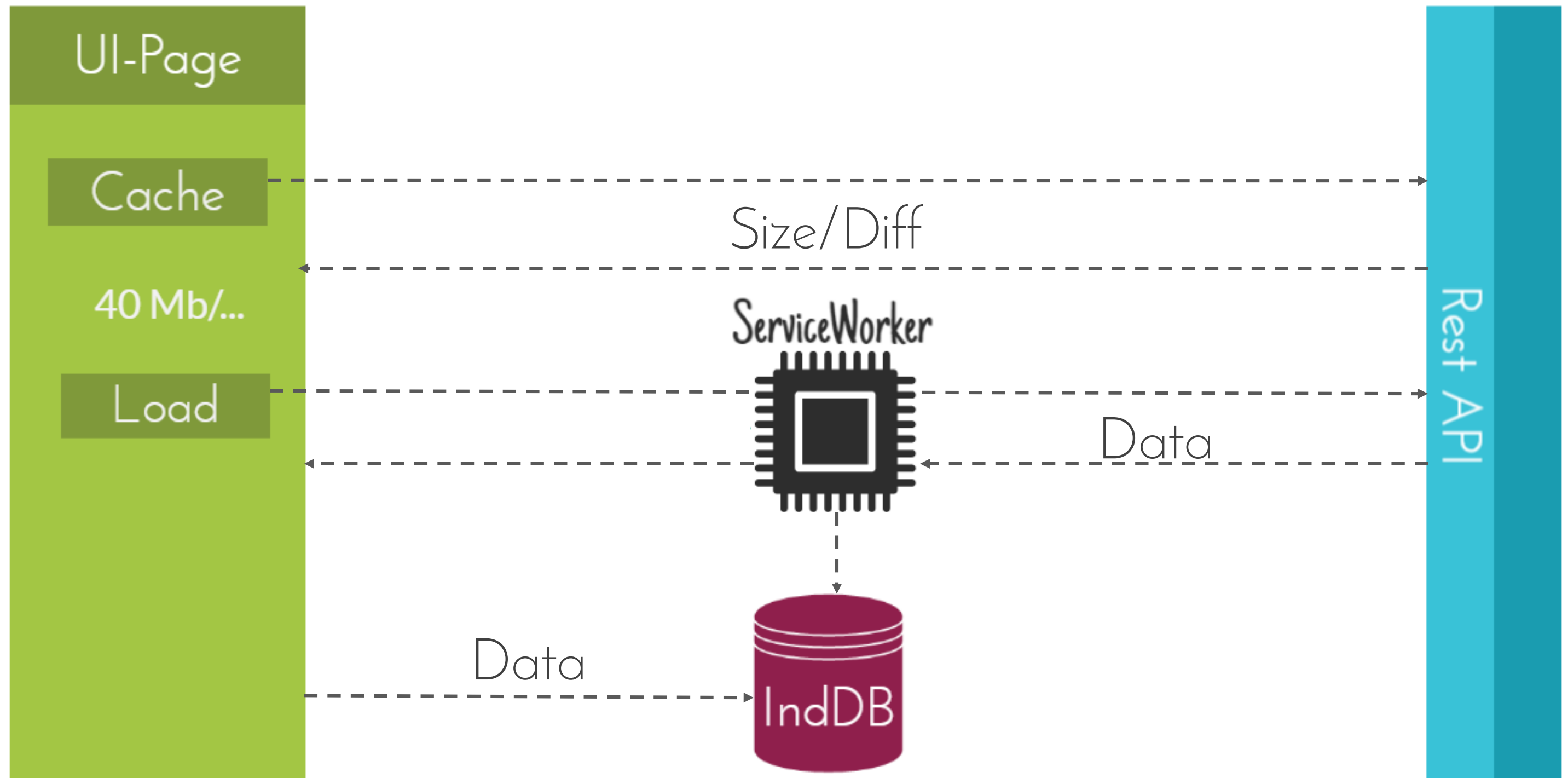
Storages Support in Service Workers

	 Chrome 55 more	 Firefox 50 more	 IE 11 more	 Edge 14 more	 Safari 10 more
Storage					
Cache	✓	✓	✗	✗	✗
<u>IndexedDB</u>	✓	✓	✗	✗	✗
LocalStorage	✗	✗	✗	✗	✗
SessionStorage	✗	✗	✗	✗	✗

