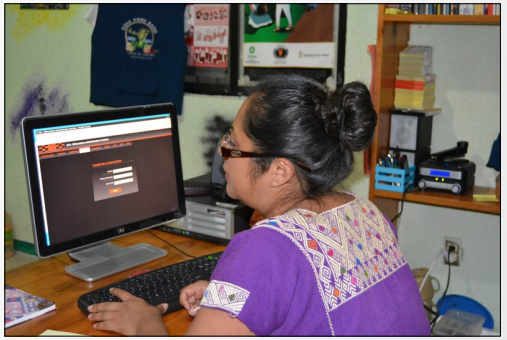
Web**Ph.one**

Connecting Community Cellular Networks using WebRTC and PWA

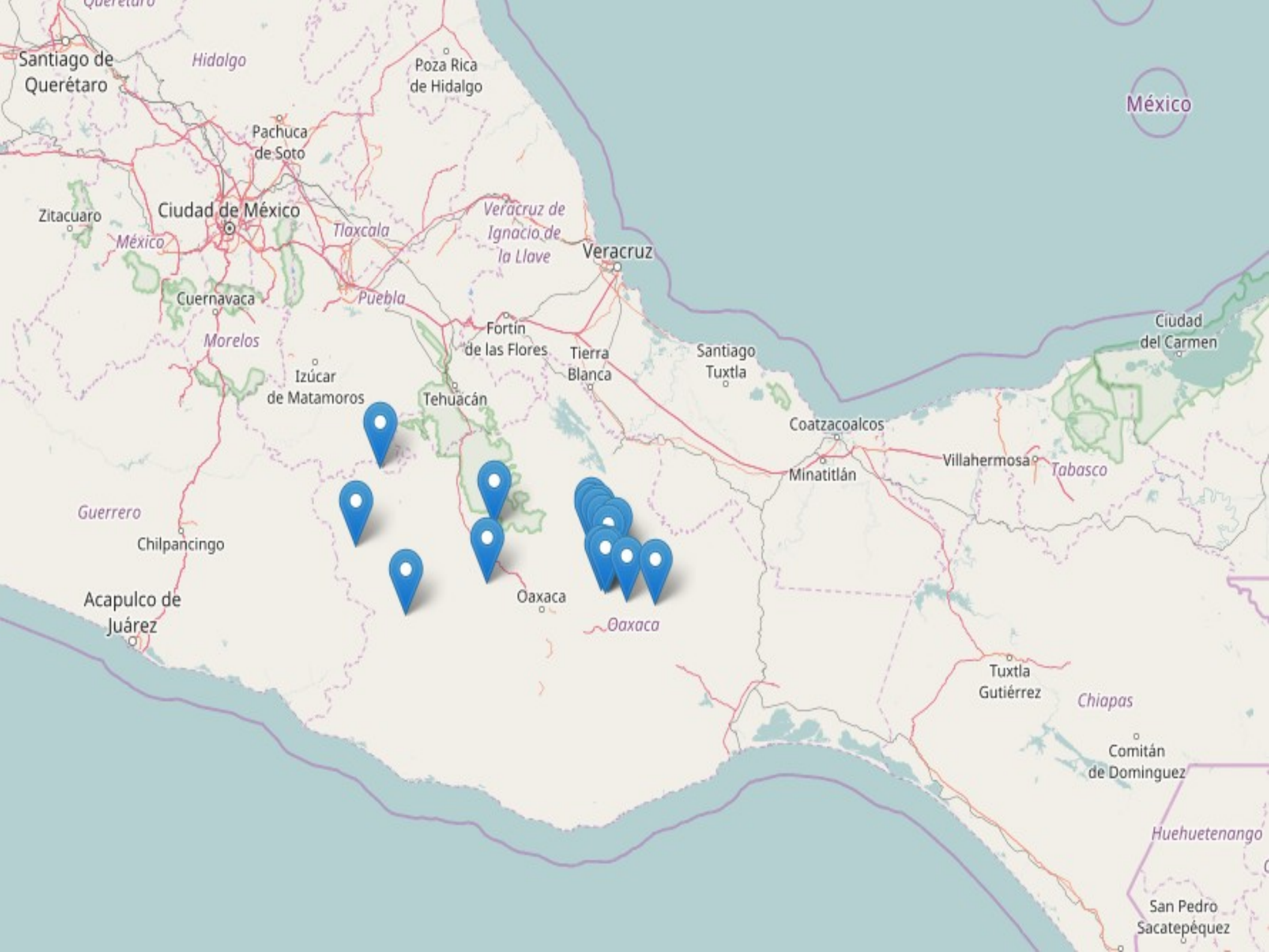
FOSDEM 2018, Stefan Sayer

Rhizomatica, TIC AC



