
OFFLINE FIRST!

Rowdy Rabouw

- Born and raised in Gouda, The Netherlands
- Front-End Focused Senior DevOps Engineer
- Build my first website in 1996




PROGRESSIVE WEB APP

PWA

OFFLINE FIRST!
@rowdyrabouw



PWA features

- Linkable (url's)
- Secure (https)
- Discoverable (search engines)
- Responsive (works on every screen resolution)
- Progressively enhanced (excels on modern browsers)
- Installable (home screen)
- Re-engageable (push notifications)
- Network-independent (can work offline)

https://developer.mozilla.org/en-US/docs/Web/Progressive_web_apps/Introduction



Jfokus

jfokus.se

Incognito

Home Register Speakers Talks Schedule Videos

Stockholm
6-8 Feb 2023

SEASON 2023
Jfokus
6-8 FEB
59°19'48"N • 18°3'22"E

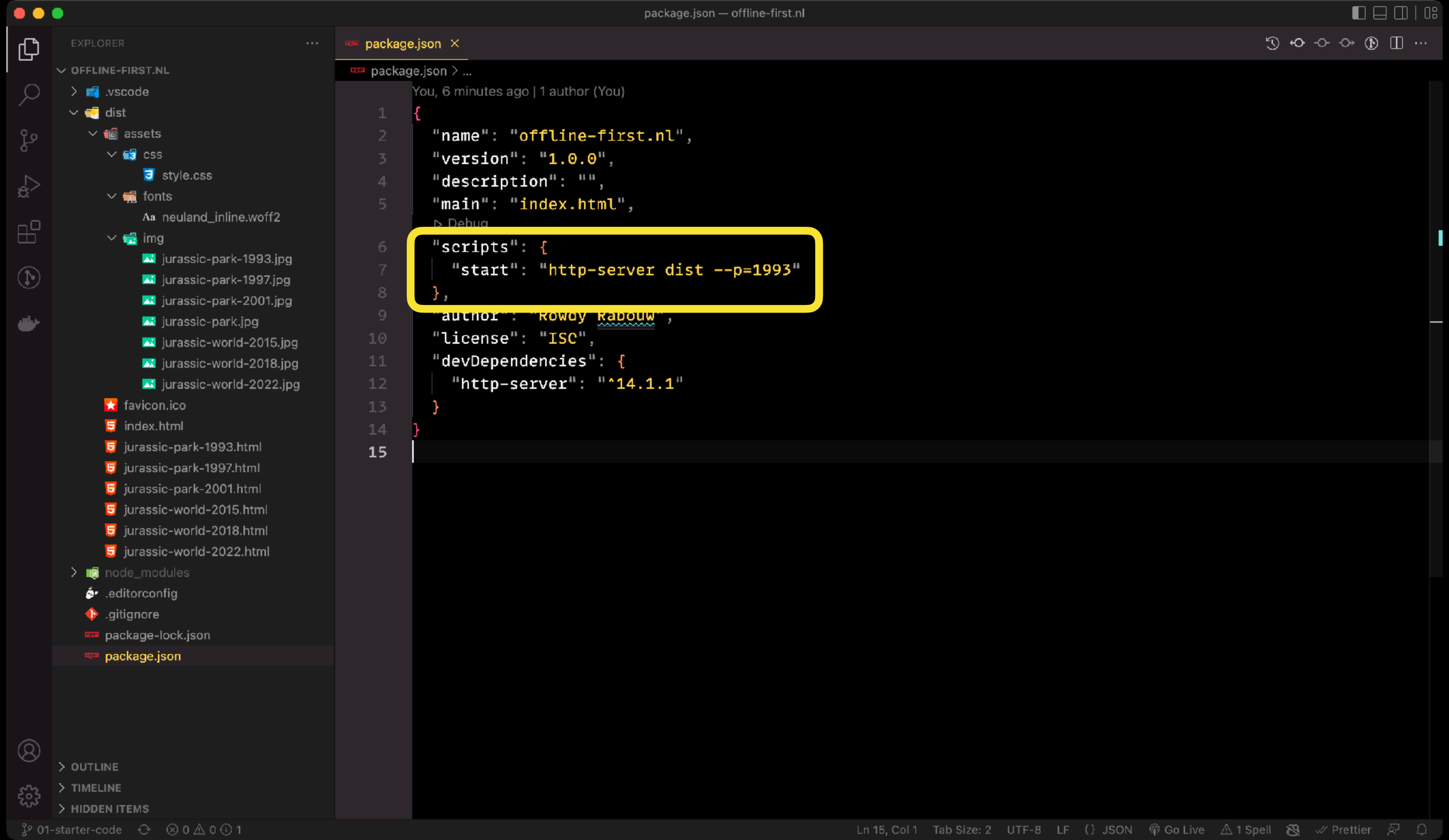
Registration is open

REGISTER NOW

Community events 2023

Jfokus continues to support the developer community in Stockholm with MeetUps at the conference center on Tuesday evening. All Jfokus attendees are welcome to join. Follow


STARTER CODE
https://github.com/rowdyrabouw/offline-first.nl/tree/01-starter-code


package.json — offline-first.nl
EXPLORER
OFFLINE-FIRST.NL
.vscode
dist
assets
css
style.css
fonts
neuland_inline.woff2
img
jurassic-park-1993.jpg
jurassic-park-1997.jpg
jurassic-park-2001.jpg
jurassic-park.jpg
jurassic-world-2015.jpg
jurassic-world-2018.jpg
jurassic-world-2022.jpg
favicon.ico
index.html
jurassic-park-1993.html
jurassic-park-1997.html
jurassic-park-2001.html
jurassic-world-2015.html
jurassic-world-2018.html
jurassic-world-2022.html
node_modules
.editorconfig
.gitignore
package-lock.json
package.json
OUTLINE
TIMELINE
HIDDEN ITEMS
package.json
package.json > ...
You, 6 minutes ago | 1 author (You)
{
"name": "offline-first.nl",
"version": "1.0.0",
"description": "",
"main": "index.html",
Debug
"scripts": {
"start": "http-server dist --p=1993"
},
"author": "Rowdy Rabouw",
"license": "ISC",
"devDependencies": {
"http-server": "^14.1.1"
}
}
01-starter-code
Ln 15, Col 1
Tab Size: 2
UTF-8
LF
JSON
Go Live
1 Spell
Prettier

/sw.js

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.ico" />
  </head>
  <body>
    <main>
      <h1>Jurassic Park</h1>
      <img src="assets/img/jurassic-park.jpg" alt="" />
      <h2>Welcome to... Jurassic Park!</h2>
      <p>...</p>
      <ol>
        <li><a href="/jurassic-park-1993.html">Jurassic Park</a></li>
        ...
      </ol>
    </main>
  </body>
</html>
```

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does make it easy to lose track of exactly what happens in one or two along the way.

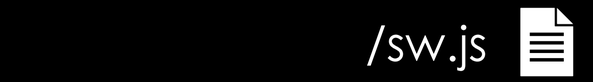

SERVICE WORKERS
https://github.com/rowdyrabouw/offline-first.nl/tree/02-add-service-worker

Service Workers

- JavaScript file
- runs in the background in a separate thread; non-blocking
- scoped to a website
- can’t modify page; no access to DOM
- asynchronous; promises or async/await
- event driven


BROWSER
MORE JAVASCRIPT
SERVICE WORKER
SERVER

/sw.js



```
self.addEventListener("install", (event) => {
  console.log("%c[sw.js] Service Worker installed", "color: #FEC233");
});

self.addEventListener("activate", (event) => {
  console.log("%c[sw.js] Service Worker activated", "color: #FEC233");
  // ensure that the Service Worker is activated correctly (fail-safe)
  return self.clients.claim();
});
```




/app.js