<https://nolanlawson.github.io/html5workertest/>

Pull Strategy

Pull Strategy



Intermediate Result

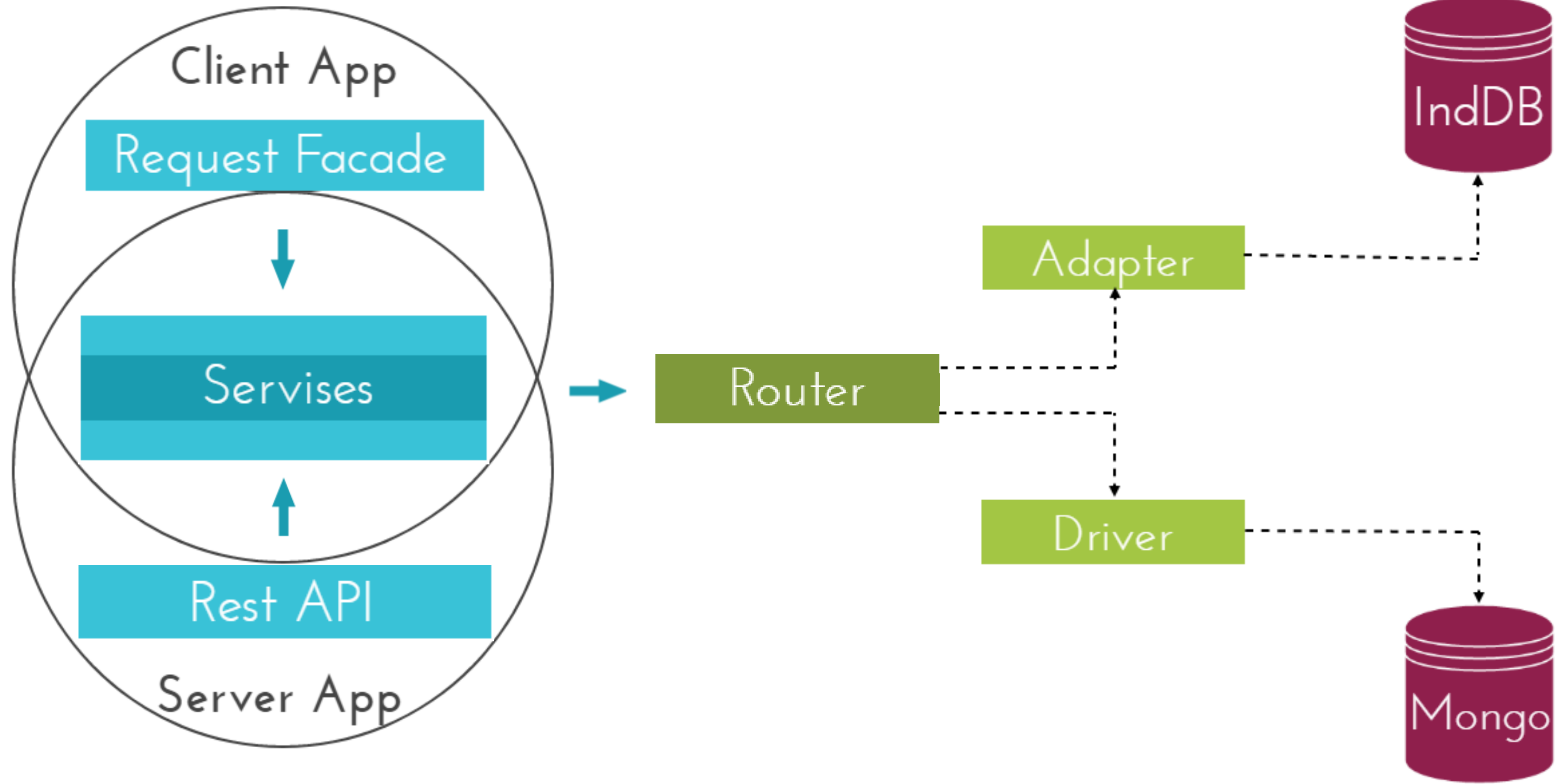
- Offline status
- Requests
- Slow or intermittent Connection
- Cache Resources
- Persistence Data