Santa María Alotepec, Mexico

“Rhizomatica supports communities who need or want to build and maintain self-governed and owned telecommunications infrastructure.”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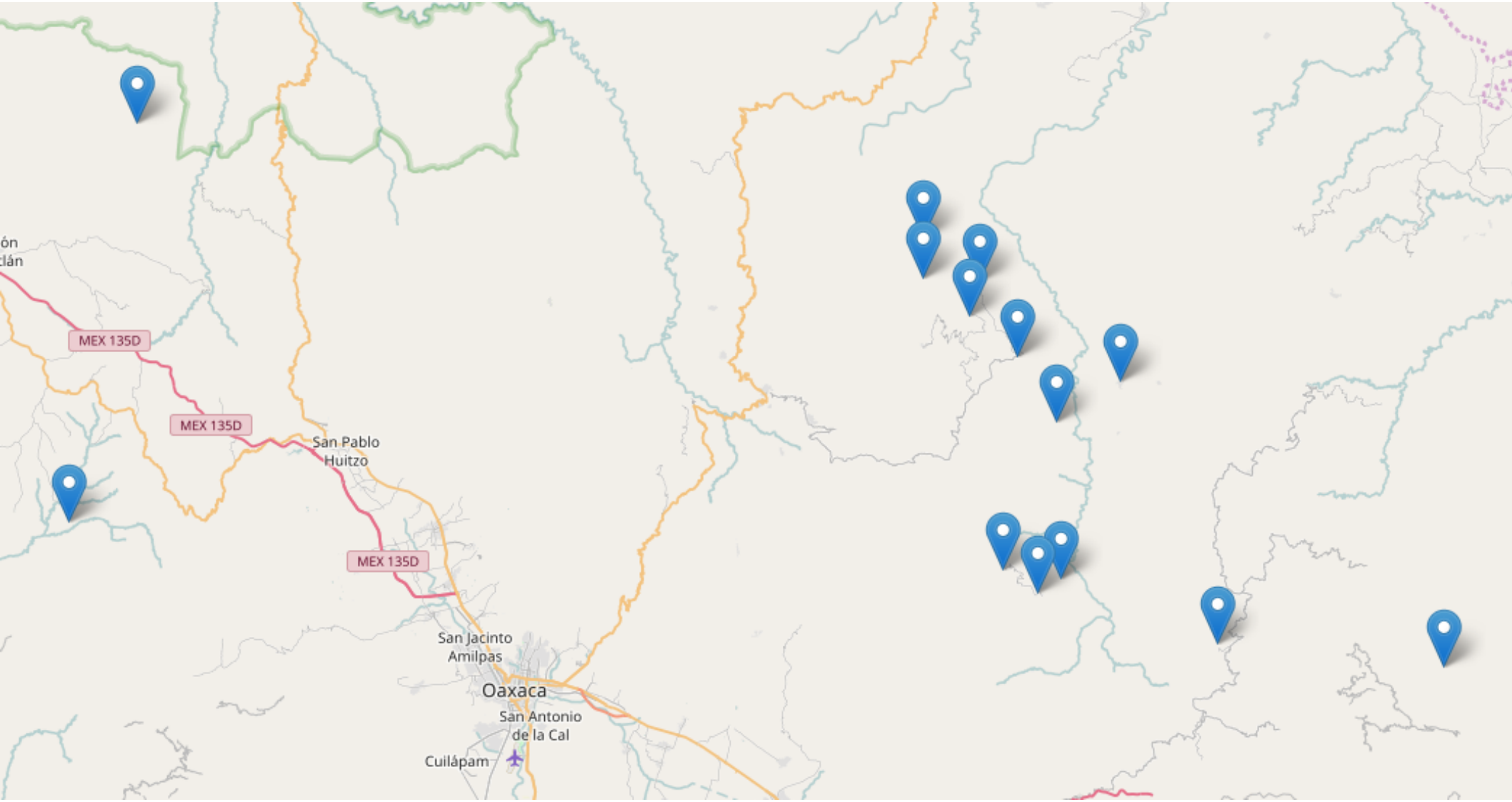
