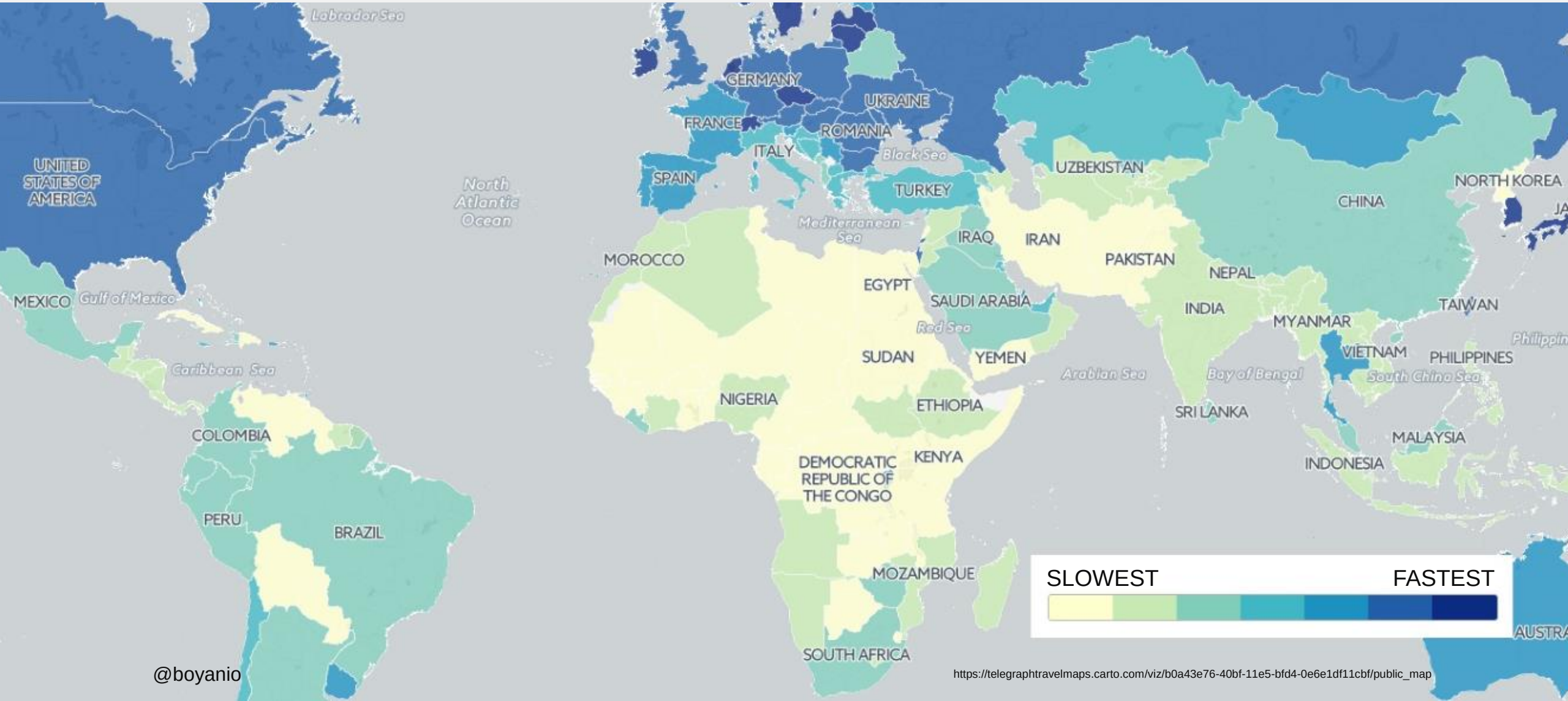
Better offline experience

Boyan Mihaylov
@boyanio

Internet speed worldwide



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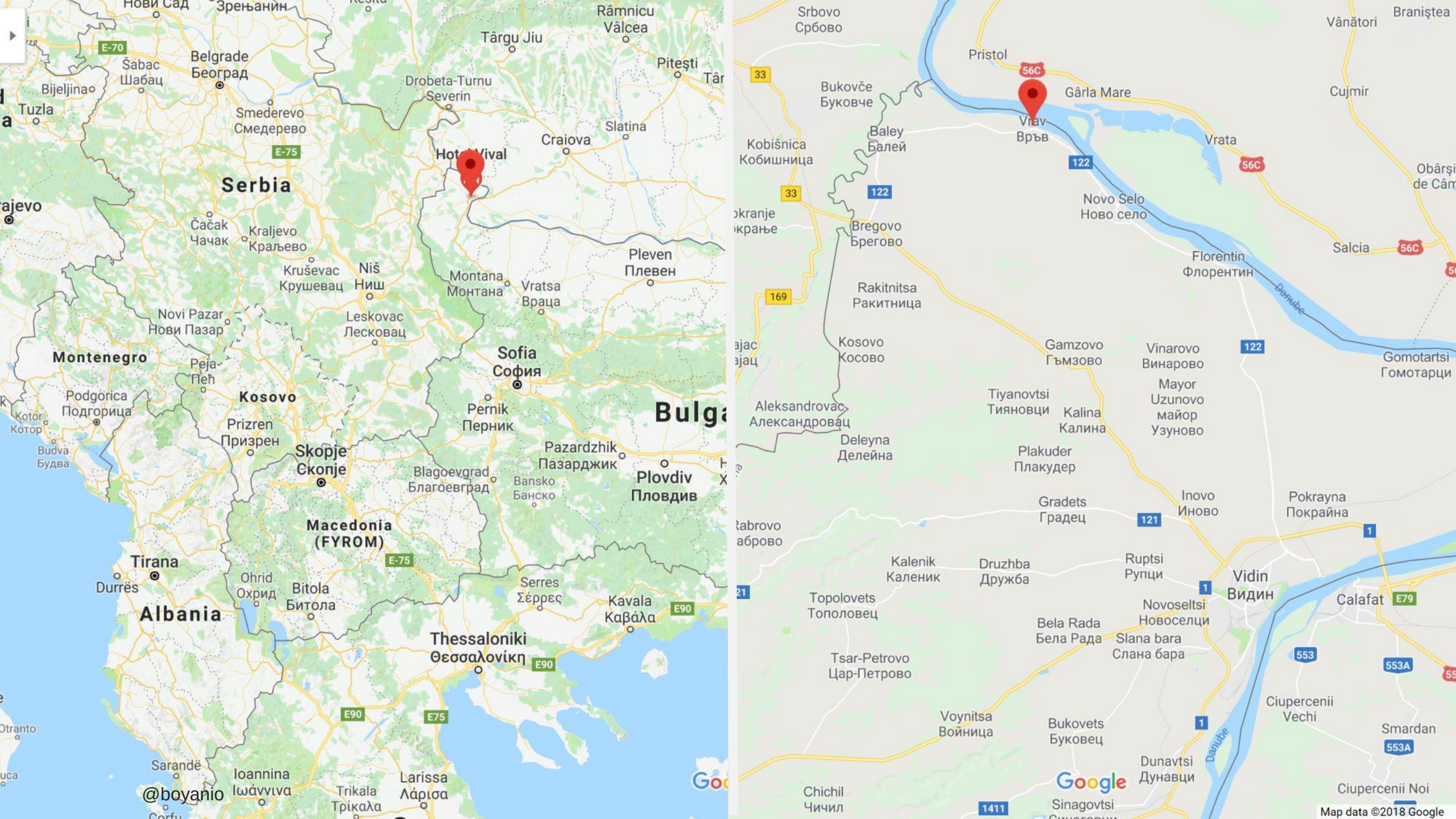
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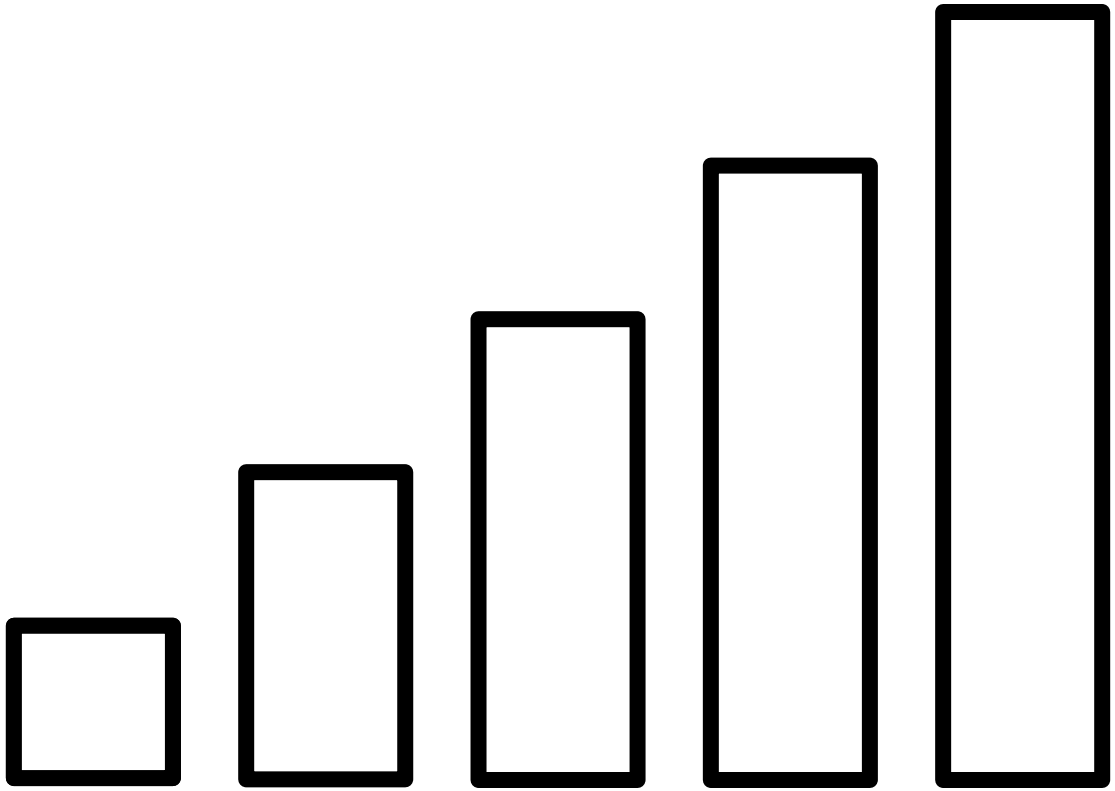