Business Logic?

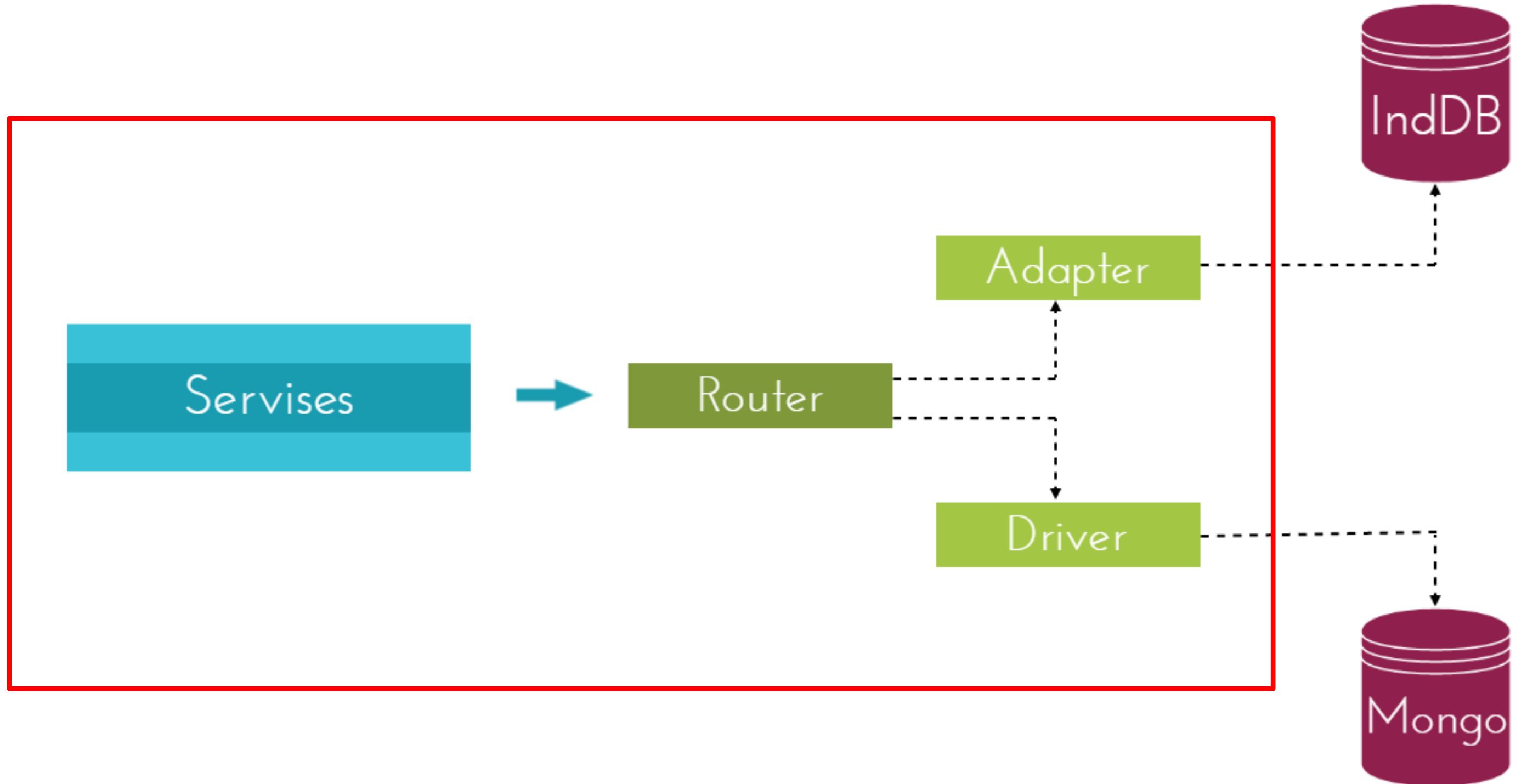


Step 6: Isomorphism

Isomorphism



Mongo API Everywhere



Mongo API Everywhere

Adapter API

=

Driver API

Step 7: Adapters

NeDB

 louischatriot / nedb

 Watch ▾

235

★ Star

6,393

 Fork

427

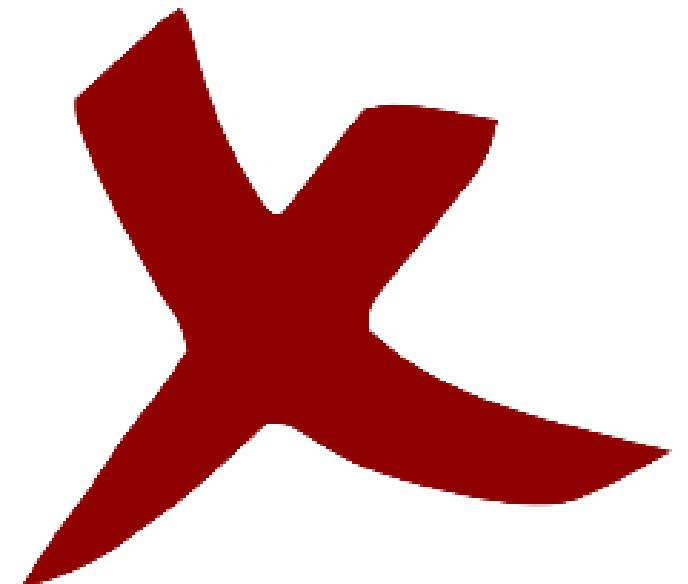
6393



<https://github.com/louischatriot/nedb>

NeDB

- Basic Querying
- Operators (\$lt, \$lte, \$gt, \$gte, \$in, \$nin, \$ne, \$exists, \$regex)
