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How to Build and Distribute Any React Native App With New Expo Services

Software Mansion has been actively contributing to Expo since 2017. In addition to working on open-source parts of Expo, like Expo modules and Expo CLI, we help build and maintain the Expo infrastructure. One of the efforts that we are proud of is our work on Expo's build service.

Expo announced EAS Build last year. The service lets you build and sign any React Native project for both Android and iOS platforms, from any operating system (even from Windows!). Since the initial release, the service has gone a long way to reach General Availability in November 2021. EAS Build comes with the complimentary service - EAS Submit - that does the heavy lifting when you decide to share your application with the general audience or just submit another build to the store. The new tooling - EAS CLI - integrates seamlessly with your Expo project. You'll quickly build and distribute any React Native project using only a few simple commands.

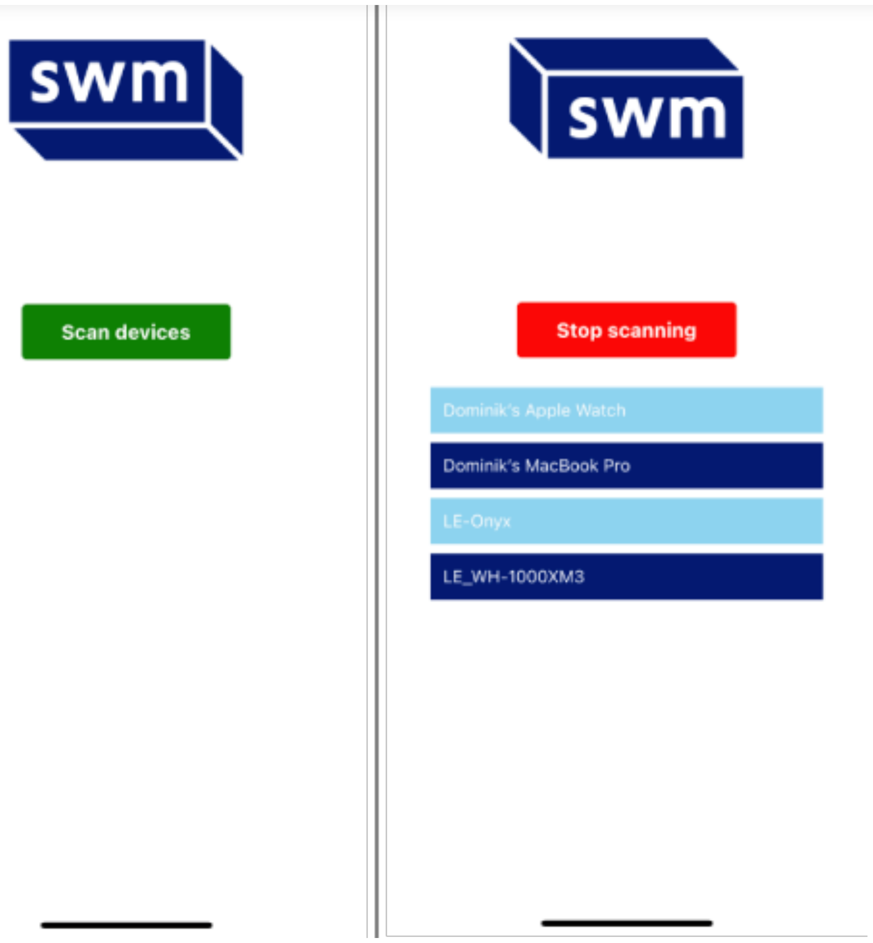
Creating a New Project

Let's build a project that uses Bluetooth to scan for nearby devices. Adding Bluetooth support was one of the top requested features by mobile developers using Expo. Expo still doesn't provide its own Bluetooth module, but you can integrate any third-party npm package, like `react-native-ble-plx` , with your Expo-powered app with minimal effort.