```
if ("serviceWorker" in navigator) {
  window.addEventListener("load", () => {
    navigator.serviceWorker
      .register("sw.js")
      .then((reg) => {
        console.log("%c[app.js] Service Worker registered", "color: #00ABD2");
      })
      .catch((e) => {
        console.error(
          "%c[app.js] Error during service worker registration:",
          e
        );
      });
  });
}
```




/index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.png" />
    <script src="assets/js/app.js"></script>
  </head>
  <body>
    <main>
      <h1>Jurassic Park</h1>
      <img src="assets/img/jurassic-park.jpg" alt="" />
      <h2>Welcome to... Jurassic Park!</h2>
      <p>...</p>
      <ol>
        <li><a href="/jurassic-park-1993.html">Jurassic Park</a></li>
        ...
      </ol>
    </main>
  </body>
</html>
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



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Network | Console | Application | Performance insights | Sources | Elements

Application
- Manifest
- Service Workers
- Storage

Storage
- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
- Back/forward cache

Background Services
- Background Fetch

Service Workers

Offline | Update on reload | Bypass for network

Service workers from other origins

See all registrations

Console | What's New | Issues

top | Filter | Default levels | No Issues

>

Service Workers - CR

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

Usage: % of all users ?
Global: 94.29% + 0.09% = 94.38%

Current aligned | Usage relative | Date relative | Filtered | All

IE	Edge	Firefox	Chrome	Safari	Opera	Safari on iOS	Opera Mini	Android Browser	Opera Mobile	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	QQ Browser	Baidu Browser	KaiOS Browser
		2-32														
		1 33-43														
		44														
		3 45														
		46-51														
		3 52														
		53-59														
		3 60														
	12-14	61-67	4-39		10-26											
	2 15-16	3 68	40-44	3.1-11	27-31	3.2-11.2										
6-10	17-102	69-101	45-102	11.1-15.4	32-85	11.3-15.4		2.1-4.4.4	12-12.1				4-16.0			
11	103	102	103	15.5	86	15.5	all	103	64	103	101	12.12	17.0	10.4	7.12	2.5
		103-104	104-106	16.0-TP	87	16.0										

Notes | Test on a real browser | Known issues (0) | Resources (6) | Feedback


STATIC CACHE
https://github.com/rowdyrabouw/offline-first.nl/tree/03-add-static-cache

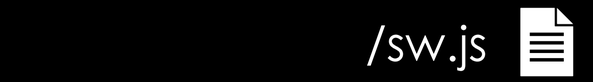
/sw.js



```
const STATIC_CACHE = "static-v1";
```



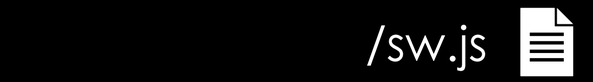

/sw.js



```
const STATIC_CACHE = "static-v1";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.png",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
];
```




/sw.js



```
const STATIC_CACHE = "static-v1";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.png",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
];

self.addEventListener("install", (event) => {
  console.log("%c[sw.js] Service Worker installed", "color: #FEC233");




});
```




/sw.js

```
const STATIC_CACHE = "static-v1";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.png",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
];

self.addEventListener("install", (event) => {
  console.log("%c[sw.js] Service Worker installed", "color: #FEC233");
  event.waitUntil(
    caches.open(STATIC_CACHE).then((cache) => {
      cache.addAll(STATIC_FILES).then(() => {
        console.log("%c[sw.js] Files added to static cache", "color: #FEC233");
        self.skipWaiting();
      });
    })
  );
});
```

/app.js



```
if ("serviceWorker" in navigator) {
  window.addEventListener("load", () => {
    navigator.serviceWorker
      .register("sw.js")
      .then((reg) => {
        console.log("%c[app.js] Service Worker registered", "color: #00ABD2");
      })
      .catch((e) => {
        console.error("%c[app.js] Error during service worker registration:", e);
      });
  });
}
```




/app.js

```
if ("serviceWorker" in navigator) {
  window.addEventListener("load", () => {
    navigator.serviceWorker
      .register("sw.js")
      .then((reg) => {
        console.log("%c[script.js] Service Worker registered", "color: #00ABD2");
        reg.onupdatefound = () => {
          const installingWorker = reg.installing;
          installingWorker.onstatechange = () => {
            if (installingWorker.state === "installed") {
              console.log("%c[app.js] New or updated content is available",
                          "color: #00ABD2");
              if (confirm("A new version is available.\n
                           Would you like to load the new version?")) {
                window.location.reload();
              }
            }
          };
        };
      })
      .catch((e) => {
        console.error("%c[app.js] Error during service worker registration:", e);
      });
  });
}
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

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Network | Console | Application | Performance insights | Sources | Elements | Recorder | »

Application
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- Storage

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- Back/forward cache

Background Services
- Background Fetch
- Background Sync
- Notifications
- Payment Handler

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 03/07/2022, 20:58:27

Status: #0 activated and is running stop

Clients: http://localhost:1993/ focus

Push: Test push message from DevTools. — Push

Sync: test-tag-from-devtools — Sync

Periodic Sync: test-tag-from-devtools — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#0	Install	
#0	Wait	
#0	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

```
[app.js] Service Worker registered                app.js:6
[sw.js] Service Worker installed                  sw.js:2
[sw.js] Service Worker activated                  sw.js:6
>
```


FETCH CACHE
https://github.com/rowdyrabouw/offline-first.nl/tree/04-fetch-static-cache

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



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Network | Console | Application | Performance insights | Sources | Elements | Recorder

Preserve log | Disable cache | No throttling

Invert | Hide data URLs | All | Fetch/XHR | JS | CSS | Img | Media | Font | Doc | WS | Wasm | Manifest | Other

Has blocked cookies | Blocked Requests | 3rd-party requests

10 ms | 20 ms | 30 ms | 40 ms | 50 ms | 60 ms | 70 ms | 80 ms | 90 ms | 100 ms | 110

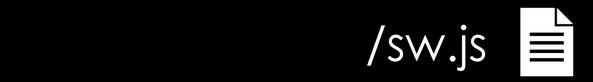
Recording network activity...

Perform a request or hit ⌘ R to record the reload.

Learn more

Console | What's New | Issues

top | Filter | Default levels | No Issues



```
self.addEventListener("fetch", (event) ⇒ {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) ⇒ {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch from the server
        return fetch(event.request);
      }
    })
  );
});
```




Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



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Has blocked cookies | Blocked Requests | 3rd-party requests

10 ms | 20 ms | 30 ms | 40 ms | 50 ms | 60 ms | 70 ms | 80 ms | 90 ms | 100 ms | 110

Name	Status	Type	Initiator	Size	Time	Waterfall
localhost	200	document	Other	2.0 kB	8 ms	
style.css	200	stylesheet	(index)	1.7 kB	5 ms	
app.js	200	script	(index)	1.2 kB	7 ms	
jurassic-park.jpg	200	jpeg	(index)	114 kB	7 ms	
neuland_inline.woff2	200	font	style.css	29.6 kB	3 ms	