- Logical operators \$or, \$and, \$not, \$where
- Sorting and paginating
- Projections
- Indexing
- File Persistence



< LokiJS



Overview

Repositories 48

Stars 239

Popular repositories

LokiJS

javascript embeddable / in-memory database

JavaScript

★ 3.2k

🔗 272

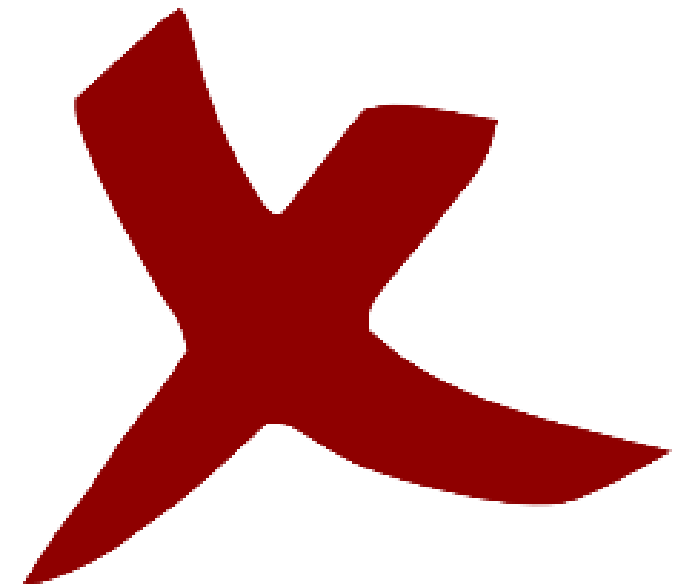
3290



<http://lokijs.org/#/>



- Fast Performance!
- Indexing / Secondary Indexing / Unique Indexing
- Persistence IndexedDB Adapter
- Partial compatibility with MongoDB API