Unlike the classic Expo build service (`expo build:[android|ios]`), EAS Build supports building React Native projects with custom native code. *You can even build an Android or iOS project that does not use React Native at all, but this is an unadvertised feature and requires a bit of hacking.*

I initialized my project with `expo init` and chose the bare template. The bare template includes the native Android and iOS projects. This let me install and configure the `react-native-ble-plx` package which is one of the most popular options for Bluetooth in React Native.

After adding a button to start/stop scanning nearby devices, integrating with Bluetooth, and displaying the device list, the app is ready for distribution.



Simple Bluetooth Scanner

You can find the app's source code at https://github.com/dsokal/bluetooth-scanner.

Start Using EAS

Using EAS Build & Submit does not require too much configuration. All you need is the new CLI called EAS CLI. You can install it like any other npm package - `npm install -g eas-cli`.

Installing the CLI is the first step. The second and last step is configuring the project to be built with EAS Build. Run `eas build:configure` and choose which platforms you want to configure. *Tip: alternatively, you can just run* `eas build` *to both configure your project and start a build.*

EAS Build & Submit are configured with the `eas.json` file. EAS CLI uses the concept of build/submit profiles so that you can define your development and production workflows once and then switch between them with the `--profile PROFILE_NAME`

```
  },
  "build": {
    "development": {
      "distribution": "internal",
      "android": {
        "gradleCommand": ":app:assembleDebug"
      },
      "ios": {
        "buildConfiguration": "Debug"
      }
    },
    "preview": {
      "distribution": "internal"
    },
    "production": {}
  },
  "submit": {
    "production": {}
  }
}
```

It comes with predefined build profiles that allow you to take advantage of the most powerful Expo/EAS features: Development Builds, Internal Distribution, and credentials management.

Development Builds

Mobile app development can be frustrating. An Android or iOS build of your app can take a few minutes and when you first start building your app, you'll have to rebuild the project quite often. React Native itself can be an answer to this problem. You usually don't need to touch the native code, and instead, you'll change the JavaScript code. Because of that, native project (re)builds don't take long.

When starting your mobile app project in Expo, you're equipped with a great tool called Expo Go. It lets you develop your app without the need to build native projects. Install the app onto your phone, run `expo start` in the project directory, scan the QR code, and start developing. Every time you change the code, the app refreshes in the blink of an eye.

app with Expo Go. Development Builds are the answer to the problem. You can build your custom Expo Go-like client app that will contain all the native modules your app needs. Also, unlike the Expo Go app, the development build won't include all Expo modules that you don't use. This makes your custom client app lightweight and closer to your production environment.

To use Development Builds, install the `expo-dev-client` package in your project, follow the instructions on the page (only if using bare workflow), and then run `eas build --profile development` . When building for iOS, you will need to register a device with EAS before it can run your app through Internal Distribution. This step is covered in the next paragraph. *Keep in mind that Development Builds are still in preview!*

Internal Distribution

Whenever you're working on a new feature for your app, you want to make sure it works the way it was designed. This usually involves building your app and sharing it with a QA team. Even though the task is fairly simple on Android (you just need to build an APK instead of AAB), there are a few problems on iOS when using TestFlight:

- The processing time of your new build can take even as long as 30 minutes.
- TestFlight can only have one active build at a time.
- TestFlight app needs to be installed on the iPhone/iPad.

EAS Build streamlines the process of building apps for internal usage with Internal Distribution. Just set `"distribution": "internal"` in the build profile (or use the predefined build profile - `preview`) and you can share your build with anyone within a few minutes.

On iOS, you'll also need to register all devices (iPhones and iPads) with `eas device:create` but it's as simple as scanning a QR code and following instructions displayed on the screen.