Working while travelling

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Working while travelling

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Report

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eLearning, being the latest wave of education, is already having a fair show despite posing challenges for both instructors and students. While instructors need to put in intensive work and time to design the instruction, students need to equip themselves with technical proficiency to decode the course material. There are 5 common problems faced by students in eLearning classes and which they need to be solved through proper initiatives for the students' future benefits:

Switching from traditional classroom and face to face instructor training to computer-based training in a virtual classroom makes the learning experience entirely different for students. Their resistance to change doesn't allow them to adapt to the online learning environment, whereas it takes time for them to get accustomed to Course Management Systems (CMS) and the methods of computer-based education. While passive listening and notes taking are expected in a traditional classroom, online discussions or creating a web page demand springing into action. Students with a "traditional" mindset find it difficult to adapt; however, they need to accept the new learning circumstances with an open mind and heart. Understanding the benefits of eLearning and even discussing them with their peers may change this mindset and better prepare students for online classes.

Many students are not provided with the high bandwidth or the strong internet connection that online courses require, and thus fail to catch up with their virtual classmates: Their weak monitors make it hard to follow the Course Management System and their learning experience becomes problematic. Moreover, most of them live off campus and find it difficult to keep in tune with the technical requirements of the chosen course. Some of them don't even own computers and seek help in Learning Resource Centers for technical assistance. The only solution to this problem is knowing exactly what kind of technological support they will need for a certain course before enrolling in it, as well as properly equipping themselves for the course's successful completion.

There is no Internet connection

Try:

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

ERR_INTERNET_DISCONNECTED

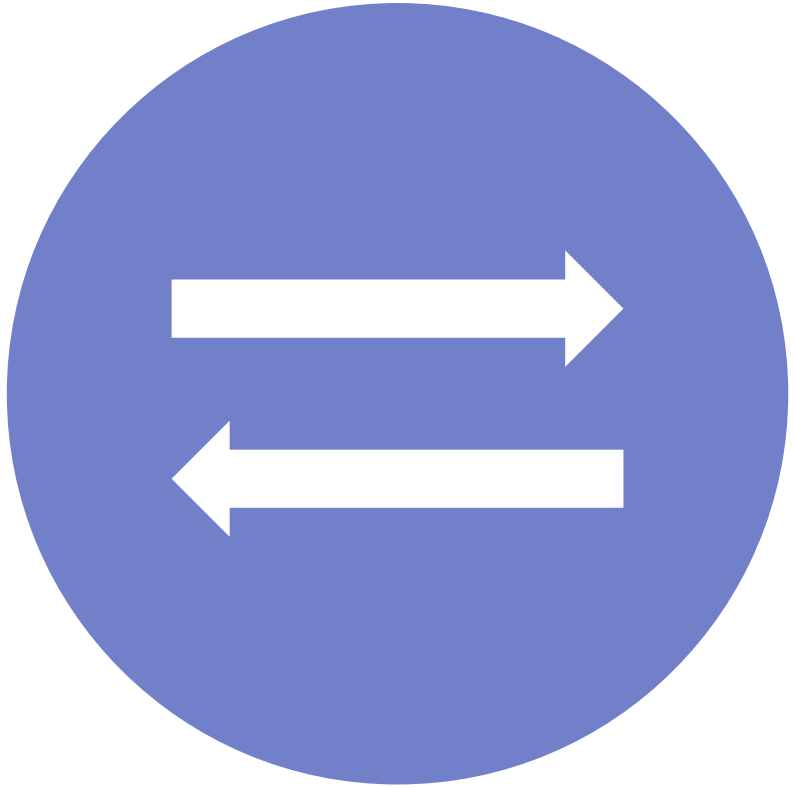
“

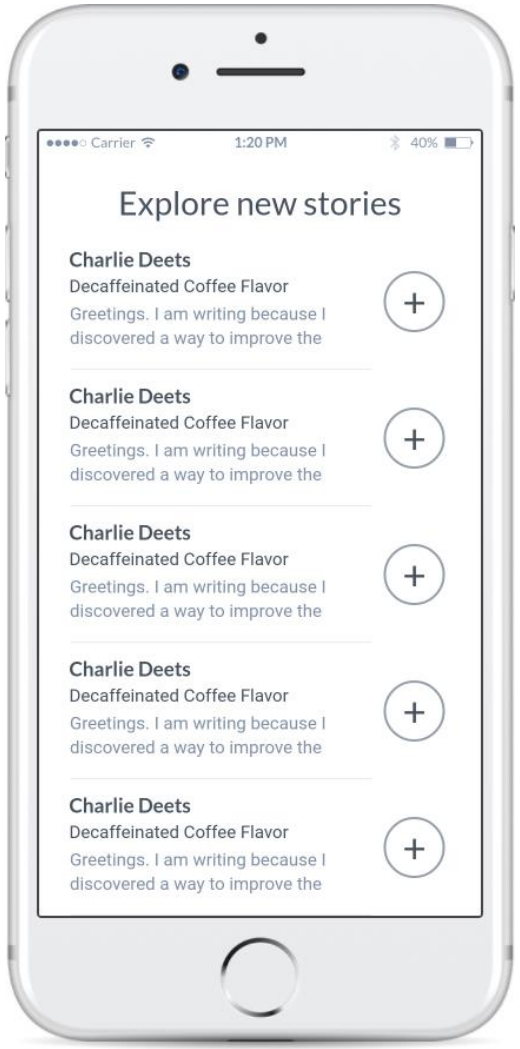
Design your app to work offline, and it'll work beautifully all the time.