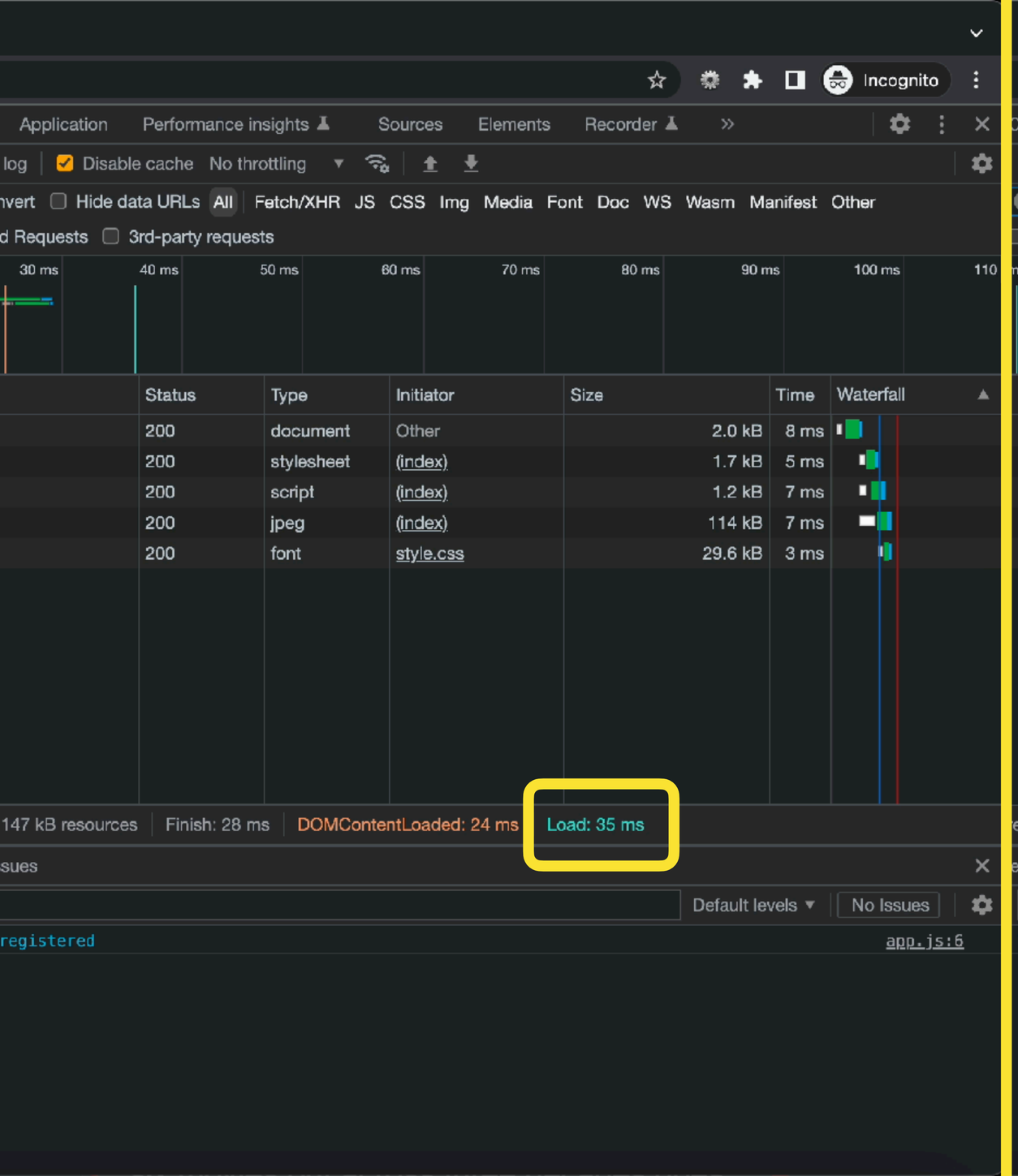
5 requests | 148 kB transferred | 147 kB resources | Finish: 28 ms | DOMContentLoaded: 24 ms | Load: 35 ms

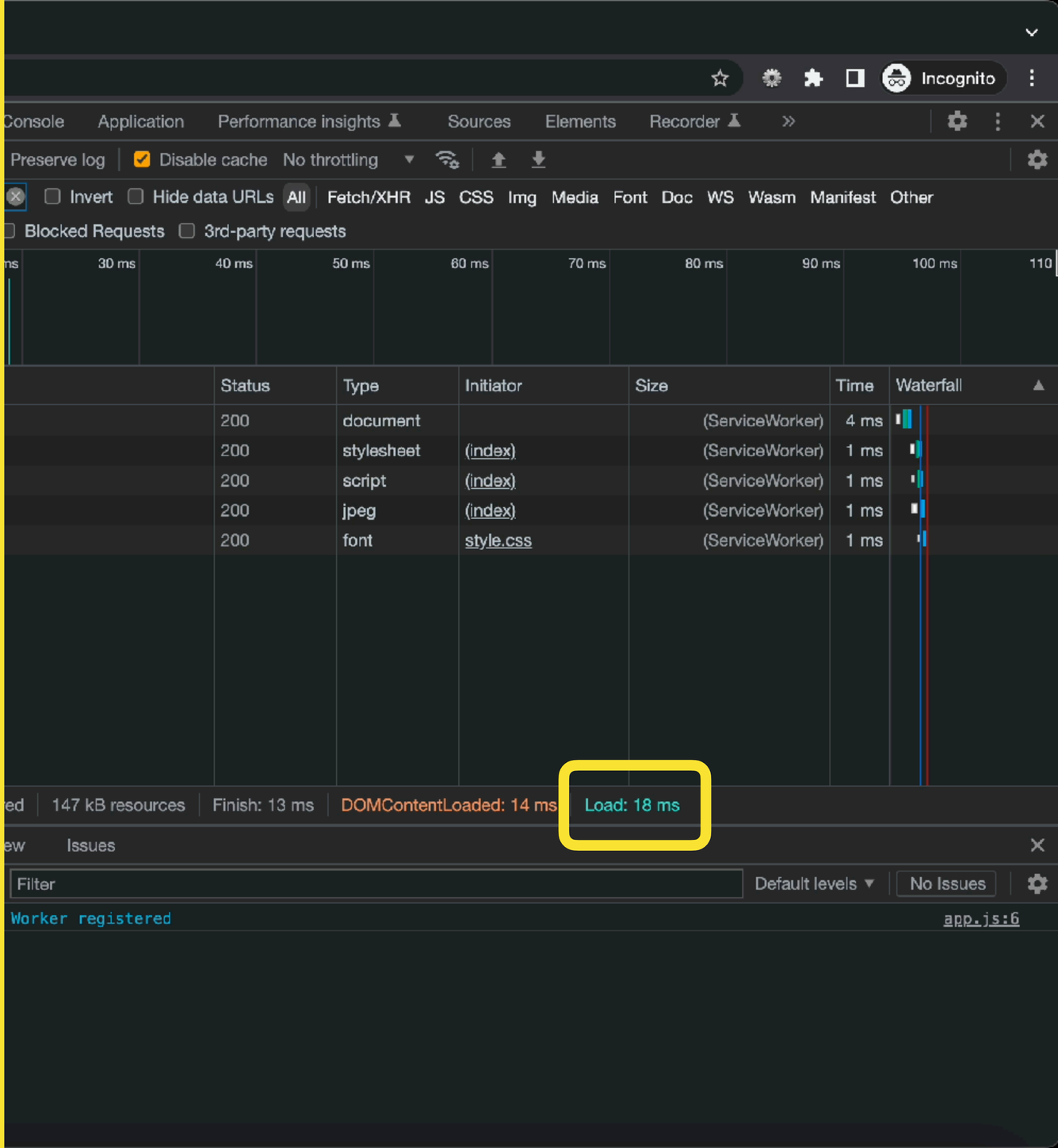
Console | What's New | Issues

top | Filter | Default levels | No Issues

[script.js] Service Worker registered app.js:6

>


Incognito
Application
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log
Disable cache
No throttling
nvert
Hide data URLs
All
Fetch/XHR
JS
CSS
Img
Media
Font
Doc
WS
Wasm
Manifest
Other
d Requests
3rd-party requests
30 ms
40 ms
50 ms
60 ms
70 ms
80 ms
90 ms
100 ms
110
Status
Type
Initiator
Size
Time
Waterfall
200 document Other 2.0 kB 8 ms
200 stylesheet (index) 1.7 kB 5 ms
200 script (index) 1.2 kB 7 ms
200 jpeg (index) 114 kB 7 ms
200 font style.css 29.6 kB 3 ms
147 kB resources
Finish: 28 ms
DOMContentLoaded: 24 ms
Load: 35 ms
sues
Default levels
No Issues
registered
app.js:6