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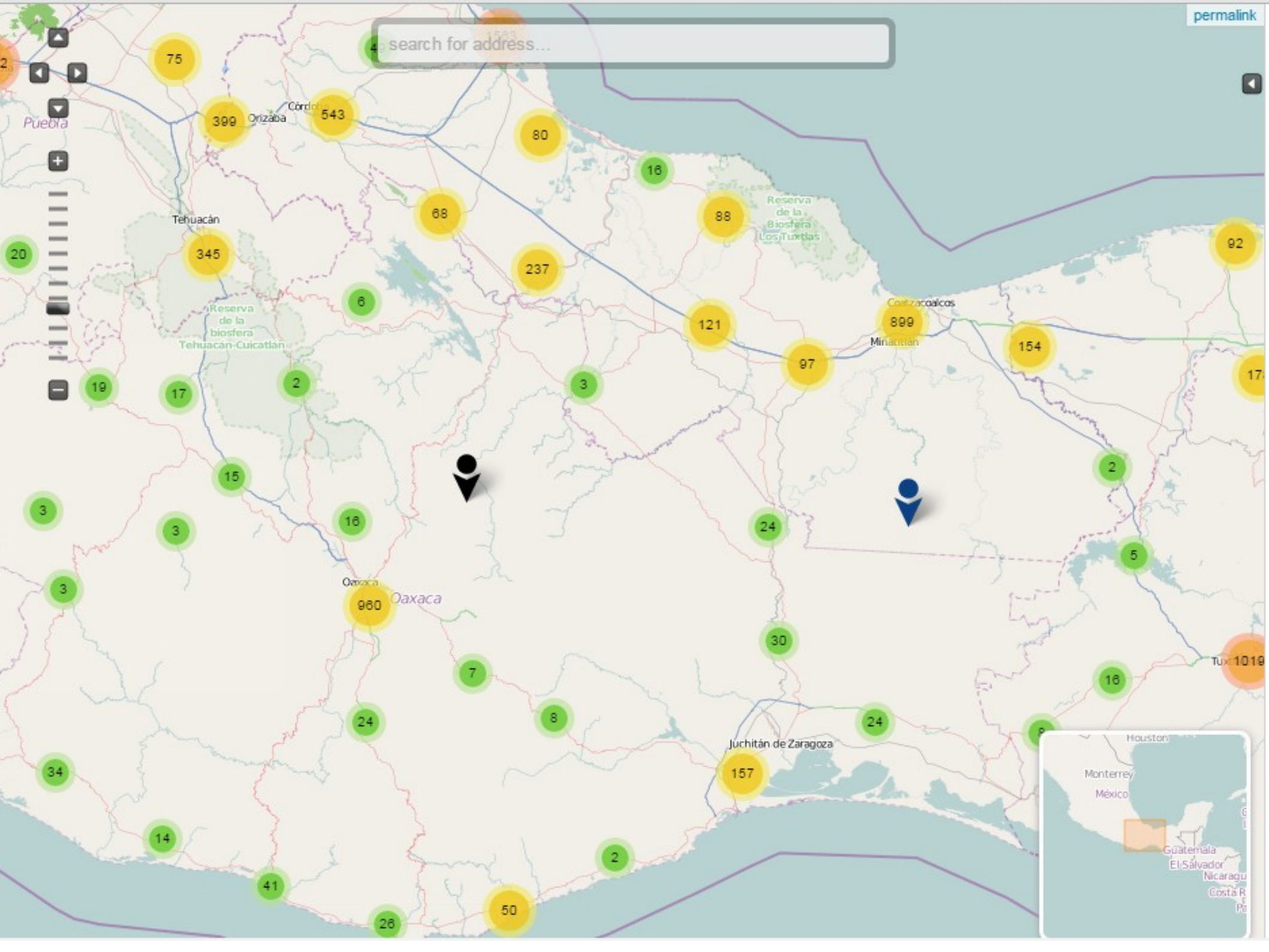
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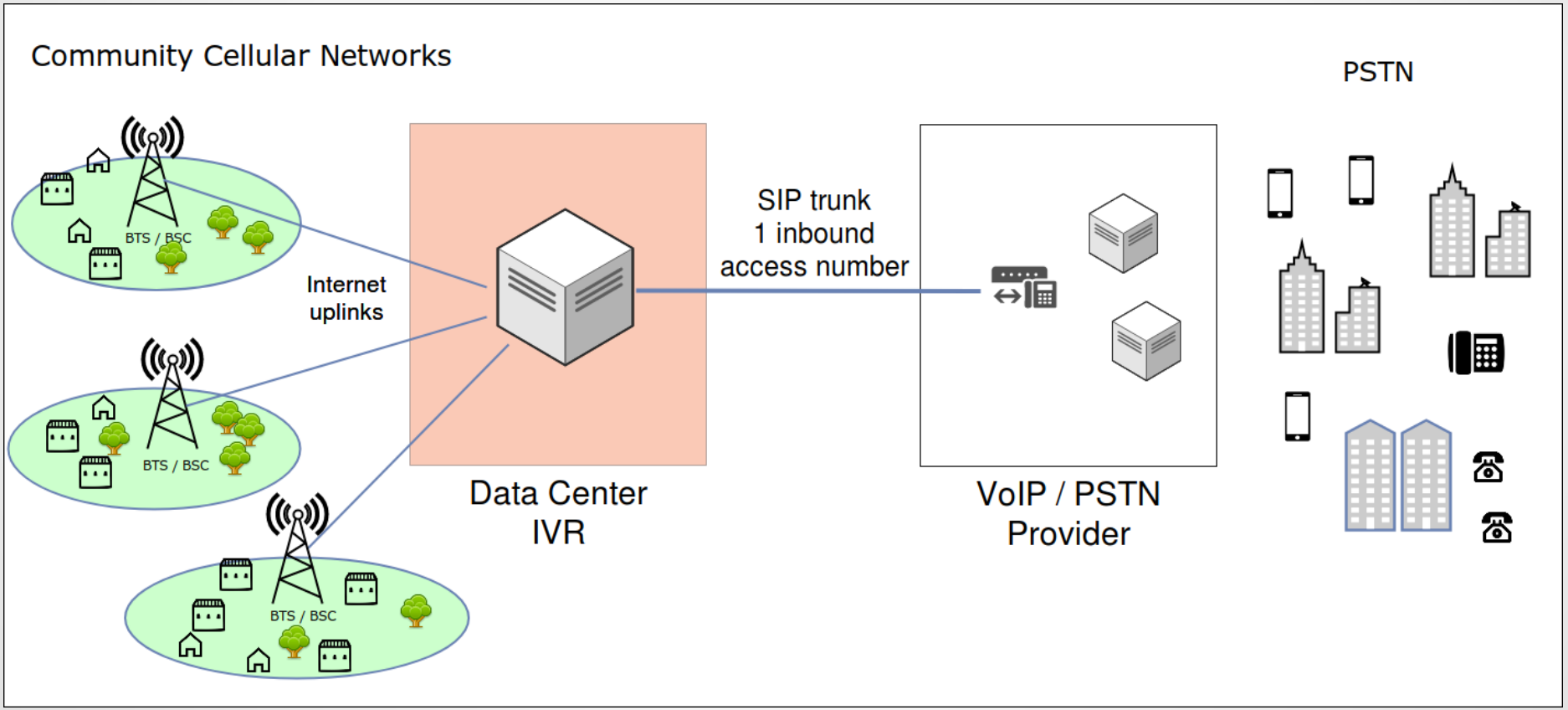
SayCel