Joanna Smith

”

Request-response revisited

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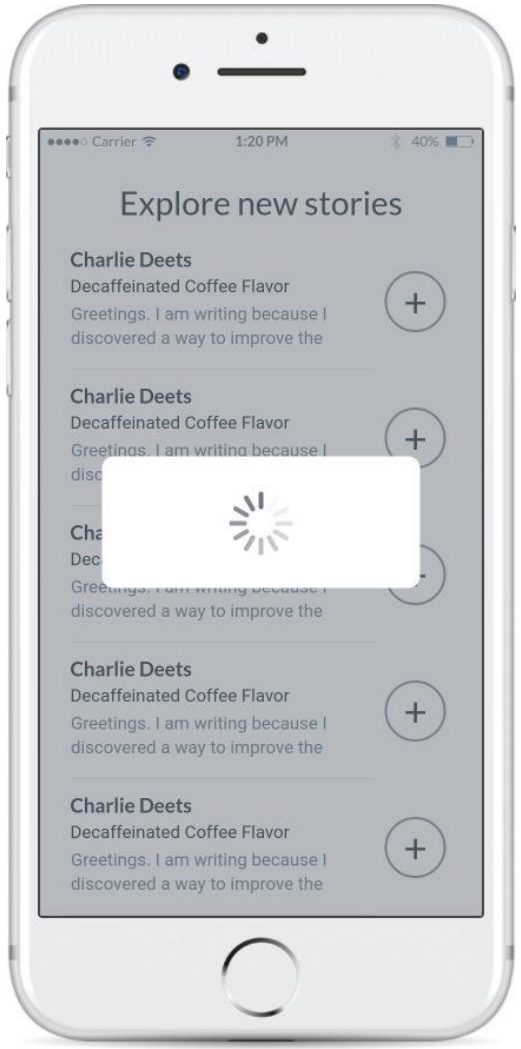
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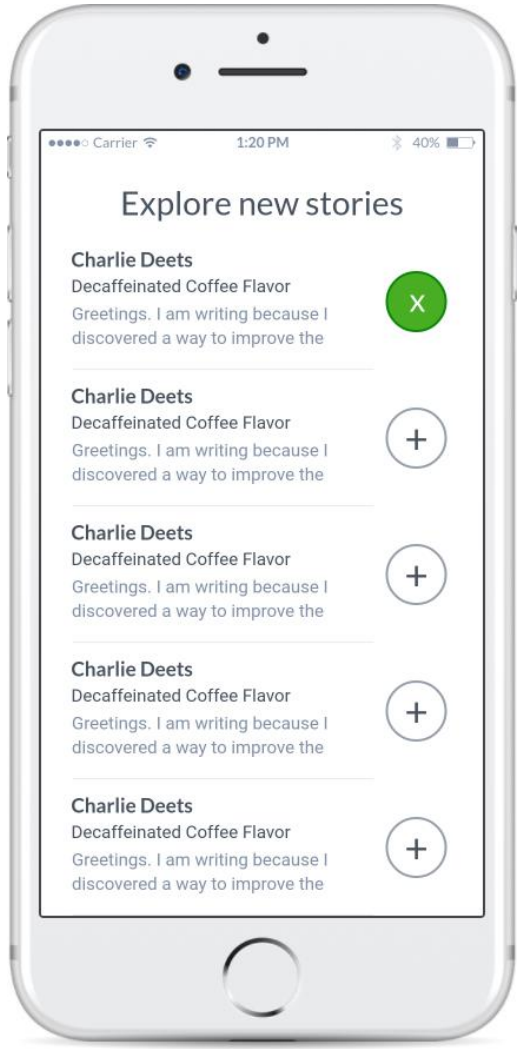
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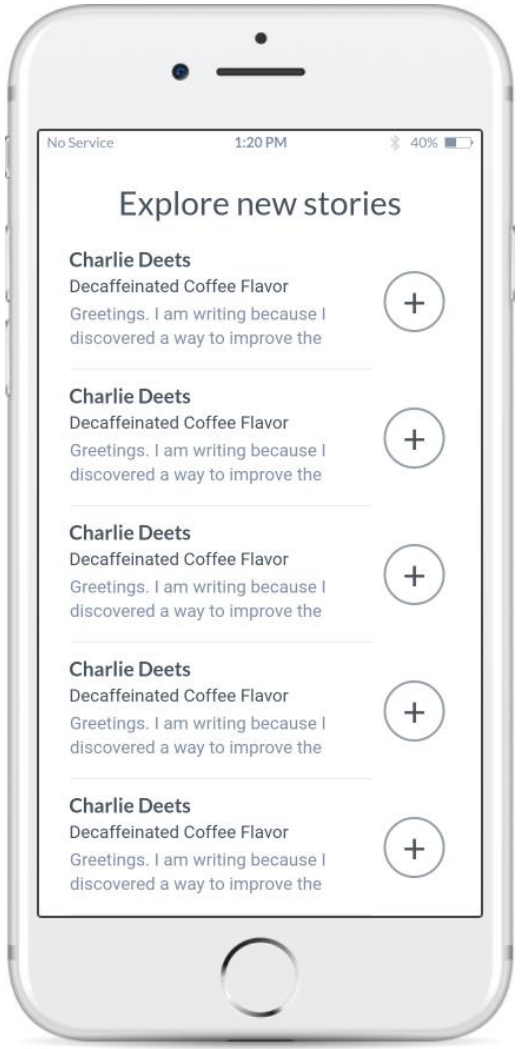
Request-response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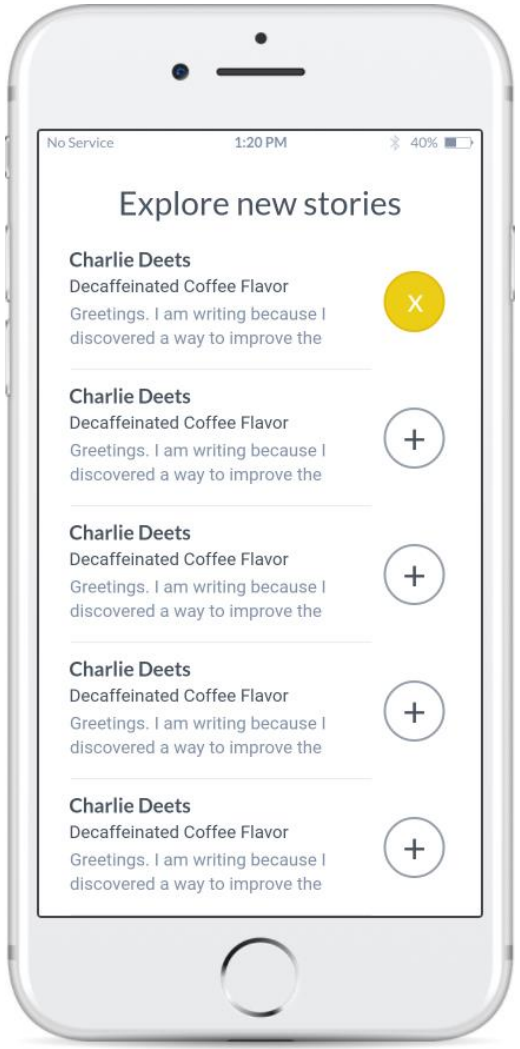
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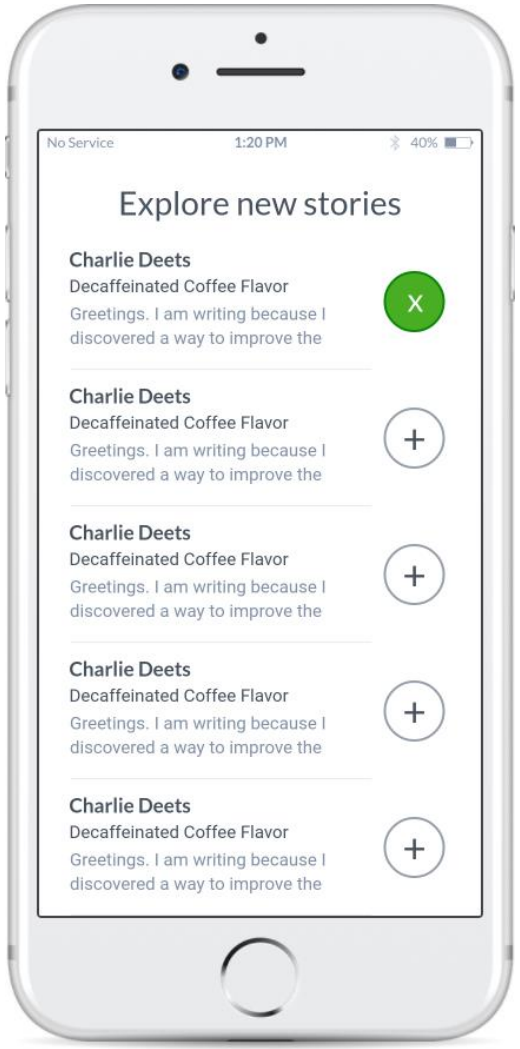
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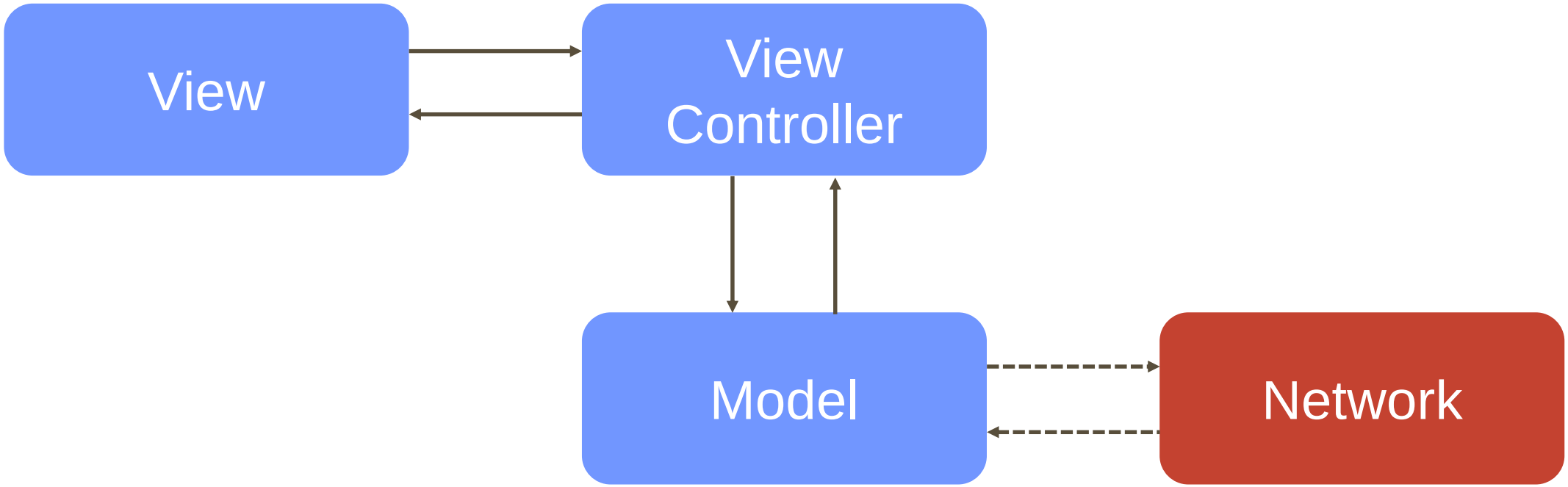
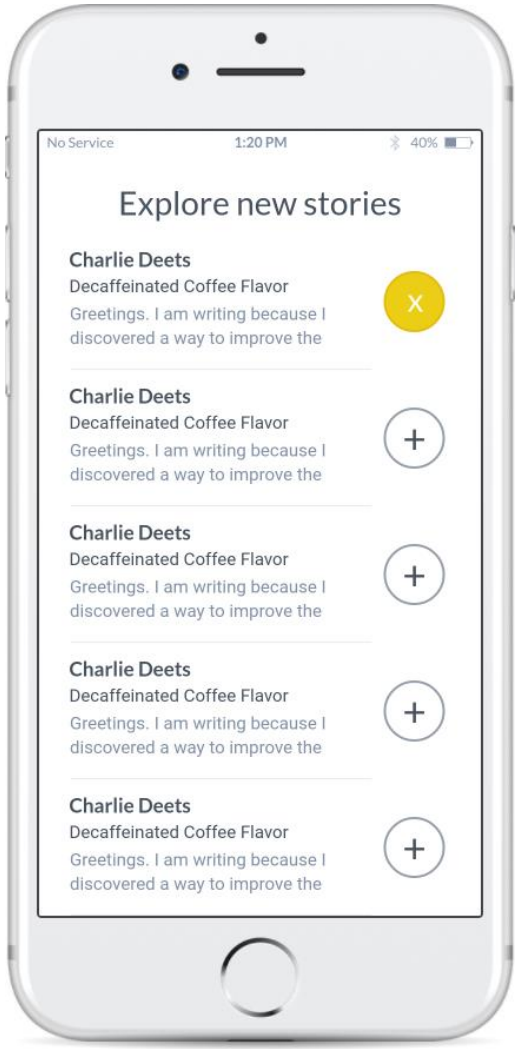
Apply locally, sync with network