Incognito
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Hide data URLs
All
Fetch/XHR
JS
CSS
Img
Media
Font
Doc
WS
Wasm
Manifest
Other
Blocked Requests
3rd-party requests
30 ms
40 ms
50 ms
60 ms
70 ms
80 ms
90 ms
100 ms
110
Status
Type
Initiator
Size
Time
Waterfall
200 document (ServiceWorker) 4 ms
200 stylesheet (index) (ServiceWorker) 1 ms
200 script (index) (ServiceWorker) 1 ms
200 jpeg (index) (ServiceWorker) 1 ms
200 font style.css (ServiceWorker) 1 ms
147 kB resources
Finish: 13 ms
DOMContentLoaded: 14 ms
Load: 18 ms
Issues
Filter
Default levels
No Issues
Worker registered
app.js:6



Jurassic World VelociCoaster — Universal Orlando Resort

OFFLINE FIRST!
@rowdyrabouw


OFFLINE FALLBACK
https://github.com/rowdyrabouw/offline-first.nl/tree/05-offline-fallback

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



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Has blocked cookies | Blocked Requests | 3rd-party requests

10 ms | 20 ms | 30 ms | 40 ms | 50 ms | 60 ms | 70 ms | 80 ms | 90 ms | 100 ms | 110

Recording network activity...

Perform a request or hit ⌘ R to record the reload.

Learn more

Console | What's New | Issues

top | Filter | Default levels | No Issues

/offline.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park - offline</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.png" />
    <script src="assets/js/app.js"></script>
  </head>
  <body>
    <main>
      <h1>Jurassic Park is closed</h1>
      <img src="assets/img/jurassic-park.jpg" alt="" />
      <h2>It seems you are currently offline ...</h2>
      <p><strong>We're sorry, this page hasn't been cached yet :-(</strong></p>
      <p>But why don't you try one of our <a href="/">other pages</a>?</p>
    </main>
  </body>
</html>
```



```
const STATIC_CACHE = "static-v1";
```




/sw.js

```
const STATIC_CACHE = "static-v2";
```

/sw.js



```
const STATIC_CACHE = "static-v2";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.ico",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",

];
```




/sw.js



```
const STATIC_CACHE = "static-v2";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.ico",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
  "offline.html",
];
```




/sw.js



```
self.addEventListener("fetch", (event) ⇒ {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) ⇒ {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch from the server
        return fetch(event.request)




      }
    })
  );
});
```




/sw.js

```
self.addEventListener("fetch", (event) => {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) => {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch from the server
        return fetch(event.request).catch(() => {
          return caches.open(STATIC_CACHE).then((cache) => {

              return cache.match("/offline.html");

          });
        });
      }
    })
  );
});
```

/sw.js

```
self.addEventListener("fetch", (event) => {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) => {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch from the server
        return fetch(event.request).catch(() => {
          return caches.open(STATIC_CACHE).then((cache) => {
            if (event.request.headers.get("accept").includes("text/html")) {
              return cache.match("/offline.html");
            }
          });
        });
      }
    })
  );
});
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



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Cache
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  - static-v1 - http://localhost:1993
- Back/forward cache

Background Services
- Background Fetch
- Background Sync
- Notifications

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 16:09:15

Status: #0 activated and is running stop

Push: `Test push message from DevTools.` — Push

Sync: `test-tag-from-devtools` — Sync

Periodic Sync: `test-tag-from-devtools` — Periodic Sync

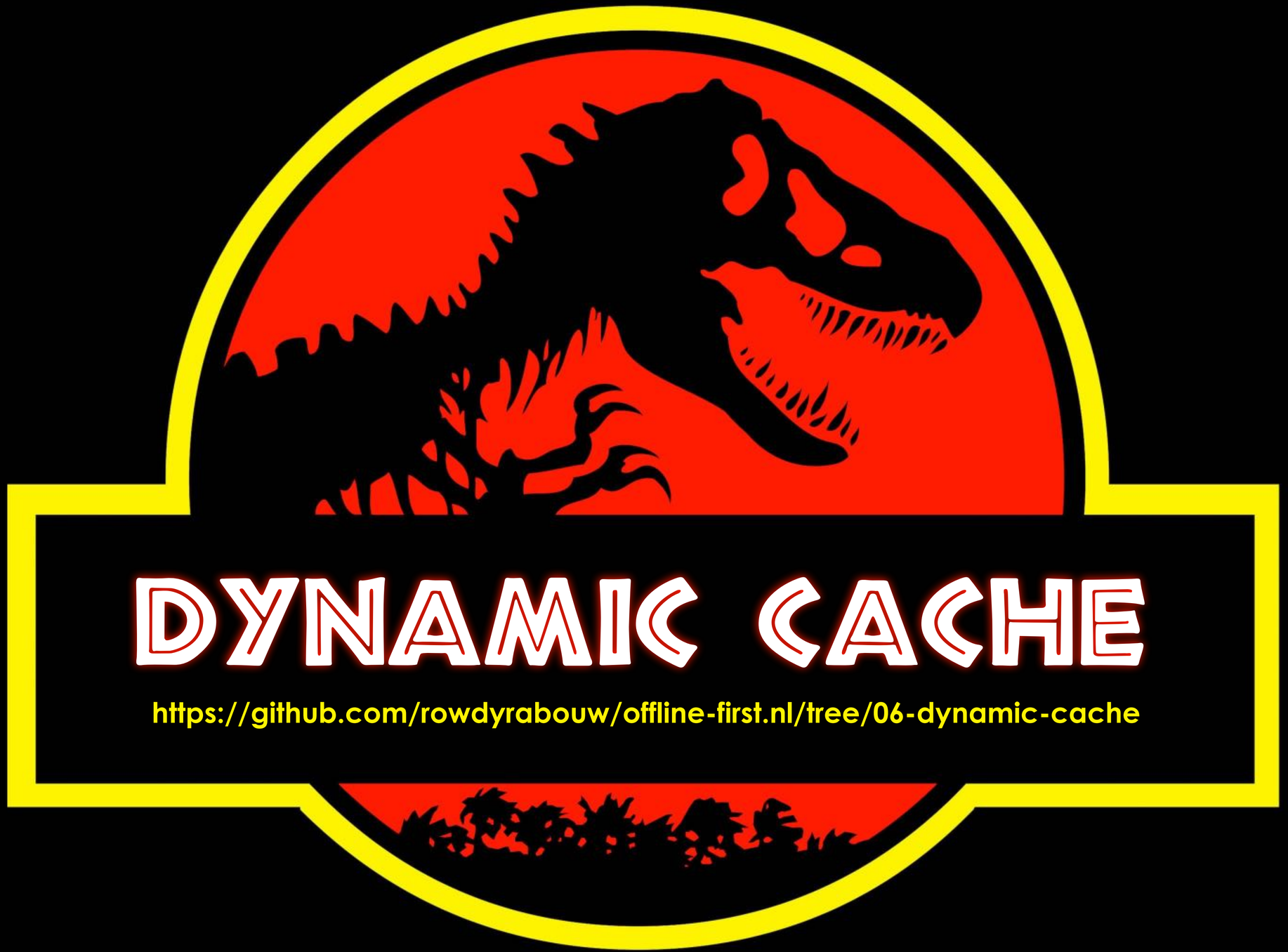
Update Cycle

Version	Update Activity	Timeline
#0	Install	
#0	Wait	
#0	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

```
[script.js] Service Worker registered                app.js:6
>
```