When you have registered all your devices, run `eas build --profile preview` and you'll get a sharable URL for your build (and a QR code). Open it on any of the

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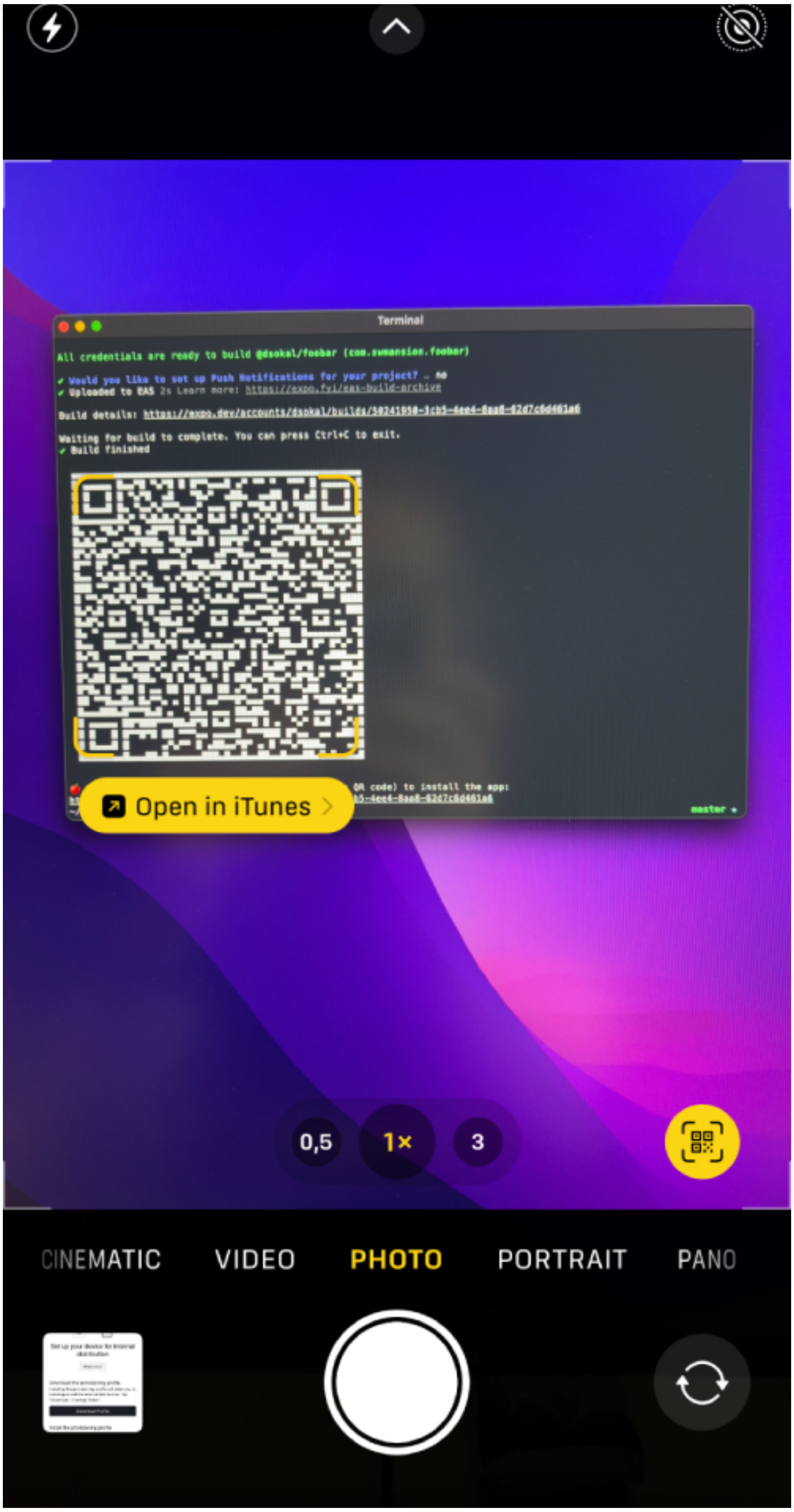