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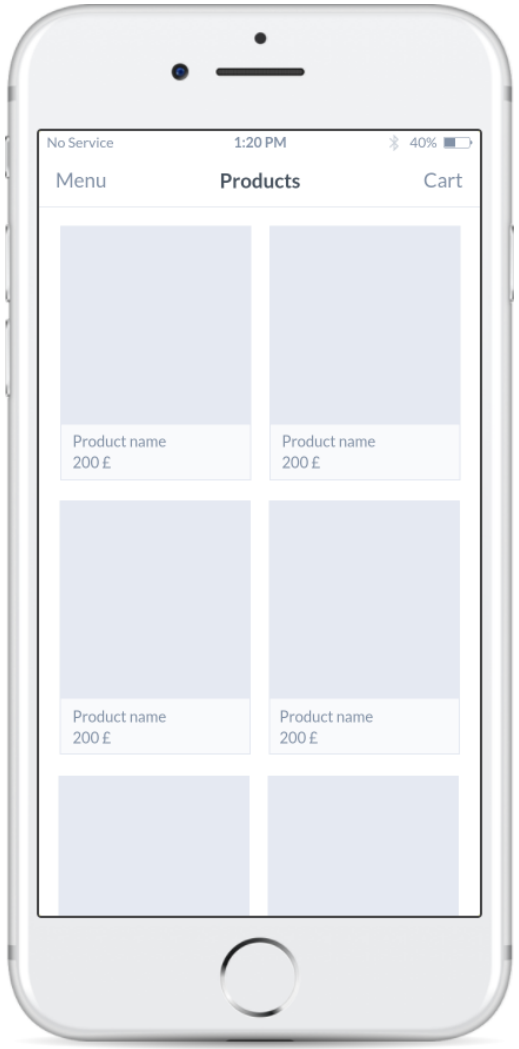
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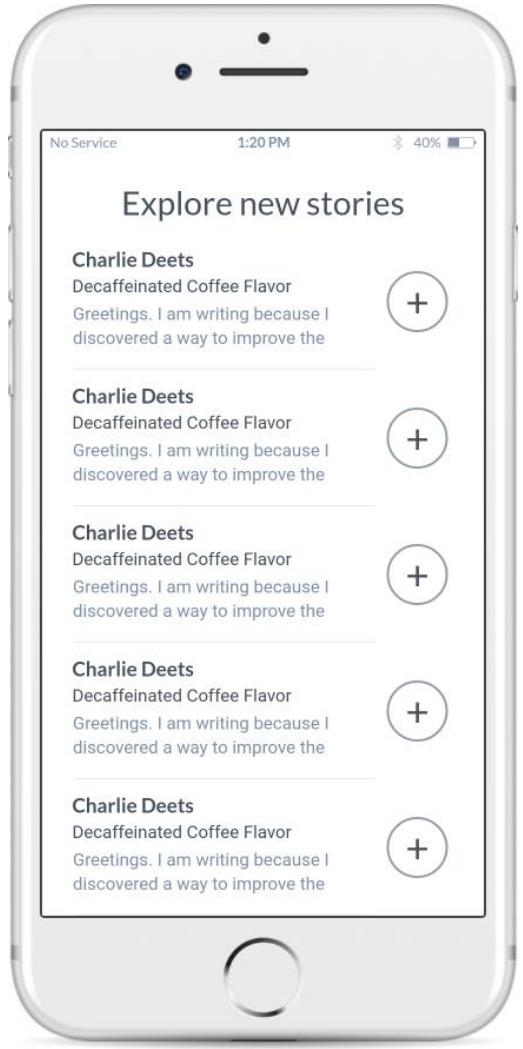
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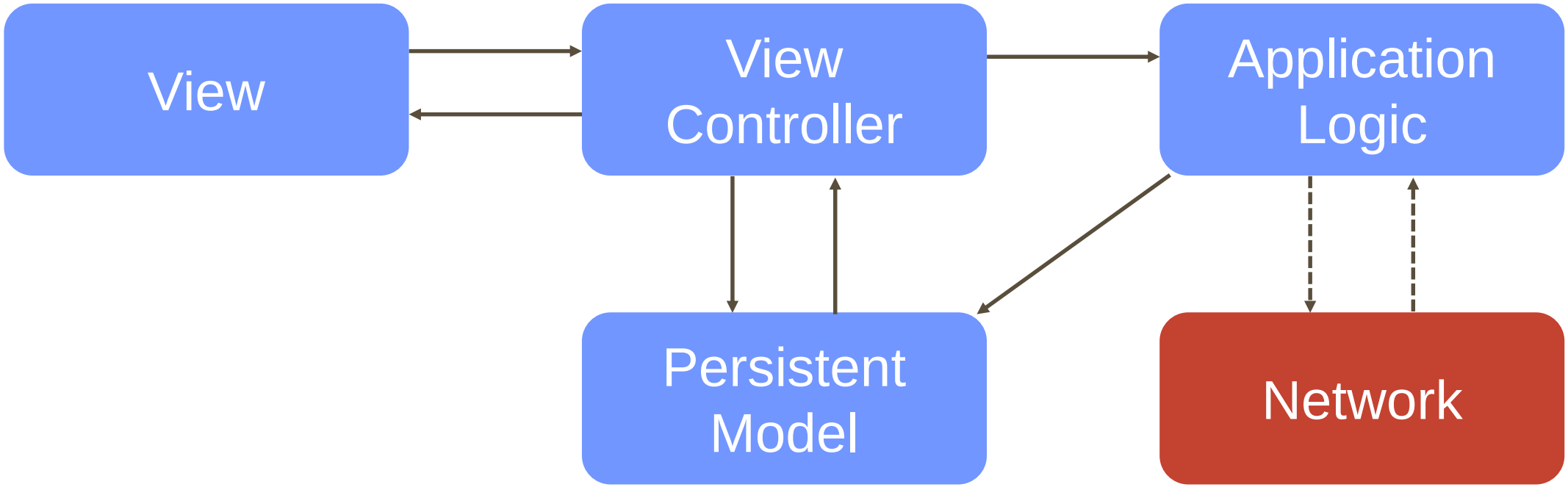
Persist model locally, sync with network