DYNAMIC CACHE
https://github.com/rowdyrabouw/offline-first.nl/tree/06-dynamic-cache



```
const DYNAMIC_CACHE = "dynamic-v1";
```




/sw.js

```
self.addEventListener("fetch", (event) => {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) => {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch it from the server and save to cache
        return fetch(event.request)

          .catch(() => {
            return caches.open(STATIC_CACHE).then((cache) => {
              if (event.request.headers.get("accept").includes("text/html")) {
                return cache.match("/offline.html");
              }
            });
          });
      }
    })
  );
});
```

/sw.js

```
self.addEventListener("fetch", (event) => {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches.match(event.request).then((response) => {
      if (response) {
        // return from cache
        return response;
      } else {
        // fetch it from the server and save to cache
        return fetch(event.request)
          .then((res) => {
            return caches.open(DYNAMIC_CACHE).then((cache) => {
              cache.put(event.request.url, res.clone());
              return res;
            });
          })
          .catch(() => {
            return caches.open(STATIC_CACHE).then((cache) => {
              if (event.request.headers.get("accept").includes("text/html")) {
                return cache.match("/offline.html");
              }
            });
          });
      }
    })
  );
});
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does

Network | Console | Application | Performance insights | Sources | Elements | Recorder | »

Application
- Manifest
- Service Workers
- Storage

Storage
- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - static-v1 - http://localhost:1993
  - static-v2 - http://localhost:1993
- Back/forward cache

Background Services
- Background Fetch
- Background Sync

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 16:17:05

Status: #1 activated and is running stop

Push: Test push message from DevTools. — Push

Sync: test-tag-from-devtools — Sync

Periodic Sync: test-tag-from-devtools — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#1	Install	
#1	Wait	
#1	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

>

The Lost World: Jurassic Park

localhost:1993/jurassic-park-1997.html

Incognito

THE LOST WORLD: JURASSIC PARK



PLOT SYNOPSIS

The movie opens with an incident on the island of Isla Sorna (code-named "Site B" by the InGen company), located in the vicinity of Isla Nublar, where the film "Jurassic Park" took place.

Network | Console | Application | Performance insights | Sources | Elements | Recorder

Application
- Manifest
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Storage
- Local Storage
- Session Storage
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- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - static-v1 - http://localhost:1993
  - static-v2 - http://localhost:1993
- Back/forward cache

Background Services
- Background Fetch

Filter by Path

#	Name	Respons..	Content-..	Content-..	Time Ca...	Vary Hea..
0	/assets/img/jurassic-park-1993.jpg	basic	image/jpeg	137,013	04/07/2...	
1	/assets/img/jurassic-park-1997.jpg	basic	image/jpeg	74,859	04/07/2...	
2	/jurassic-park-1993.html	basic	text/html...	9,463	04/07/2...	
3	/jurassic-park-1997.html	basic	text/html...	10,744	04/07/2...	

Select a cache entry above to preview

Total entries: 4

Console | What's New | Issues

top | Filter | Default levels | No Issues

[script.js] Service Worker registered app.js:6


CACHE CLEANUP
https://github.com/rowdyrabouw/offline-first.nl/tree/07-cache-cleanup

Jurassic Park - offline

localhost:1993/jurassic-park-2001.html

Incognito

JURASSIC PARK IS CLOSED



IT SEEMS YOU ARE CURRENTLY OFFLINE ...

We're sorry, this page hasn't been cached yet :-(

But why don't you try one of our other pages?

Network | Console | Application | Performance insights | Sources | Elements | Recorder

Application
- Manifest
- Service Workers
- Storage

Storage
- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - static-v1 - http://localhost:1993
  - static-v2 - http://localhost:1993
  - dynamic-v1 - http://localhost:1

Background Services
- Background Fetch

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 16:17:38

Status: #2 activated and is running stop

Push: Test push message from DevTools. — Push

Sync: test-tag-from-devtools — Sync

Periodic Sync: test-tag-from-devtools — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#2	Install	
#2	Wait	
#2	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

[script.js] Service Worker registered — app.js:6

>



```
self.addEventListener("activate", (event) => {

  console.log("%c[sw.js] Service Worker activated", "color: #FEC233");
  // ensure that the Service Worker is activated correctly (fail-safe)
  return self.clients.claim();
});
```




```
self.addEventListener("activate", (event) => {
  event.waitUntil(
    // will return an array of cache names
    caches.keys().then((keys) => {
      return Promise.all(
        // go over all available keys
        keys.map((key) => {
          if (key !== STATIC_CACHE && key !== DYNAMIC_CACHE) {
            console.log("%c[sw.js] Deleting old caches", "color: #FEC233");
            return caches.delete(key);
          }
        })
      );
    })
  );
  console.log("%c[sw.js] Service Worker activated", "color: #FEC233");
  // ensure that the Service Worker is activated correctly (fail-safe)
  return self.clients.claim();
});
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does

Network | Console | Application | Performance insights | Sources | Elements | Recorder

Application
- Manifest
- Service Workers
- Storage

Storage
- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - static-v1 - http://localhost:1993
  - static-v2 - http://localhost:1993
- Back/forward cache

Background Services
- Background Fetch

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 16:29:59

Status: #4 activated and is running stop

Clients: http://localhost:1993/ focus

Push: Test push message from DevTools. — Push

Sync: test-tag-from-devtools — Sync

Periodic Sync: test-tag-from-devtools — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#4	Install	
#4	Wait	
#4	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

[script.js] Service Worker registered — app.js:6

>


PREFETCH

Prefetch

Prefetching is when content is downloaded in the background, this is based on the assumption that the content will likely be requested, enabling the content to load instantly if and when the user requests it.

The content is downloaded and cached for anticipated future use without the user making an explicit request for it.

https://developer.mozilla.org/en-US/docs/Glossary/Prefetch



/index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.ico" />
    <script src="assets/js/app.js"></script>

  </head>
  <body>

    ...

  </body>
</html>
```

/index.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.ico" />
    <script src="assets/js/app.js"></script>
    <link rel="prefetch" href="jurassic-park-1993.html"/>
  </head>
  <body>

  ...

  </body>
</html>
```

/app.js



```
const addPrefetchLink = (url) => {
  link = document.createElement("link");
  link.rel = "prefetch";
  link.href = url;
  document.head.appendChild(link);
};
```






```
const addPrefetchLink = (url) => {
  link = document.createElement("link");
  link.rel = "prefetch";
  link.href = url;
  document.head.appendChild(link);
};


const linkList = document.querySelectorAll("a");
if (linkList) {
  linkList.forEach((link) => {
    addPrefetchLink(link);
  });
}
```




