Introducing OpenPush

A Free, Decentralized Push Messaging Framework for Android

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About Me

Hi, I'm Marcus!

Free software developer from Berlin.

Working on a free Android ecosystem.

F-Droid core contributor and maintainer.

Push Notifications

- One of the key missing pieces for apps on **F-Droid**
- Server sending **unsolicited** content to an app on your phone
- Used for ~~SPAM~~ marketing purposes
- But also essential for any kind of **instant messaging** or **VoIP** client

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Keeping an open connection for every app is not a great idea.

Status Quo

- Currently there's **Firebase Cloud Messaging** (FCM), formerly **Google Cloud Messaging** (GCM)
- Firebase is a **proprietary platform** owned by Google
- Requires **Google Play Services** being present on the device
- AND requires each app to include a **proprietary library** to receive push notifications.

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- AND requires each app to include a **proprietary library** to receive push notifications.
    - All your messages are sent to to google
    - Your FOSS apps **aren't FOSS** anymore
    - Riot, Conversations, Firefox, Jami, RocketChat, Nextcloud, ...
    - No **decentralization** possible

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Or you need to distribute your own APKs as a platform host.

Alternatives?

- Everyone builds their more or less reliable custom solution
- Some protocols can do it reasonably well in-band (like XMPP)
- But Android makes it increasingly hard to run background tasks
- Battery life is still horrible

OpenPush Goals

1. **Free Software**: Including server, client and client library parts
2. **Decentralized**: You can run your own instance.
3. **User is in Control**
    - Smartphone user chooses pusherver instance.
    - User decides which apps are allowed to subscribe to push notifications.
4. **No developer key required**
    - Used by Google for **accounting** and possibly abuse mitigation.
    - Provide a service to users not app developers, so we don't need accounting there
    - Find other methods for abuse mitigation

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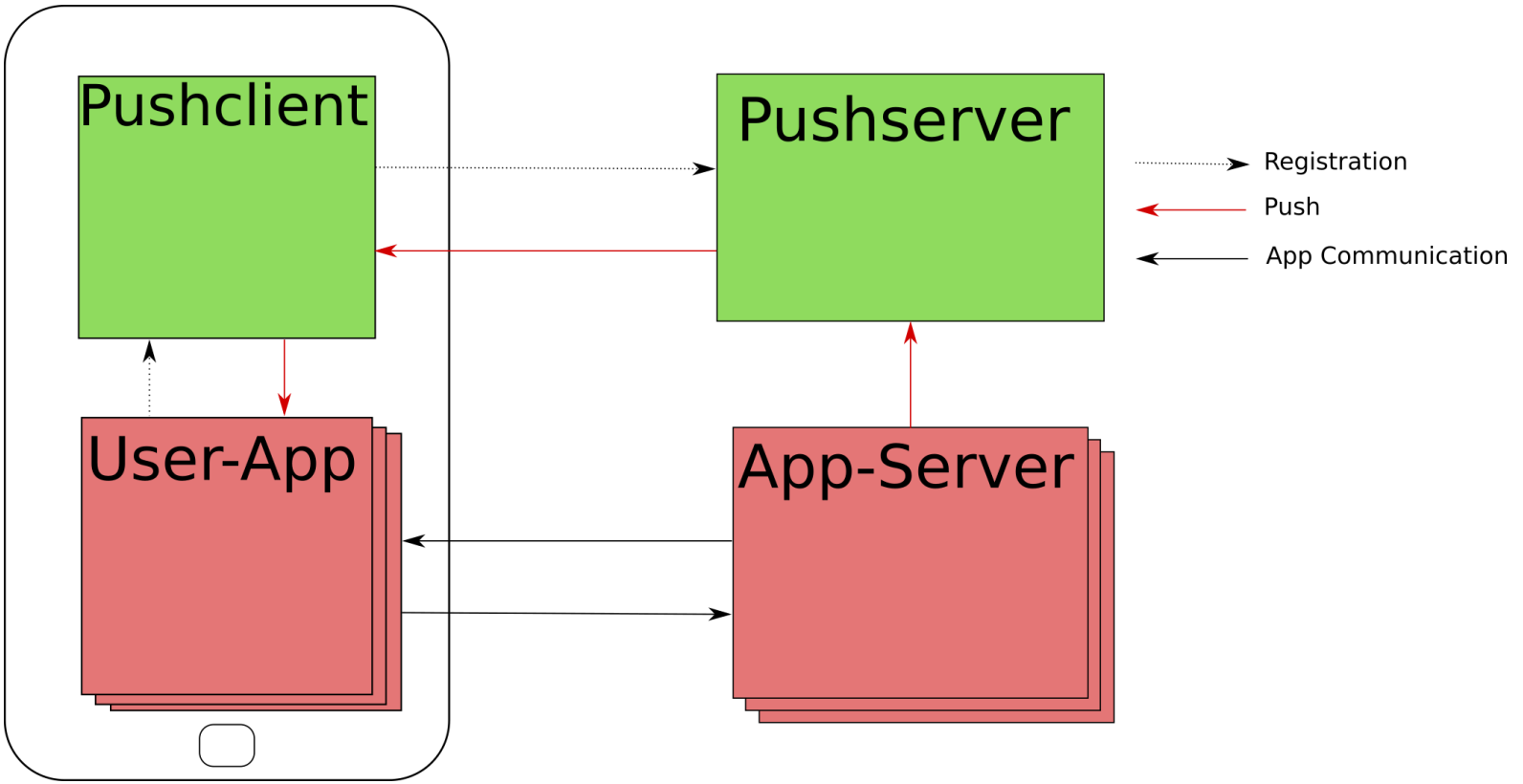
- **Pushclient**:
  - Handles **app** registration
  - Keeps an open connection to a **pushserver**. Distributes push messages to **apps**.

Architecture



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- **Integration into other Systems ===> ToDo!**

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Currently using **Server-Sent Events**.

Deliberately **transparent** to users of OpenPush, so we can experiment with different protocols.

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Pushclient

Currently a **standalone Android app**.

Possible integration with **MicroG** in the future.

Connection kept alive by using a **foreground service** (or being a system app).

Client library communicates via **Android IPC** mechanisms (bound service and broadcast intents).

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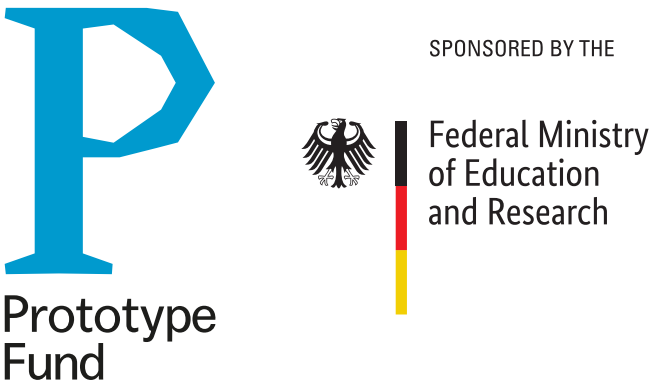
- Experimenting with **different transports**
- Having existing systems provide the **OpenPush APIs**
  - I.e. Pusherver API provided by an **XMPP/Matrix** server
  - Apps register for push notifications with your existing **XMPP/Matrix** app

Acknowledgements

The original development of the OpenPush project was sponsored by the German Federal Ministry of Education and Research through the Prototype Fund program.



Find more info at https://bubu1.eu/openpush