Network is your enemy,
disk is your friend.

Service Workers

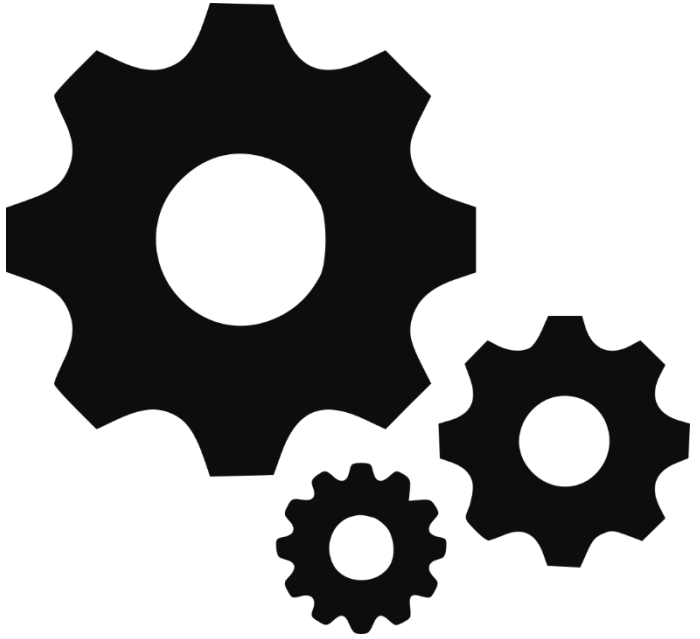
A script running in the background

- Even when the browser is closed

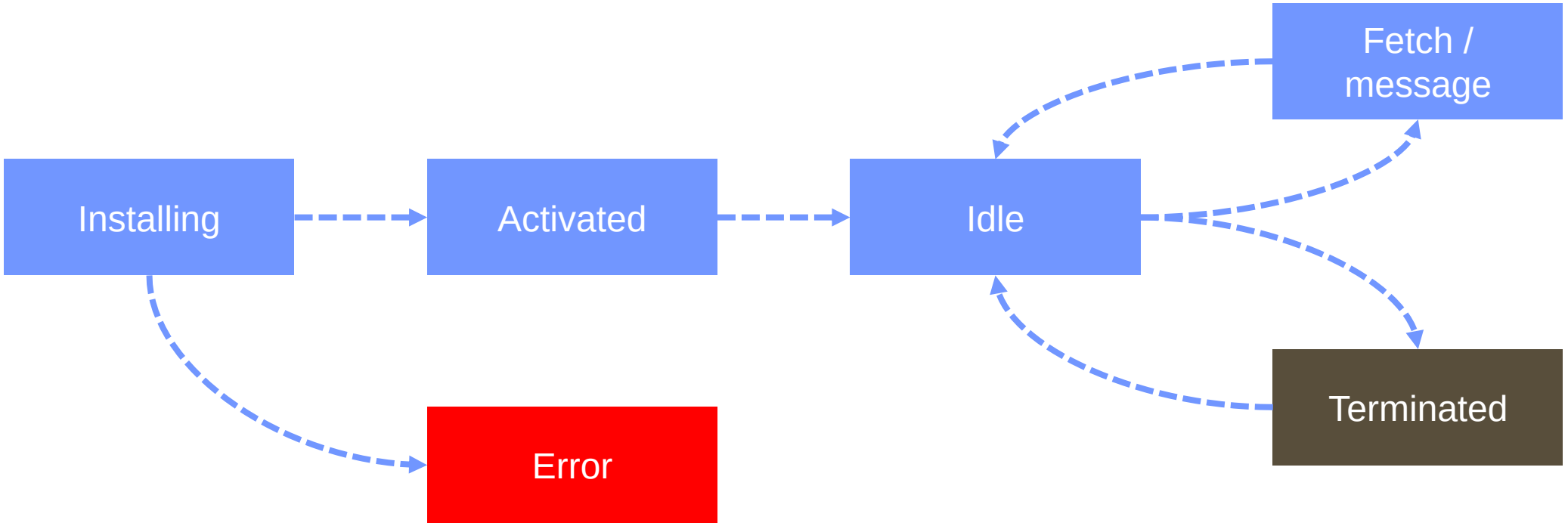
Acts as a proxy between the browser and the network (when available)