Jurassic Park

localhost:1993

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does

Network Console Application Performance insights Sources Elements Recorder

```
<!DOCTYPE html>
<html lang="en">
▼<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Jurassic Park</title>
  <link rel="stylesheet" href="assets/css/style.css">
  <link rel="icon" type="image/png" sizes="32x32" href="favicon.png">
  <script src="assets/js/app.js"></script>
  <link rel="prefetch" href="http://localhost:1993/jurassic-park-1993.html">
  <link rel="prefetch" href="http://localhost:1993/jurassic-park-1997.html">
  <link rel="prefetch" href="http://localhost:1993/jurassic-park-2001.html">
  <link rel="prefetch" href="http://localhost:1993/jurassic-world-2015.html">
  <link rel="prefetch" href="http://localhost:1993/jurassic-world-2018.html">
  <link rel="prefetch" href="http://localhost:1993/jurassic-world-2022.html">
</head>
▼<body>
  ▼<main>
    <h1>Jurassic Park</h1>
    <img src="assets/img/jurassic-park.jpg" alt>
    <h2>Welcome to... Jurassic Park!</h2>
   ▶<p>…</p>
   ▶<p>…</p>
   ▶<ol>…</ol>
  </main>
</body>
…</html> == $0
```

html

Styles Computed Layout

Filter :hov .cls

```
element.style {
}
:root {                                   style.css:8
  --primary: rgb(250, 250, 250);
  --secondary: rgb(255, 27, 2);
  --tertiary: rgb(254, 246, 6);
  --dark: rgb(34, 34, 35);
  --light: rgb(220, 220, 220);
}
html {                                    style.css:16
  background-color: var(--dark);
  font-family: Arial, Helvetica,
       sans-serif;
  font-size: 1.5rem;
  color: var(--light);
}
html[Attributes Style] {
  -webkit-locale: "en";
}
html {                          user agent stylesheet
  display: block;
}
```

margin -
border -
padding -

Console What's New Issues

top Filter Default levels No Issues

[script.js] Service Worker registered app.js:6

Resource Hints: prefetch - WD

Usage % of all users ?

Global 78.25%

Informs the browsers that a given resource should be prefetched so it can be loaded more quickly. This is indicated using `<link rel="prefetch" href="(url)">`

Current aligned | Usage relative | Date relative | Filtered | All

IE	Edge *	Firefox	Chrome	Safari	Opera	Safari on iOS *	Opera Mini *	Android Browser *	Opera Mobile *	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	QQ Browser	Baidu Browser	KaiOS Browser
								2.1-3								
								4								
			4-7	3.1-13	10-12.	3.2-13.3		4.1-4.3								
6-10	12-102	2-101	8-102	[1] 13.1-15.4	15-85	[1] 13.4-15.4		4.4-4.4.4	12-12.1				4-16.0			
11	103	102	103	[1] 15.5	86	[1] 15.5	all	103	64	103	101	12.12	17.0	10.4	7.12	2.5
		103-104	104-106	[1] 16.0-TP	87	[1] 16.0										

Notes | Test on a real browser | Known issues (0) | Resources (3) | Feedback

[1] Can be enabled in Safari as `LinkPrefetch` in the developer menu


OPTIMISED PREFETCH
https://github.com/rowdyrabouw/offline-first.nl/tree/08-optimised-prefetch

/app.js



```
// get all links on the page
const linkList = document.querySelectorAll("a");
if (linkList) {
  linkList.forEach((link) => {
    fetch(entry.target.href, { cache: "no-store" })
  });
}
```

data-*

The data-* global attributes form a class of attributes called custom data attributes, that allow proprietary information to be exchanged between the HTML and its DOM representation by scripts.

*https://developer.mozilla.org/en-US/docs/Web/HTML/Global_attributes/data-**



/*.html



```
<a data-skip-prefetch href="...">...</a>
```




/app.js



```
// get all links on the page without data-skip-prefetch attribute
const linkList = document.querySelectorAll("a:not([data-skip-prefetch])");
if (linkList) {
  linkList.forEach((link) => {
    fetch(entry.target.href, { cache: "no-store" })
  });
}
```

Intersection Observer API

The Intersection Observer API provides a way to asynchronously observe changes in the intersection of a target element with an ancestor element or with a top-level document's viewport.

https://developer.mozilla.org/en-US/docs/Web/API/Intersection_Observer_API



/app.js

```
const observer = new IntersectionObserver(
  (entries) => {
    entries.forEach((entry) => {
      // if the link is in the viewport
      if (entry.intersectionRatio === 1) {


          fetch(entry.target.href, { cache: "no-store" });



      }
    });
  },
  { threshold: 1 }
);
```

/app.js

```
const observer = new IntersectionObserver(
  (entries) => {
    entries.forEach((entry) => {
      // if the link is in the viewport
      if (entry.intersectionRatio === 1) {



          fetch(entry.target.href, { cache: "no-store" });




      }
    });
  },
  { threshold: 1 }
);

// get all links on the page without data-skip-prefetch attribute
const linkList = document.querySelectorAll("a:not([data-skip-prefetch])");
if (linkList) {
  linkList.forEach((link) => {
    observer.observe(link);
  });
}
```

/app.js

```
const observer = new IntersectionObserver(
  (entries) => {
    entries.forEach((entry) => {
      // if the link is in the viewport
      if (entry.intersectionRatio === 1) {
        const isFetched = localStorage.getItem(entry.target.href);
        // if the link is not fetched yet
        if (!isFetched) {
          fetch(entry.target.href, { cache: "no-store" }).then(() => {
            // save link information
            localStorage.setItem(entry.target.href, entry.target.innerText);
          });
        }
      }
    });
  },
  { threshold: 1 }
);

// get all links on the page without data-skip-prefetch attribute
const linkList = document.querySelectorAll("a:not([data-skip-prefetch])");
if (linkList) {
  linkList.forEach((link) => {
    observer.observe(link);
  });
}
```