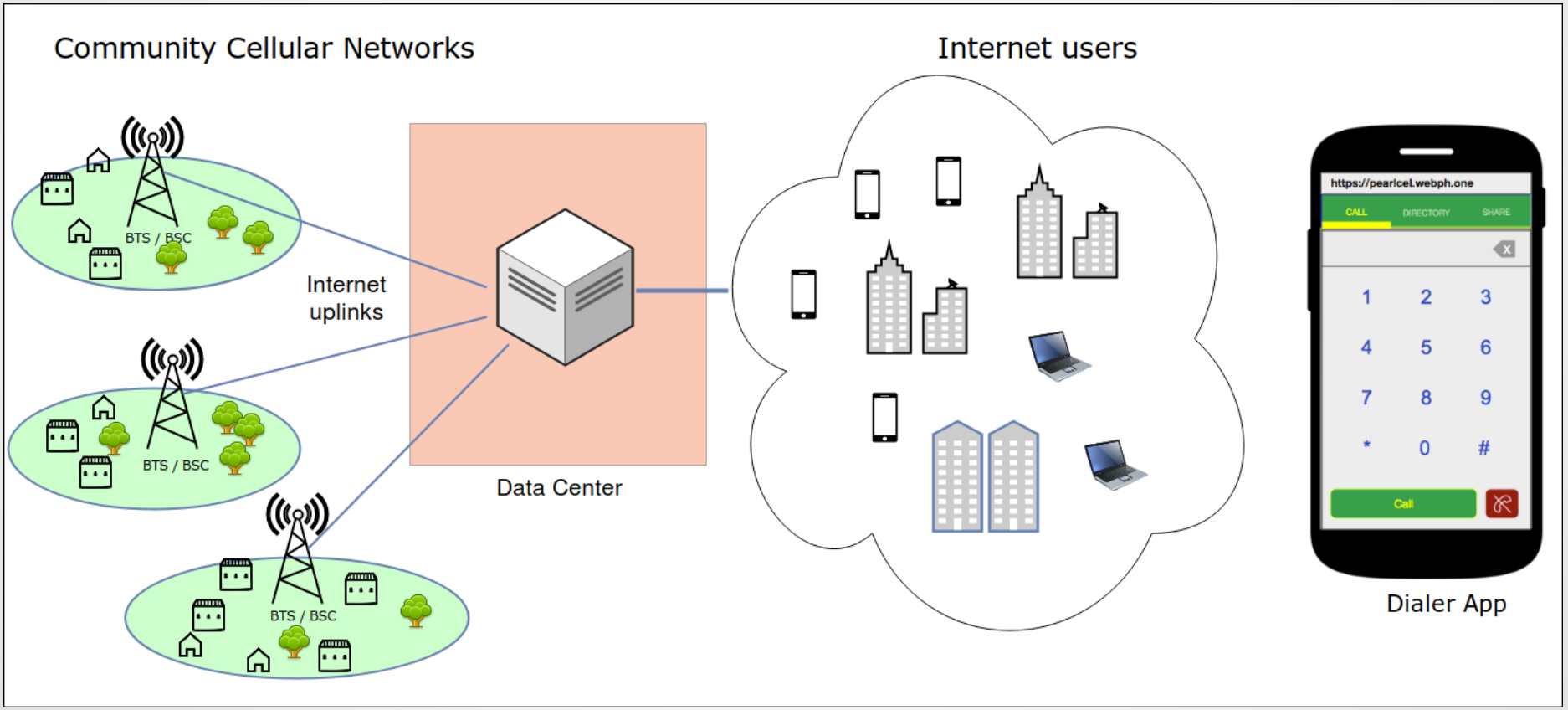
Pearl Lagoon, Nicaragua

“SayCel is a research and development company dedicated to creating communications and infrastructure solutions for developing communities.”

Connecting CCNs to the PSTN



Goal: Connect directly



Requirements

- Easy to use
- Lightweight
- Smartphone and desktop
- Keep implementation accessible

VoIP App: Go Native or Web?

Native

- Adapt existing VoIP Apps, e.g. CSipSimple ?
- Involves testing on lots of phone models and OS versions
- Low level tech knowledge required

Web App

- Runs on desktop and mobile
- Test “only” browsers
- Web tech for UI, WebRTC for VoIP stack

Progressive Web App

- Just a normal website with JS
- “Add to home screen”

  With

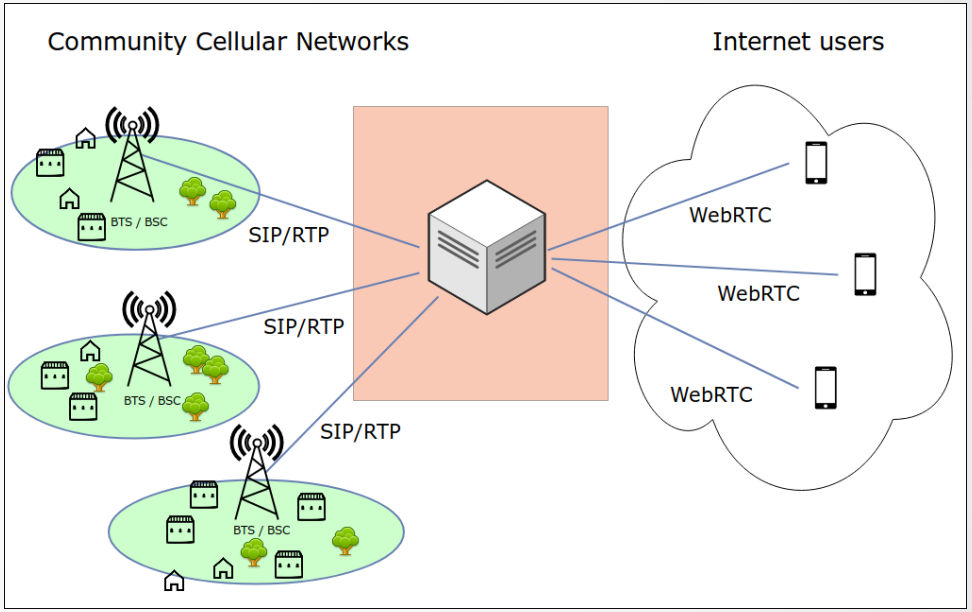
  - Caching for quick loading
  - Service workers – e.g. cache control, push notifications
  - In-Browser DB

