Building a Social App on top of Matrix

Fighting surveillance capitalism for fun and profit

made for matrix

Charles V. Wright
Lead Software Engineer at FUTO
cvwright@futo.org

Matrix Dev Room
Brussels, 2023-02-05

Bio / Introduction

About me

👨‍🎓 Former CS professor

☣️ Security and privacy researcher

👨‍👩‍👧 Husband and dad

About FUTO

- Founded in 2021 by Eron Wolf, creator of Yahoo! Games
- Mission:
  - Empower users
  - Reduce reliance on tech giants

FUTO

Motivation

How to securely … share baby photos ???

	Cross Platform	Private	Async Convenience
Google Photos	✗	✗	✓
Apple Photos (iCloud)	✗	?	✓
Facebook / Instagram	✓	✗	✓
Photobucket / Shutterfly / etc	Web	✗	✓
Signal etc (Matrix, Wire, Wickr, Threema, …)	✓	✓	✗

Motivation

How to securely … share vacation photos ???

	Cross Platform	Private	Async Convenience
Google Photos	✗	✗	✓
Apple Photos (iCloud)	✗	?	✓
Facebook / Instagram	✓	✗	✓
Photobucket / Shutterfly / etc	Web	✗	✓
Signal etc (Matrix, Wire, Wickr, Threema, …)	✓	✓	✗

Motivation

How to securely … run an online book club ???

	Cross Platform	Private	Async Convenience
Google Photos	✗	✗	✓
Apple Photos (iCloud)	✗	?	✓
Facebook / Instagram	✓	✗	✓
Photobucket / Shutterfly / etc	Web	✗	✓
Signal etc (Matrix, Wire, Wickr, Threema, …)	✓	✓	✗

ELIO FRATTAROLI Att läka själen i hjärnans tidsålder
Alice Hoffman Magiane
Nan Östman En varm vänskap
Helén Kinnman SKILJ DIG SJÄLV

Motivation

How to securely … share baby photos ???

	Cross Platform	Private	Async Convenience
Google Photos	✗	✗	✓
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Signal etc (Matrix, Wire, Wickr, Threema, …)	✓	✓	✗

Goals

1. **Most of the convenience of Facebook**
    - Read: Easily keep up with a few hundred people
    - Write: Easily publish updates for all your friends to see
    - Explicitly asynchronous

2. **Most of the security and privacy of Signal**
    - Confidentiality: Servers can’t spy on your messages
    - Integrity: Servers can’t inject junk into your timeline

3. **Freedom from Big Tech megacorps**
    - Independence: Users can run their own servers