Programmatic and controllable

Cache API



Service Worker lifecycle



Service Worker – register

```
<script>
  if ("serviceWorker" in navigator) {
    navigator.serviceWorker.register("app-install.js")
      .then(function() {
        console.log("Service worker has been installed");
      }, function(error) {
        console.log("Oops!", error);
      });
  } else {
    console.log("No service workers support for this browser");
  }
</script>
```

Service Worker – install

app-install.js

```
const CACHE_NAME = "app.cache.v1";

this.addEventListener("install", (event) => {
  event.waitUntil(
    caches.open(CACHE_NAME).then((cache) => {
      return cache.addAll([
        "/index.html",
        "/css/style.css",
        "/js/app.js"
      ]);
    })
  );
});
```

…

Service Worker – fetch

app-install.js

```
…
this.addEventListener("fetch", (event) => {
  event.respondWith(
    caches.match(event.request).then((response) => {
      return response || fetch(event.request);
    });
  );
});
…
```

Service Worker specifics

HTTPS only

Asynchronous, promise-based

No access to DOM

Isn’t tied to a particular page

Could work even if the browser is closed

Caching strategies using service workers

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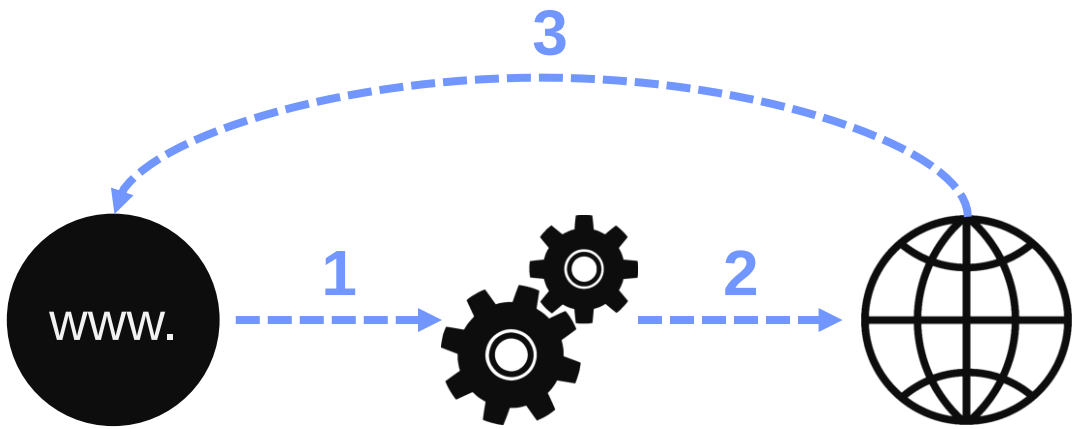
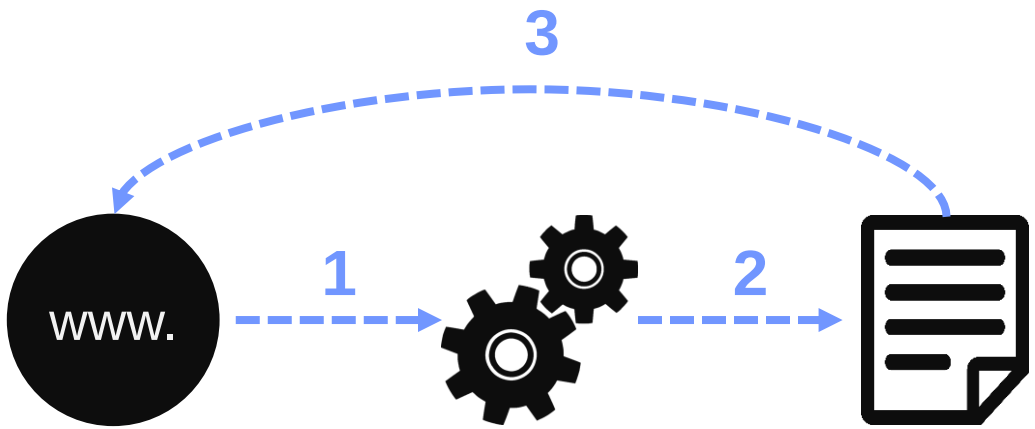
Network only