WebRTC

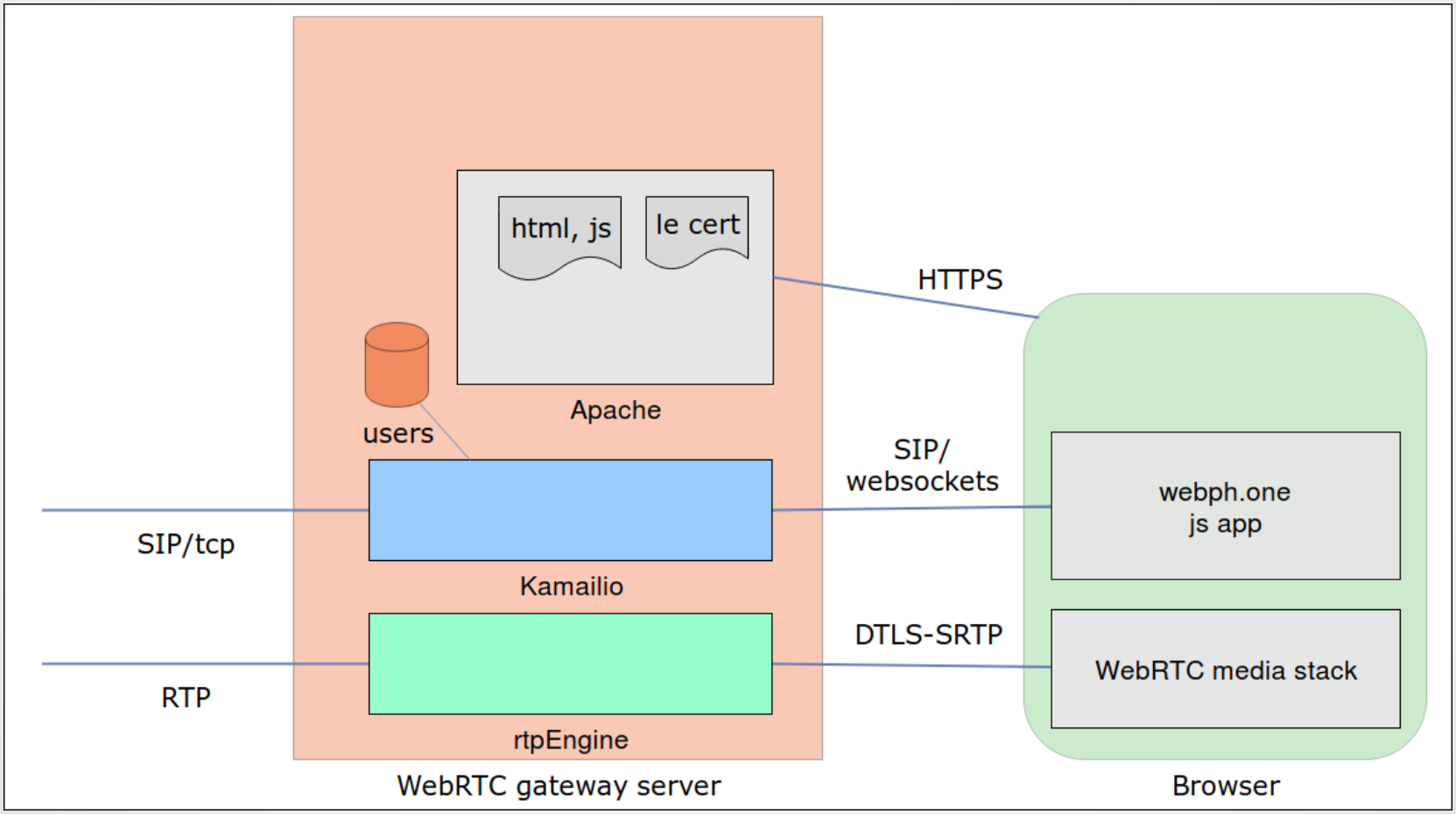
- Excellent VoIP media stack in the browser
- Encryption, NAT handling, PLC/Jitter, EC
- JsSIP library for easy SIP interop