High-Level Goal: Social Networking

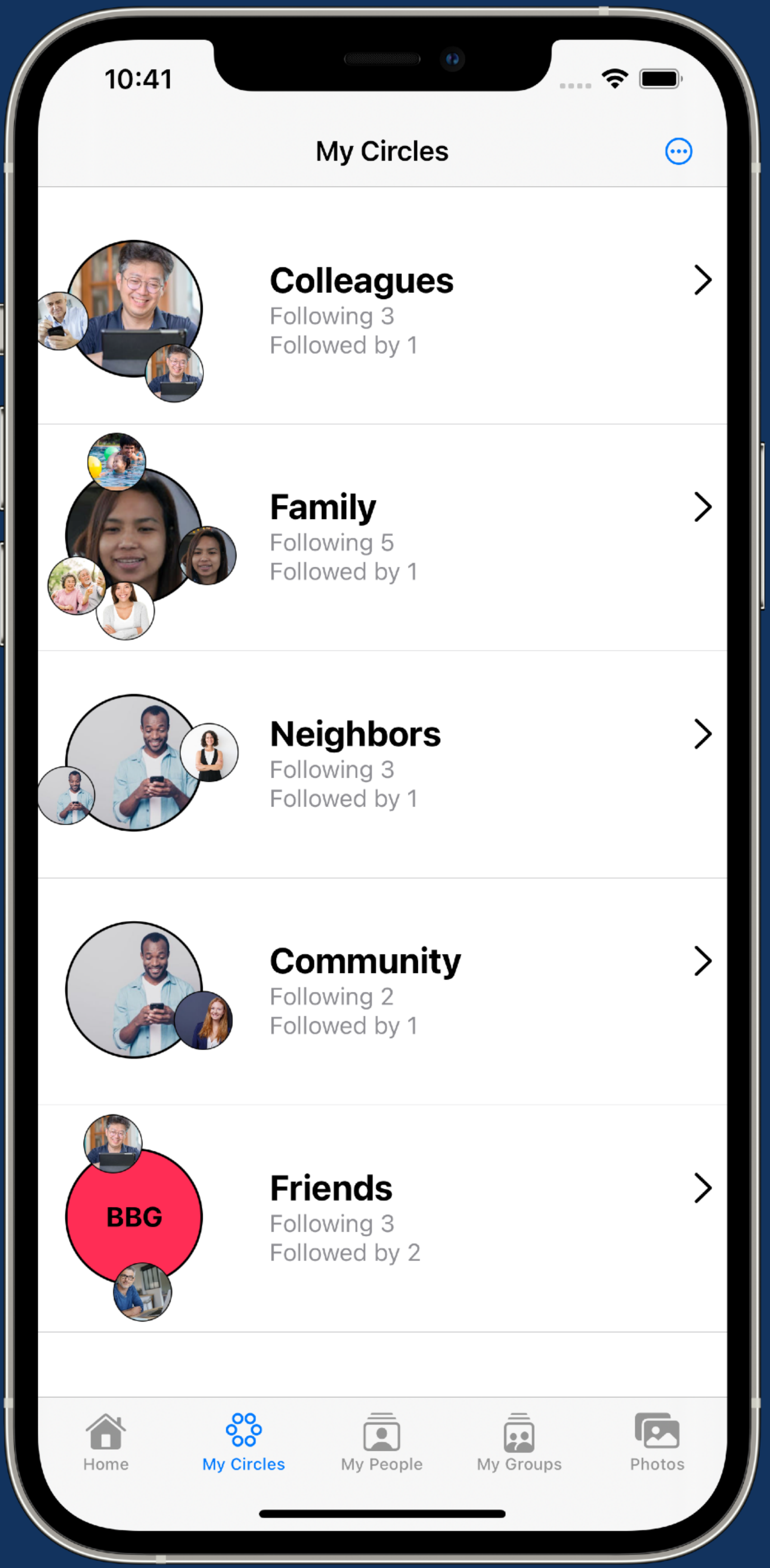
Focus on enabling real human relationships between real people

Facebook has become a ghost town
(See the “Dead Internet Theory”)

Normal families are stuck using
SMS and email like it’s 2003

Circles

- **Social network in the front**
  - Easy
  - Convenient
  - Familiar
- **Matrix in the back**
  - Encrypted
  - Federated
  - Open standards
  - Open source