/sw.js



```
const STATIC_CACHE = "static-v2";
```




/sw.js

```
const STATIC_CACHE = "static-v3";
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does

Network | Console | Application | Performance insights | Sources | Elements | Recorder | »

Application
- Manifest
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Storage
- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - static-v2 - http://localhost:1993
  - dynamic-v1 - http://localhost:1
- Back/forward cache

Background Services
- Background Fetch
- Background Sync

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 17:26:45

Status: #5 activated and is running stop

Push: `Test push message from DevTools.` — Push

Sync: `test-tag-from-devtools` — Sync

Periodic Sync: `test-tag-from-devtools` — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#5	Install	
#5	Wait	
#5	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

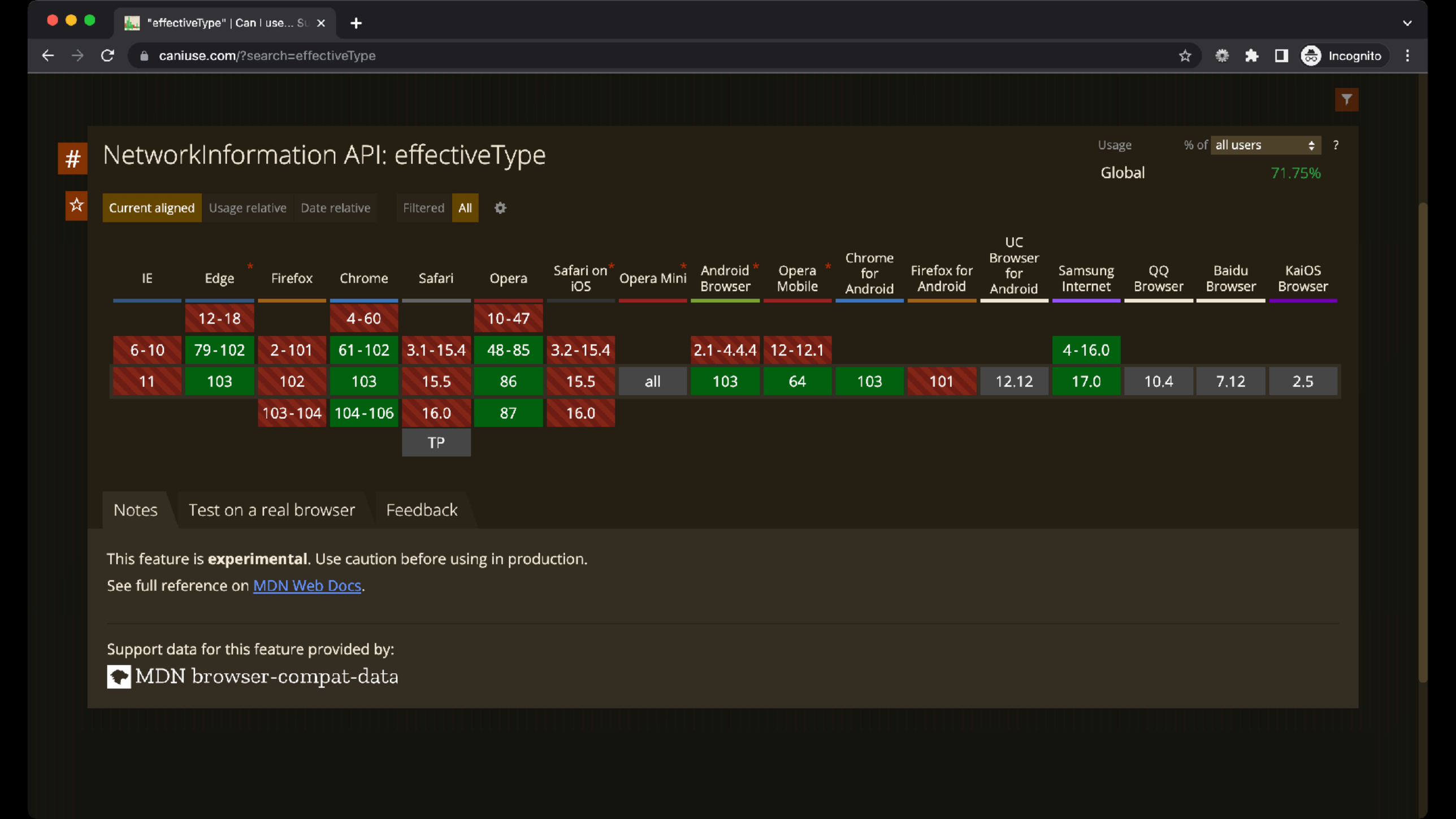
```
[script.js] Service Worker registered                app.js:6
>
```

NetworkInformation.effectiveType

The effectiveType read-only property returns the effective type of the connection meaning one of 'slow-2g', '2g', '3g', or '4g'.



https://developer.mozilla.org/en-US/docs/Web/API/NetworkInformation/effectiveType

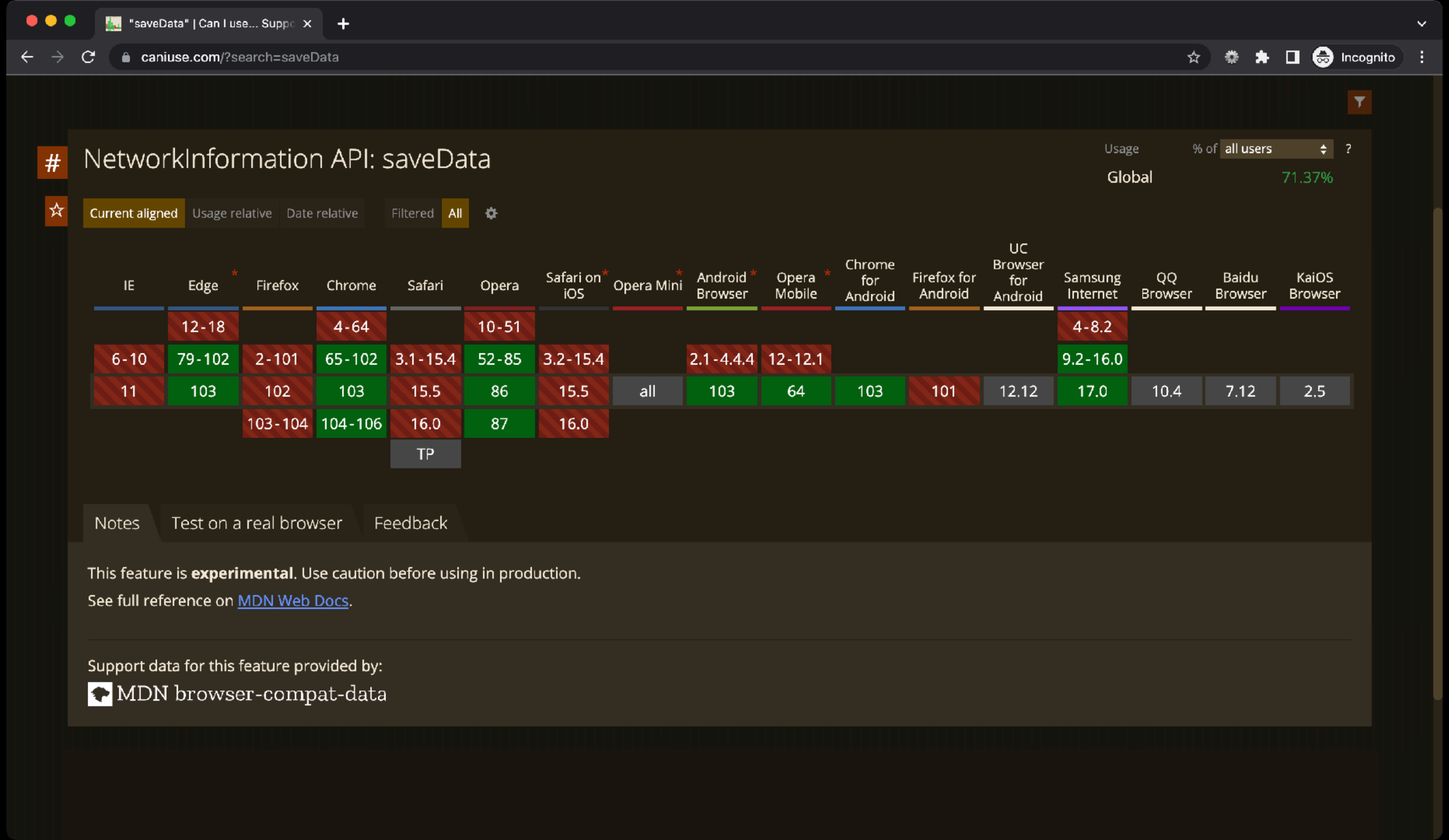

"effectiveType" | Can I use...
caniuse.com/?search=effectiveType
Incognito
NetworkInformation API: effectiveType
Usage
% of all users
Global
71.75%
Current aligned
Usage relative
Date relative
Filtered
All
IE
Edge
Firefox
Chrome
Safari
Opera
Safari on iOS
Opera Mini
Android Browser
Opera Mobile
Chrome for Android
Firefox for Android
UC Browser for Android
Samsung Internet
QQ Browser
Baidu Browser
KaiOS Browser
12-18
4-60
10-47
6-10
79-102
2-101
61-102
3.1-15.4
48-85
3.2-15.4
2.1-4.4.4
12-12.1
4-16.0
11
103
102
103
15.5
86
15.5
all
103
64
103
101
12.12
17.0
10.4
7.12
2.5
103-104
104-106
16.0
87
16.0
TP
Notes
Test on a real browser
Feedback
This feature is experimental. Use caution before using in production.
See full reference on MDN Web Docs.
Support data for this feature provided by:
MDN browser-compat-data

NetworkInformation.saveData

The saveData read-only property returns true if the user has set a reduced data usage option on the user agent.



https://developer.mozilla.org/en-US/docs/Web/API/NetworkInformation/effectiveType


"saveData" | Can I use... Suppo
caniuse.com/?search=saveData
Incognito
NetworkInformation API: saveData
Usage
% of all users
Global
71.37%
Current aligned
Usage relative
Date relative
Filtered
All
IE
Edge *
Firefox
Chrome
Safari
Opera
Safari on iOS *
Opera Mini *
Android Browser *
Opera Mobile *
Chrome for Android
Firefox for Android
UC Browser for Android
Samsung Internet
QQ Browser
Baidu Browser
KaiOS Browser
12-18
4-64
10-51
4-8.2
6-10
79-102
2-101
65-102
3.1-15.4
52-85
3.2-15.4
2.1-4.4.4
12-12.1
9.2-16.0
11
103
102
103
15.5
86
15.5
all
103
64
103
101
12.12
17.0
10.4
7.12
2.5
103-104
104-106
16.0
87
16.0
TP
Notes
Test on a real browser
Feedback
This feature is experimental. Use caution before using in production.
See full reference on MDN Web Docs.
Support data for this feature provided by:
MDN browser-compat-data


OPTIMISED OFFLINE
https://github.com/rowdyrabouw/offline-first.nl/tree/09-optimised-offline

/offline.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park - offline</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.ico" />
    <script defer src="assets/js/app.js"></script>
  </head>
  <body>
    <main>
      <h1>Jurassic Park is closed</h1>
      <img src="assets/img/jurassic-park.jpg" alt="" />
      <h2>It seems you are currently offline ...</h2>
      <p><strong>We're sorry, this page hasn't been cached yet :-(</strong></p>
      <p>But why don't you try one of our <a href="/">other pages</a>?</p>



    </main>
  </body>
</html>
```