The whole system

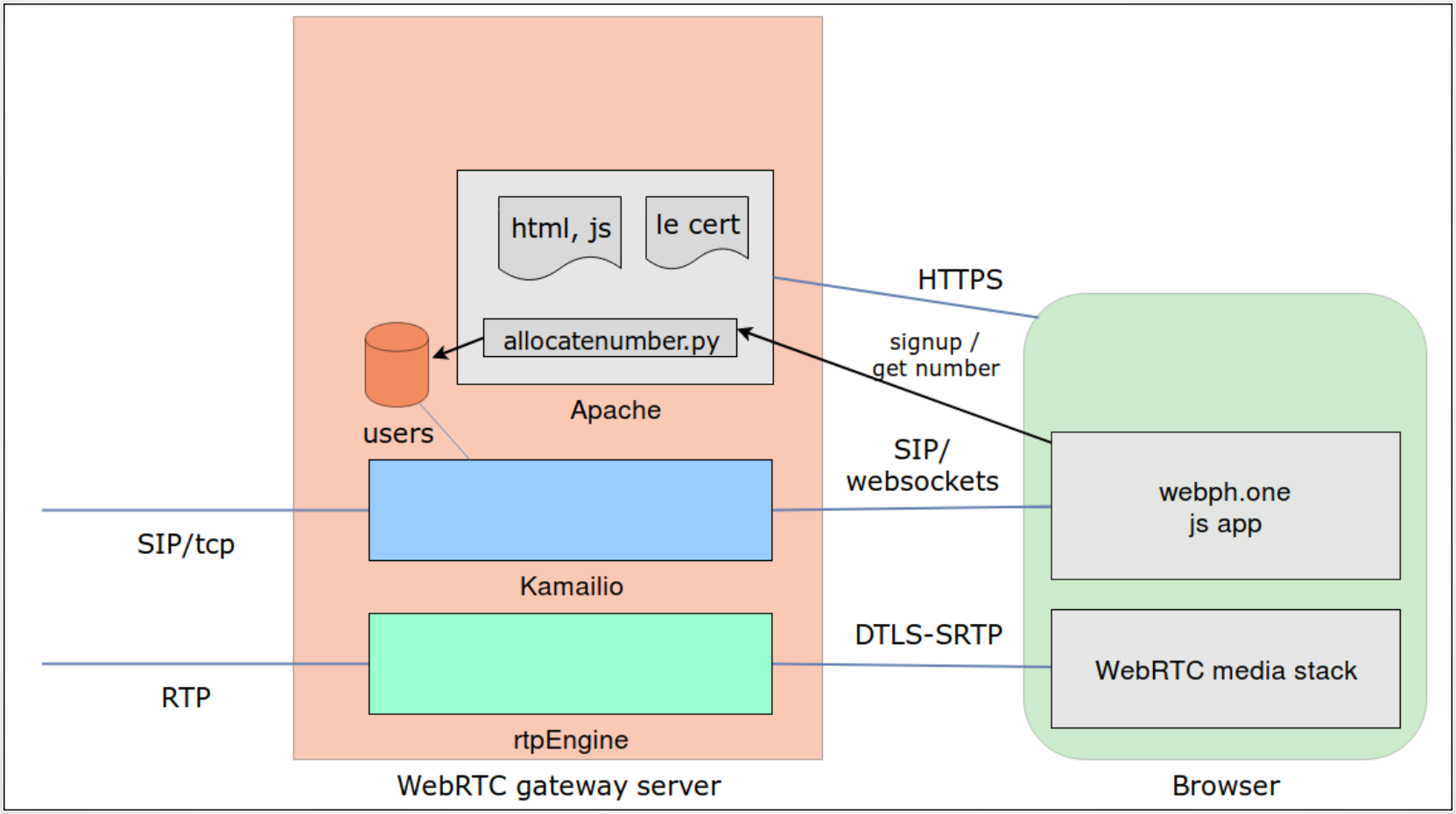
- SIP – WebRTC gateway
- User Registrations
- Push Notifications
- SMS text as MESSAGE