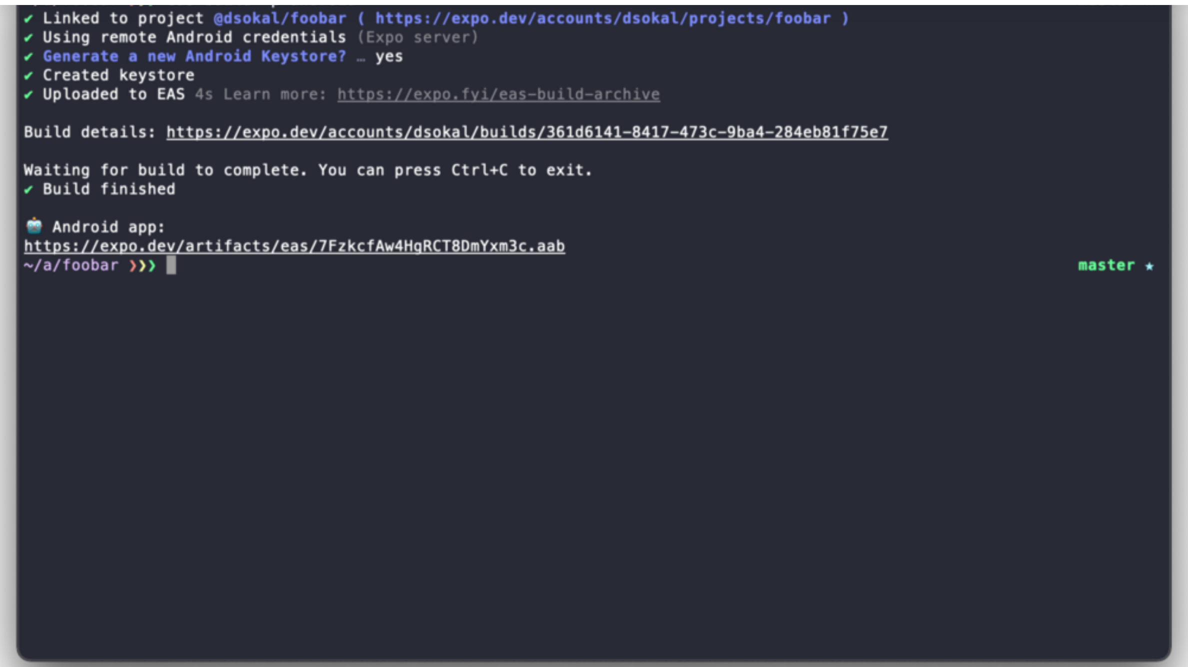
```
All credentials are ready to build @dsokal/foobar (com.swmansion.foobar)

✔ Would you like to set up Push Notifications for your project? … no
✔ Uploaded to EAS 2s Learn more: https://expo.fyi/eas-build-archive

Build details: https://expo.dev/accounts/dsokal/builds/50241950-3cb5-4ee4-8aa8-62d7c6d461a6

Waiting for build to complete. You can press Ctrl+C to exit.
✔ Build finished

                                    QR code) to install the app:
                                    b5-4ee4-8aa8-62d7c6d461a6
                                                                            master ✦
```

Building App for Public Distribution

When the time comes (and the QA team approves the latest build) you will want to distribute the app on the Google Play Store and Apple App Store. EAS Build comes in handy not only for you but for your whole team. You configure the project once and the whole team can benefit from that. Everyone added to the Expo organization can run builds the same way as the person who configured the project. Similarly, using the same exact command, you can run a build from CI. On top of that, when building a mobile app, you sometimes need to be an expert on the credentials needed to sign your app (you need to know what's Distribution Certificate, Provisioning Profile, Push Notifications Key, Keystore, and so on).

EAS Build allows you to build your native project in the cloud, in the already pre-configured environment, and also takes care of credentials management. This means you don't need to have Android Studio and Xcode installed on your computer. You don't even need to have a Mac to build an iOS app. Lastly, you don't need to know what's a Keystore and even how to generate one.