miniMONGO

mWater / minimongo

Watch

39

★ Star

578

Fork

62

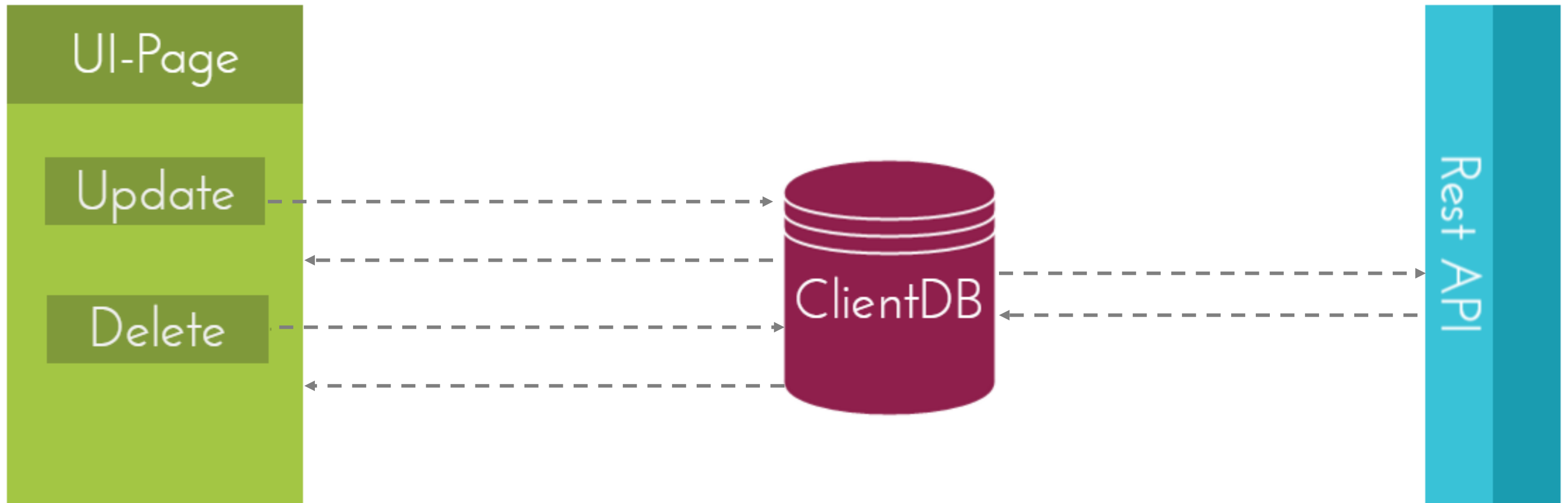
578



<https://github.com/mWater/minimongo>

Push Strategy?