...in more detail



User signup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WebRTC media stack
RTP
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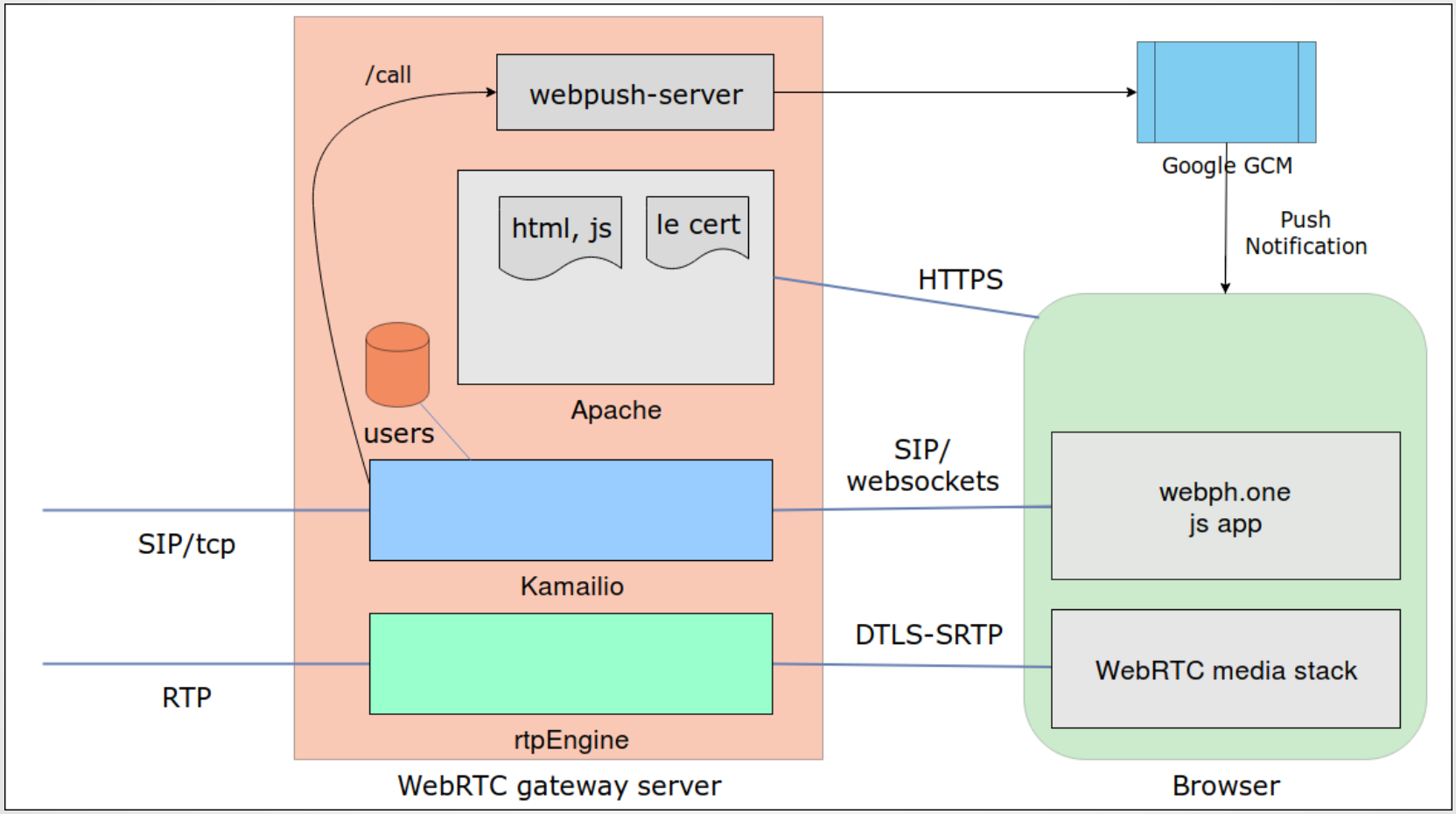
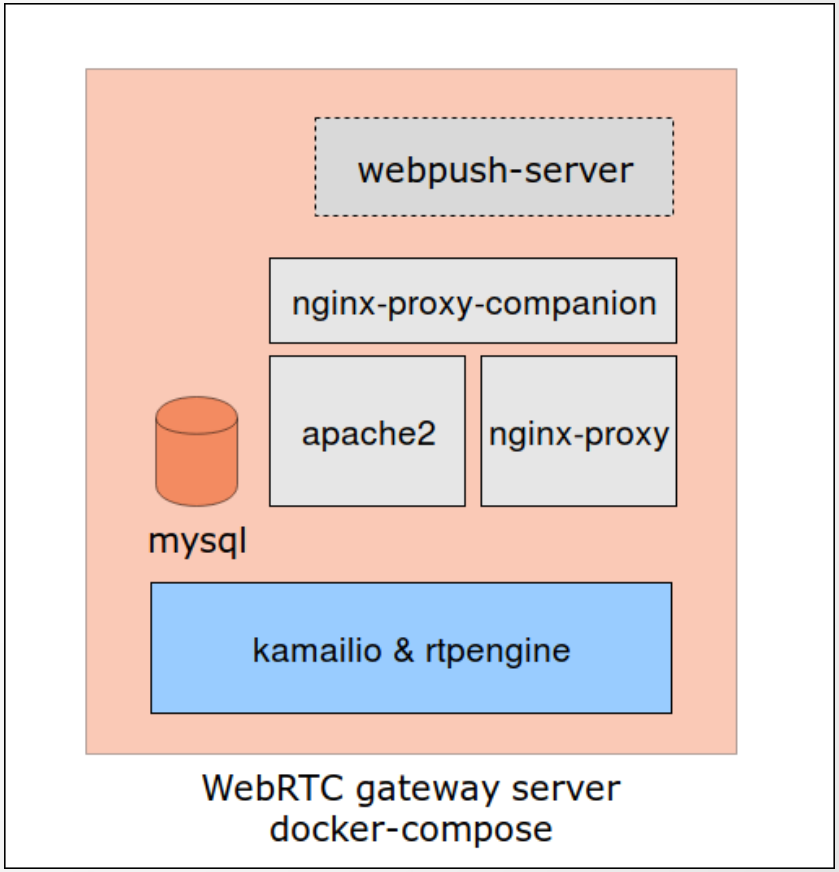
Browser

Push notfications



Development collaboration

- Targets complete install with one line
- Collaborate on docker-compose files for server
- Currently not complete



Challenges and Issues

- Pure Web App limitations
  - No Phonebook API
  - No output selection API (earphone/speaker)
  - Push Notifications

  → Possibly solved by small native wrapper around the web app?

Challenges (II)

- Combining Web and Telco worlds

  → Agile development style is good

- Polished User Experience is not easy

  → Tech behind a simple UI is complex

  → needs lots of testing

Future developments

- Offline deployments for WiFi mesh networks
- Alternative to Google Push Notifications (GCM/FCM), also for offline deployments
- Make Texting (SMS) work

Join the project!

- Project Website
  http://webphone.saycel.com/
- Web App source
  https://github.com/saycel/webph.one
- Docker-compose of the server
  https://github.com/saycel/Saycel.Phone
- Mailing list
  https://www.freelists.org/list/webphone-discuss