Building a React Native project for store distribution is just a matter of running `eas build` in the project directory. EAS CLI walks you through the entire credentials management process and prints the URL to the build details page where you can track the build's progress and view build logs. When the build completes you'll get a URL to the build artifact.



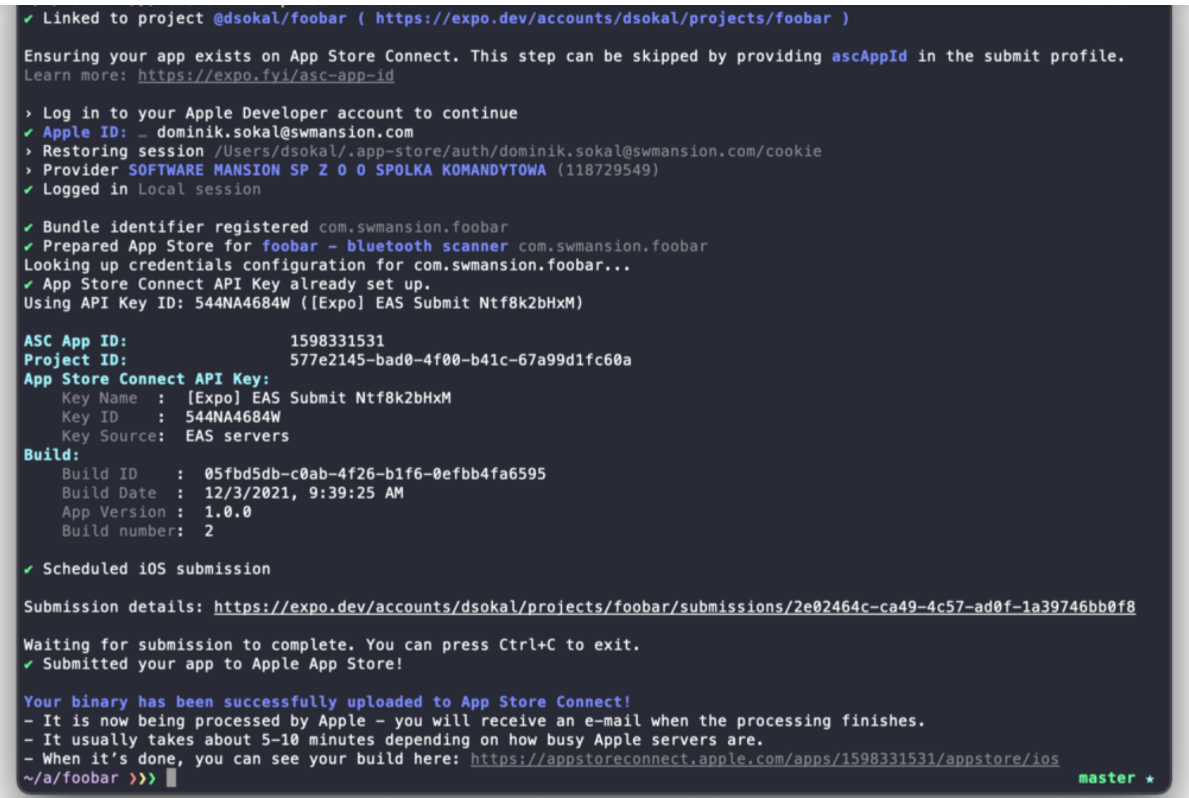
```
✔ Linked to project @dsokal/foobar ( https://expo.dev/accounts/dsokal/projects/foobar )
✔ Using remote Android credentials (Expo server)
✔ Generate a new Android Keystore? … yes
✔ Created keystore
✔ Uploaded to EAS 4s Learn more: https://expo.fyi/eas-build-archive

Build details: https://expo.dev/accounts/dsokal/builds/361d6141-8417-473c-9ba4-284eb81f75e7

Waiting for build to complete. You can press Ctrl+C to exit.
✔ Build finished

🤖 Android app:
https://expo.dev/artifacts/eas/7FzkcfAw4HgRCT8DmYxm3c.aab
~/a/foobar ❯❯❯                                                                          master ★
```

Run **eas build** to build your project on EAS servers

Submitting App to App Store

You have your app archive ready to submit to the app store. EAS Submit can help you out with the task. If you've used EAS Build to build the project, you'll be astonished at how easy it is to submit your latest build to the app store. At the same time, EAS Submit also supports uploading apps that were built elsewhere.