Scenarios

- Analytics requests
- Non-GET requests

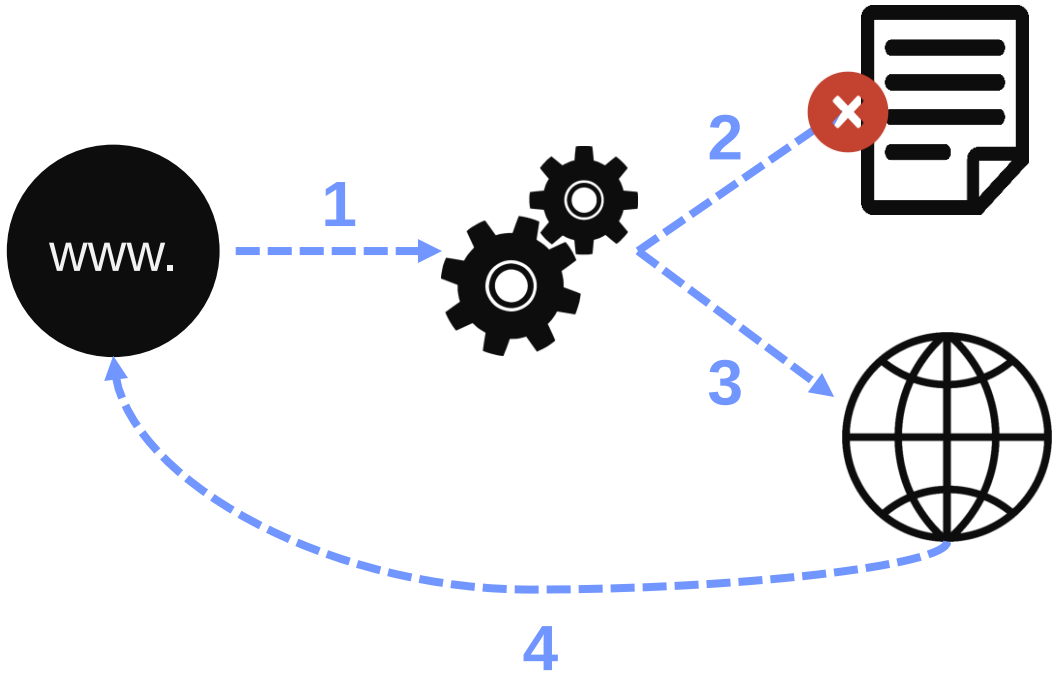
Cache only



Scenarios

- The static part of your app

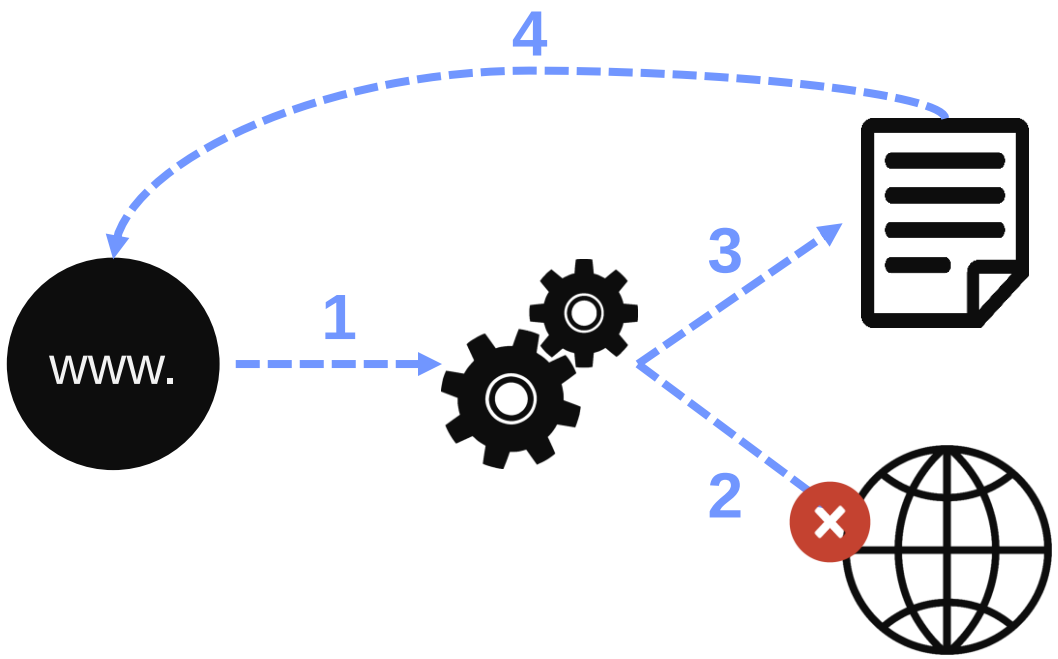
Cache, falling back to network



Scenarios

- The majority of requests when building offline-first app

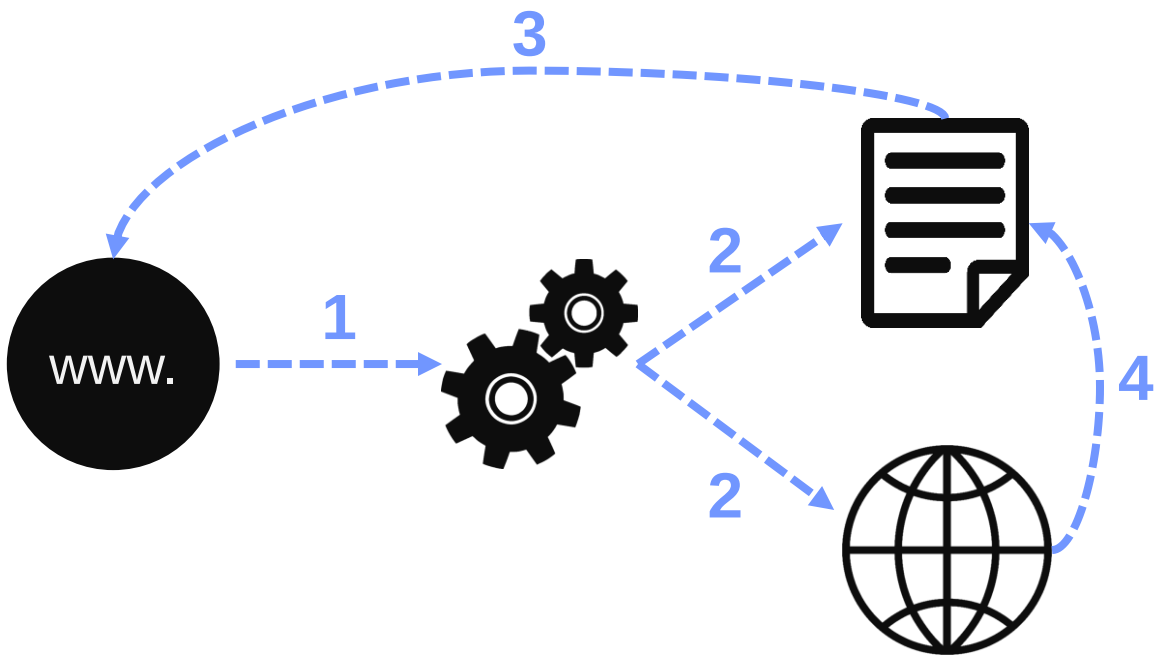
Network, falling back to cache



Scenarios

- Online users will always get the latest content
- Offline users will get older content