Push Strategy



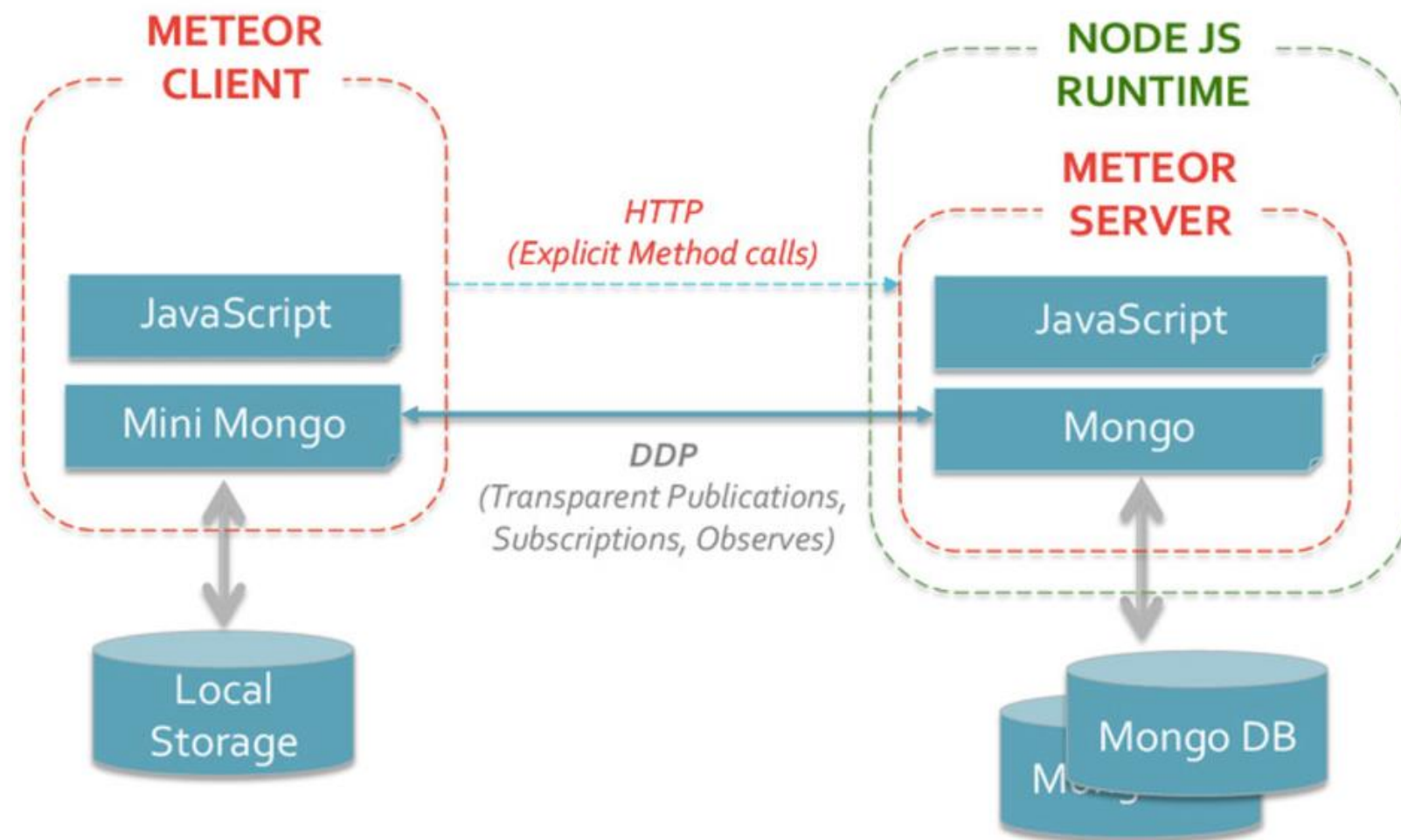


<https://pouchdb.com/>



- Omnibusable on browsers, nodejs, election, cordova, react-native and every other javascript-runtime
- Replication between client and server-data, compatible with PouchDB, CouchDB and IBM Cloudant
- **Mango**-Query exactly like you know from mongoDB and mongoose

METEOR



<https://www.meteor.com/>



SQL

```
INSERT INTO users(user_id,  
                  age,  
                  name)  
VALUES ("f62255a8259f",  
       30,  
       Peter)
```

ReQL

```
r.table("users").insert({  
  userId: "f62255a8259f",  
  age: 30,  
  name: "Peter"  
})
```