The only limitation of the app submission process is that you'll have to upload your first Android build to the Google Play Store manually. This is the limitation of the Google Play Store that will hopefully be overcome in the future. iOS part of the task is more straightforward - you can upload your first build to the Apple App Store without manual intervention.

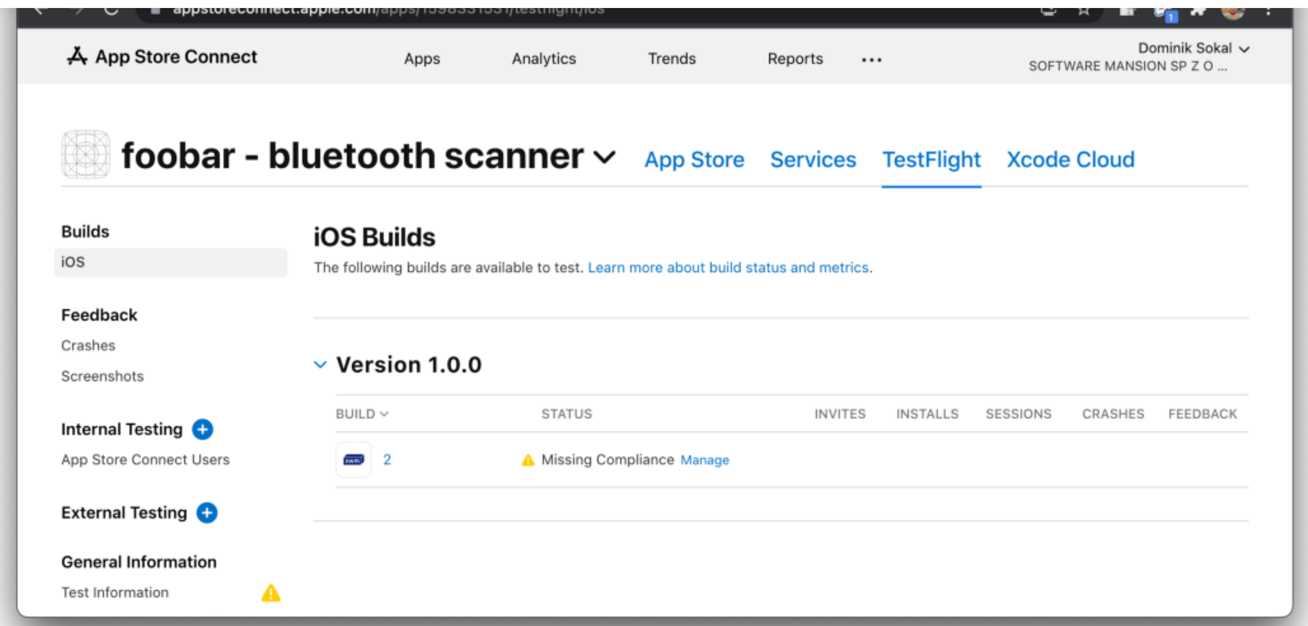


```
✔ Linked to project @dsokal/foobar ( https://expo.dev/accounts/dsokal/projects/foobar )

Ensuring your app exists on App Store Connect. This step can be skipped by providing ascAppId in the submit profile.
Learn more: https://expo.fyi/asc-app-id

› Log in to your Apple Developer account to continue
✔ Apple ID: … dominik.sokal@swmansion.com
› Restoring session /Users/dsokal/.app-store/auth/dominik.sokal@swmansion.com/cookie
› Provider SOFTWARE MANSION SP Z O O SPOLKA KOMANDYTOWA (118729549)
✔ Logged in Local session

✔ Bundle identifier registered com.swmansion.foobar
✔ Prepared App Store for foobar - bluetooth scanner com.swmansion.foobar
Looking up credentials configuration for com.swmansion.foobar...
✔ App Store Connect API Key already set up.
Using API Key ID: 544NA4684W ([Expo] EAS Submit Ntf8k2bHxM)

ASC App ID:                 1598331531
Project ID:                 577e2145-bad0-4f00-b41c-67a99d1fc60a
App Store Connect API Key:
    Key Name  :  [Expo] EAS Submit Ntf8k2bHxM
    Key ID    :  544NA4684W
    Key Source:  EAS servers
Build:
    Build ID    :  05fbd5db-c0ab-4f26-b1f6-0efbb4fa6595
    Build Date  :  12/3/2021, 9:39:25 AM
    App Version :  1.0.0
    Build number:  2

✔ Scheduled iOS submission

Submission details: https://expo.dev/accounts/dsokal/projects/foobar/submissions/2e02464c-ca49-4c57-ad0f-1a39746bb0f8

Waiting for submission to complete. You can press Ctrl+C to exit.
✔ Submitted your app to Apple App Store!

Your binary has been successfully uploaded to App Store Connect!
- It is now being processed by Apple - you will receive an e-mail when the processing finishes.
- It usually takes about 5-10 minutes depending on how busy Apple servers are.
- When it's done, you can see your build here: https://appstoreconnect.apple.com/apps/1598331531/appstore/ios
~/a/foobar ❯❯❯                                                                                            master ★
```