/offline.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Jurassic Park - offline</title>
    <link rel="stylesheet" href="assets/css/style.css" />
    <link rel="icon" type="image/png" sizes="32x32" href="favicon.ico" />
    <script defer src="assets/js/offline.js"></script>
  </head>
  <body>
    <main>
      <h1>Jurassic Park is closed</h1>
      <img src="assets/img/jurassic-park.jpg" alt="" />
      <h2>It seems you are currently offline ...</h2>
      <p><strong>We're sorry, this page hasn't been cached yet :-(</strong></p>
      <p>These pages are available offline:</p>
      <ul id="localStorageItems">
        <li><a href="/">Homepage</a></li>
      </ul>
    </main>
  </body>
</html>
```

/sw.js



```
const STATIC_CACHE = "static-v3";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.ico",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
  "offline.html",

];
```

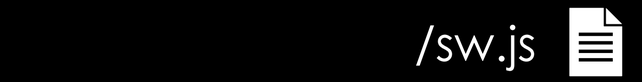





```
const STATIC_CACHE = "static-v4";
const STATIC_FILES = [
  "/",
  "index.html",
  "/favicon.ico",
  "assets/css/style.css",
  "assets/fonts/neuland_inline.woff2",
  "assets/img/jurassic-park.jpg",
  "assets/js/app.js",
  "offline.html",
  "assets/js/offline.js",
];
```




/sw.js

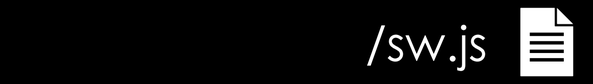


```
self.addEventListener("fetch", (event) => {

  event.respondWith(
    // look at all caches for a match on the key (= request)
    ...
  );
});
```




/sw.js



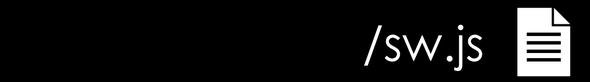
```
let setDynamicVersionInLocalStorage = true;

self.addEventListener("fetch", (event) => {

  event.respondWith(
    // look at all caches for a match on the key (= request)
    ...
  );
});
```




/sw.js



```
let setDynamicVersionInLocalStorage = true;

self.addEventListener("fetch", (event) => {
 if (setDynamicVersionInLocalStorage) {
    event.waitUntil(
      (async () => {
        // get the client
        const client = await clients.get(event.clientId);
        // send a message to the client
        client.postMessage({
          action: "setDynamicVersionInLocalStorage",
          dynamic: DYNAMIC_CACHE,
        });
        setDynamicVersionInLocalStorage = false;
      })()
    );
  }
  event.respondWith(
    // look at all caches for a match on the key (= request)
    ...

  );
});
```




/app.js



```
// listen for messages from the Service Worker
navigator.serviceWorker.addEventListener("message", (event) ⇒ {
  if (event.data.action === "setDynamicVersionInLocalStorage") {
    console.log(
      `%c[app.js] Dynamic Cache version ${event.data.dynamic} set`,
      "color: #00ABD2"
    );
    localStorage.setItem("DYNAMIC_CACHE", event.data.dynamic);
  }
});
```




/offline.js

```
const retrieveCachedUrls = () => {
  const dynamicCacheVersion = localStorage.getItem("DYNAMIC_CACHE");
  const urls = [];
  caches.open(dynamicCacheVersion).then((cache) => {
    cache
      .keys()
      .then((keys) => {
        // retrieve all items from dynamic cache
        return Promise.all(
          keys.map((key) => {
            // only return pages, but ignore offline page
            if (key.url.endsWith(".html") && !key.url.includes("offline")) {
              urls.push(key.url);
              return key.url;
            }
          })
        );
      })
      .then(() => {
        cacheList(urls);
      });
  });
};
```

```
const cacheList = (urls) ⇒ {
  urls.forEach((url) ⇒ {
    // create a list item with link to cached page
    const listItem = document.createElement("li");
    const anchor = document.createElement("a");
    listItem.appendChild(anchor);
    // match the url with localStorage to retrieve text
    const text = localStorage[url] || url;
    const link = document.createTextNode(text);
    anchor.appendChild(link);
    anchor.href = url;
    // add link to offline page
    const element = document.getElementById("localStorageItems");
    element.appendChild(listItem);
  });
};

retrieveCachedUrls();
```

Jurassic Park

localhost:1993

Incognito

JURASSIC PARK



WELCOME TO... JURASSIC PARK!

Humans waited 65 million years for cloning technology to be advanced enough to re-create dinosaurs from DNA found in mosquitoes preserved in amber. If that's the timeline, the 29 years between Jurassic Park, the first film in the franchise, and the latest Jurassic World: Dominion doesn't seem all that long. But spreading six movies out across three decades does

Network | Console | Application | Performance insights | Sources | Elements | Recorder | »

Application
- Manifest
- Service Workers
- Storage

Storage
- Local Storage
  - http://localhost:1993
- Session Storage
- IndexedDB
- Web SQL
- Cookies
- Trust Tokens
- Interest Groups

Cache
- Cache Storage
  - dynamic-v1 - http://localhost:1
  - static-v3 - http://localhost:1993
- Back/forward cache

Background Services
- Background Fetch

Service Workers

Offline | Update on reload | Bypass for network

http://localhost:1993/ — Network requests | Update | Unregister

Source: sw.js

Received 04/07/2022, 17:29:48

Status: #6 activated and is running stop

Push: Test push message from DevTools. — Push

Sync: test-tag-from-devtools — Sync

Periodic Sync: test-tag-from-devtools — Periodic Sync

Update Cycle

Version	Update Activity	Timeline
#6	Install	
#6	Wait	
#6	Activate	

Console | What's New | Issues

top | Filter | Default levels | No Issues

```
[app.js] Observing links without data-skip-prefetch attribute   app.js:60
[script.js] Service Worker registered                           app.js:6
>
```


TACK SÅ MYCKET !
https://rowdy.codes/jfokus