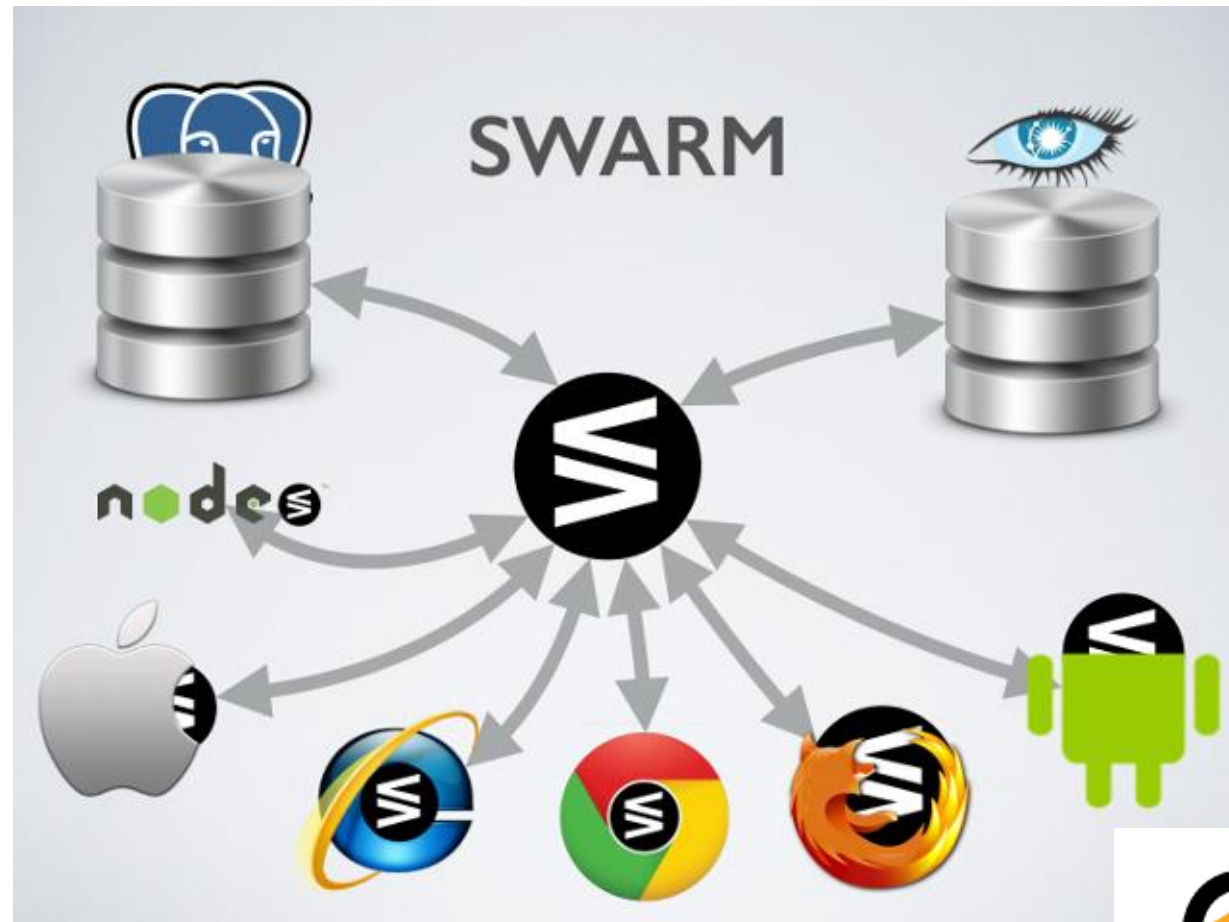


Horizon is a realtime, open-source backend for JavaScript apps



<https://horizon.io/>

What else?



And what the result?

Final Result

- Offline status
- Requests
- Slow or intermittent Connection
- Cache Resources
- Persistence Data
- Business Logic
- Partial Sync

Result for Insurance Company

- Offline Support
- 1 month of development
- Up to 5% profit



Thank you!

Questions?

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bogachuk.alex@gmail.com