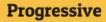# PROGRESSIVE WEB APP

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WHAT IS A PROGRESSIVE WEB APP?

- Progressive Web App (PWA) is a term used to denote a new software development methodology. Unlike traditional applications, progressive web apps are a hybrid of regular web pages (or websites) and a mobile application. This new application model attempts to combine features offered by most modern browsers with the benefits of mobile experience. If ever the best of web and the best of apps had a clone child — it is PWA.

- Progressive Web Apps are user experiences that have the reach of the web, and are:

  - ✓ **Reliable** - Load instantly and never show the downasaur, even in uncertain network conditions.

  - ✓ **Fast** - Respond quickly to user interactions with silky smooth animations and no janky scrolling.

  - ✓ **Engaging** - Feel like a natural app on the device, with an immersive user experience.

CHARACTERISTIC

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- **Progressive** — Work for every user, regardless of browser choice
- **Responsive** — Fit any form factor: desktop, mobile, tablet, or forms yet to emerge.
- **Connectivity independent** — Service workers allow work offline, or on low quality networks.
- **App-like** — Feel like an app to the user with app-style interactions and navigation.
- **Fresh** — Always up-to-date thanks to the service worker update process.
- **Safe** — Served via HTTPS to prevent snooping and ensure content hasn't been tampered with.
- **Discoverable** — Are identifiable as "applications" and service worker registration scope allowing search engines to find them.
- **Re-engageable** — Make re-engagement easy through features like push notifications. (Push and Notification APIs)
- **Installable** — Allow users to "keep" apps they find most useful on their home screen without the hassle of an app store.
- **Linkable** — Easily shared via a URL and do not require complex installation.

SERVICE WORKER

- A service worker is a type of web worker. It's essentially a JavaScript file that runs separately from the main browser thread, intercepting network requests, caching or retrieving resources from the cache, and delivering push messages.
  - ✓ A service worker is a programmable network proxy that lets you control how network requests from your page are handled.
  - ✓ Service workers only run over HTTPS. Because service workers can intercept network requests and modify responses, "man-in-the-middle" attacks could be very bad.
  - ✓ The service worker can't access the DOM directly. To communicate with the page, the service worker uses the postMessage() method to send data and a "message" event listener to receive data.
  - ✓ The service worker becomes idle when not in use and restarts when it's next needed. You cannot rely on a global state persisting between events. If there is information that you need to persist and reuse across restarts, you can use IndexedDB databases.
    - IndexedDB is a large-scale, NoSQL storage system. It lets you store just about anything in the user's browser. In addition to the usual search, get, and put actions, IndexedDB also supports transactions.
    - The Indexed Database API is a JavaScript application programming interface provided by web browsers for managing a NoSQL database of JSON objects.
  - ✓ Service workers make extensive use of promises, so if you're new to promises, then you should stop reading this and check out Promises, an introduction.
- The service workers enable reliable and intelligent caching, background content updating, push notifications and the most attractive offline functionality to prior visited sites. This means that, after the first visit to a website, the site and app will be reliably fast even on flaky networks.

WHY BUILD A PROGRESSIVE WEB APP?

Building a high-quality Progressive Web App has incredible benefits, making it easy to delight your users, grow engagement and increase conversions.

- **Worthy of being on the home screen**
  When the Progressive Web App criteria are met, Chrome prompts users to add the Progressive Web App to their home screen.

- **Work reliably, no matter the network conditions**
  Service workers enabled Konga to send 63% less data for initial page loads, and 84% less data to complete the first transaction!

- **Increased engagement**
  Web push notifications helped eXtra Electronics increase engagement by 4X. And those users spend twice as much time on the site.

- **Improved conversions**
  The ability to deliver an amazing user experience helped AliExpress improve conversions for new users across all browsers by 104% and on iOS by 82%.

HOW TO INSTALL PROGRESSIVE WEB APPS ON CHROME

- Open the web app in question, for example, Spotify or Telegram.

- Tap Chrome's overflow menu (the three dot icon.)

- You will then be presented with an "Install [App Name Here] option.

- Select install and the app should relaunch in its own window and appear in your app list and on your desktop.

LIGHTHOUSE

- Lighthouse is an open-source, automated tool for improving the quality of web pages. We can run it against any web page, public or requiring authentication. It has audits for performance, accessibility, progressive web apps, and more.

  - ✓ Chrome Extension

  - ✓ Chrome DevTools (Audits Tab)

  - ✓ Node module (lighthouse)

- Give Lighthouse a URL to audit, it runs a series of audits against the page, and then it generates a report on how well the page did. From there, use the failing audits as indicators on how to improve the page. Each audit has a reference doc explaining why the audit is important, as well as how to fix it.