Uploading the latest iOS build to the Apple App Store

Run `eas submit -p PLATFORM --latest` to submit the latest build to the app store. If you haven't used EAS Submit before, EAS CLI is going to ask you for your Apple ID credentials (to generate an API Key) or Google Service Account Key. If you choose to store the API keys on EAS servers, all subsequent submissions are going to be already pre-configured.

787 | 2



iOS Builds

The following builds are available to test. Learn more about build status and metrics.

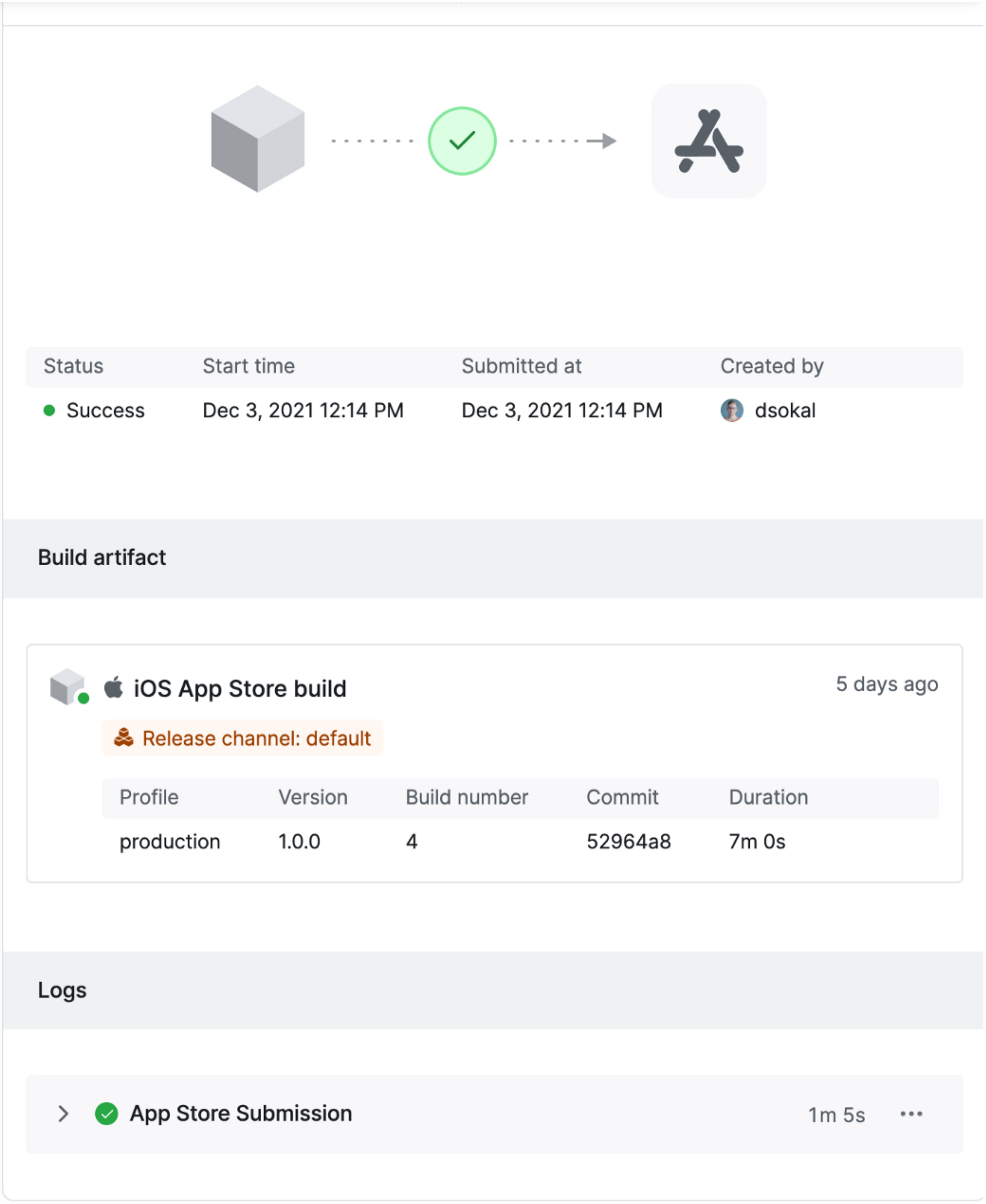
Version 1.0.0

BUILD	STATUS	INVITES	INSTALLS	SESSIONS	CRASHES	FEEDBACK
2	Missing Compliance Manage					

The iOS submission can be later reviewed in the App Store Connect

Automating Build & Submit Process

As you've already seen, EAS Build & Submit can make your app development workflows easier for you and your team. However, this is not yet everything that EAS has to offer. Yo can further automate your workflows with automatic build submissions. That is, you can tell EAS to submit your app to the appropriate app store on a successful project build. To so, run the build the same way as previously but add the `--auto-submit` flag. If you want t build your project for both Android and iOS, and upload the builds to the app stores afterward run `eas build -p all --auto-submit` and enjoy your cup of coffee - EAS is going take care of the rest.



Status	Start time	Submitted at	Created by
● Success	Dec 3, 2021 12:14 PM	Dec 3, 2021 12:14 PM	dsokal

Build artifact

iOS App Store build 5 days ago

Release channel: default

Profile	Version	Build number	Commit	Duration
production	1.0.0	4	52964a8	7m 0s

Logs

> ✓ App Store Submission 1m 5s

Automating App Store submissions feels like magic

If the EAS-provided automatic submissions are not flexible enough for you, you can alwa that are not yet supported by EAS.

Focus On Important Things

Building and submitting Expo/React Native projects has never been easier than now. The has always been a not-well-answered question in the community — "Should I use Expo or React Native?". The answer seems obvious now — "It doesn't matter, but Expo is the right choice if you want to save time.". With EAS Build & Submit you can focus on what's the m important for the success of your mobile app — the app itself.

Thanks to Krzysztof Magiera and Brent Vatne