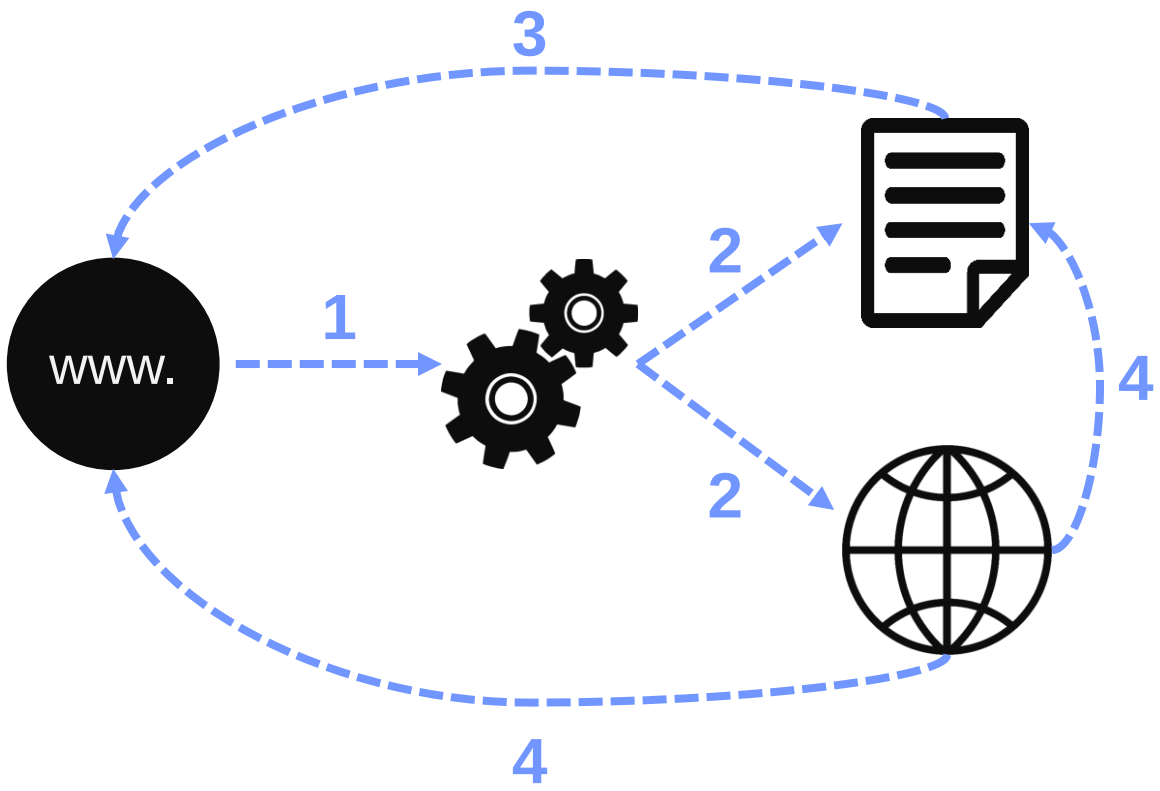
Cache & update



Scenarios

- You don’t mind showing old content for a while

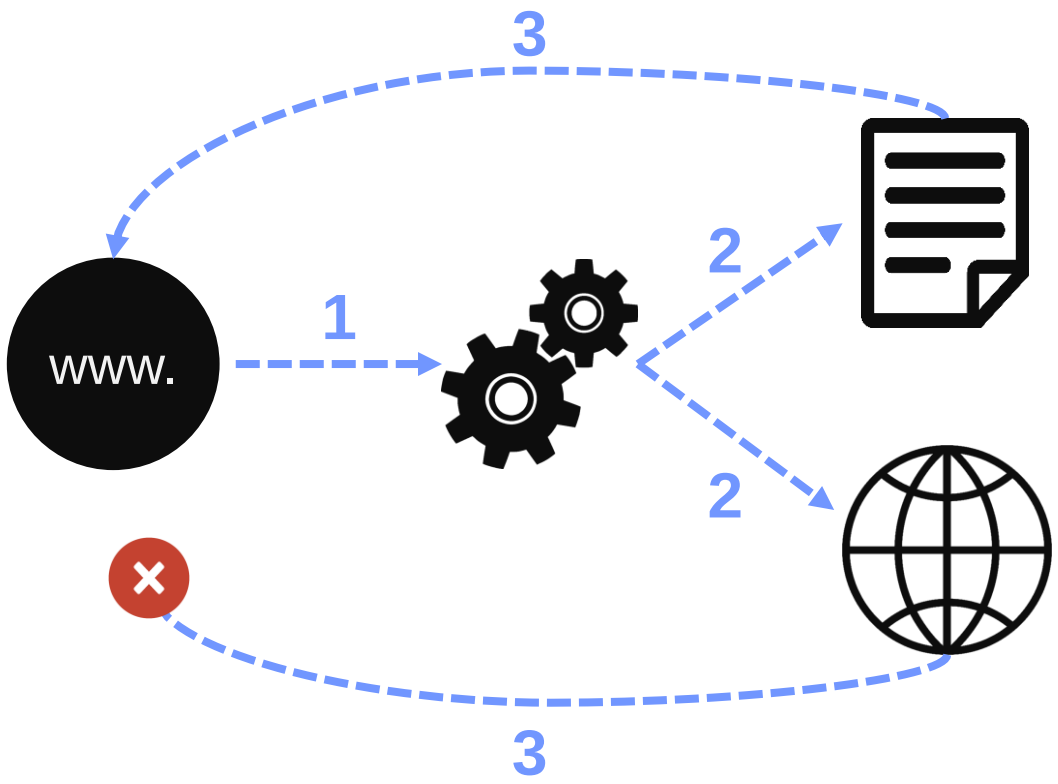
Cache, update, refresh



Scenarios

- Content that changes often (fx., game score, social media timeline)

Network & cache race



Scenarios

- Small “non-important” assets
- Where performance is vital

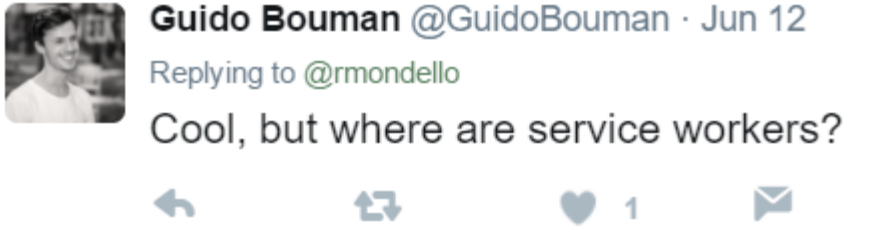
“

There are only two hard things in Computer Science: cache invalidation and naming things.

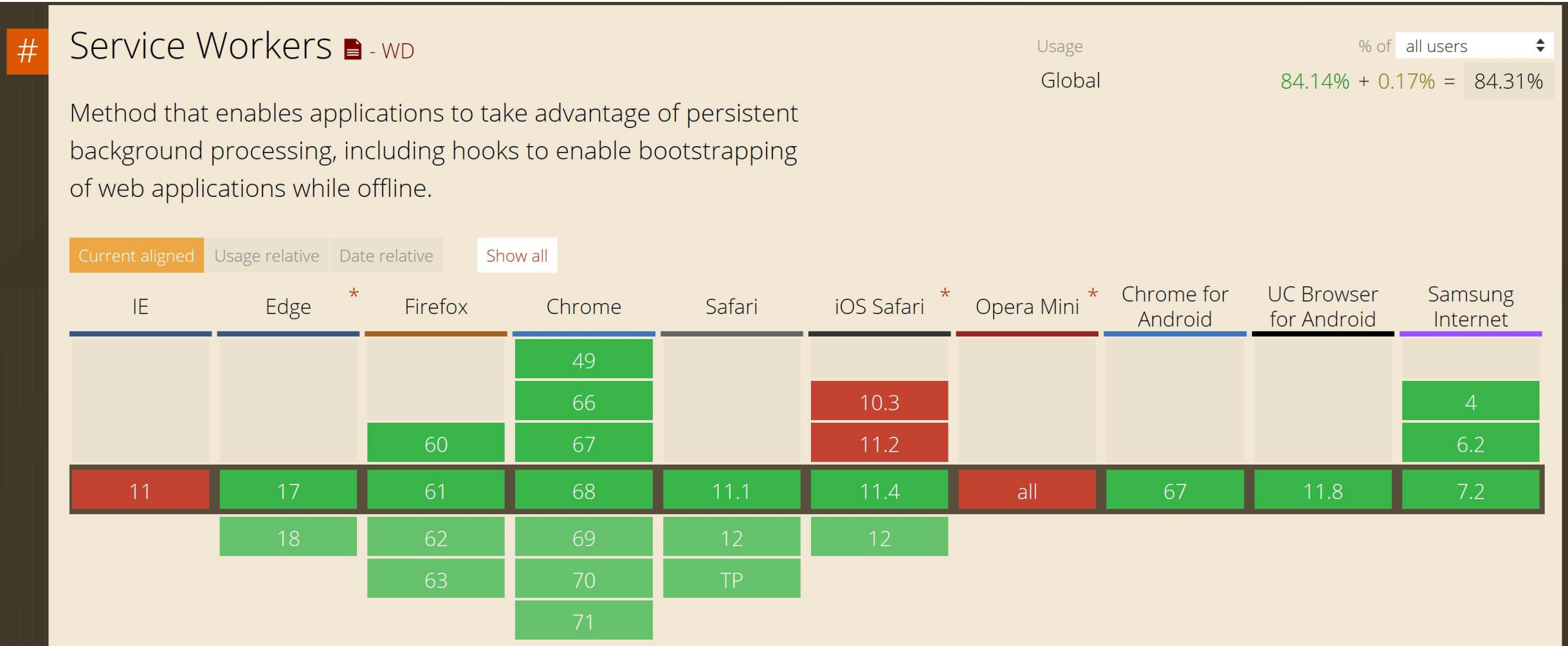
Phil Karlton

”

All I wanted was server workers



Are Service Workers ready?



https://caniuse.com/#feat=serviceworkers

Act locally, sync globally

Boyan Mihaylov
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