10:41

My Circles

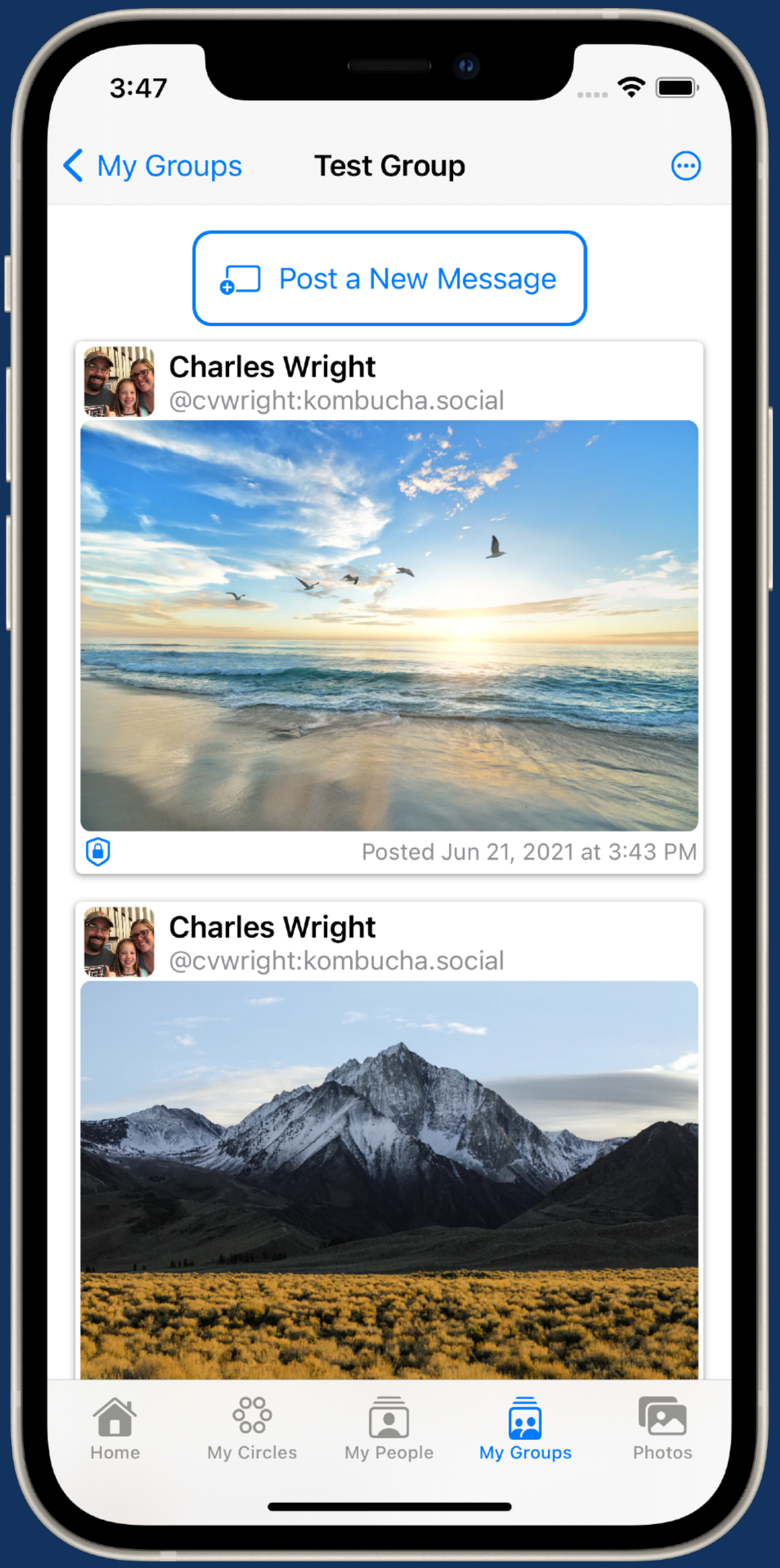
Colleagues
Following 3
Followed by 1

Family
Following 5
Followed by 1

Neighbors
Following 3
Followed by 1

Community
Following 2
Followed by 1

Friends
Following 3
Followed by 2



3:47

My Groups

Test Group

Post a New Message

Charles Wright
@cvwright:kombucha.social

Posted Jun 21, 2021 at 3:43 PM

Charles Wright
@cvwright:kombucha.social

Challenges

- **Challenge 1: Mapping human social structures onto Matrix**
  - Groups
  - Friends
- **Challenge 2: Balancing privacy and ease of use**
  - Discoverability vs Privacy
  - Making SSSS easier for users

Challenges

- **Challenge 1: Mapping human social structures onto Matrix**
  - Groups
  - Friends

Focus of this talk

- **Challenge 2: Balancing privacy and ease of use**
  - Discoverability vs Privacy
  - Making SSSS easier for users

Social Structures

Friendships and similar relationships

- Flexible, harder to define
- *Asymmetric — Not everyone is connected in the same ways*

Groups

- Well-defined membership
- Everyone is connected to each other

Social Structures: Private Groups

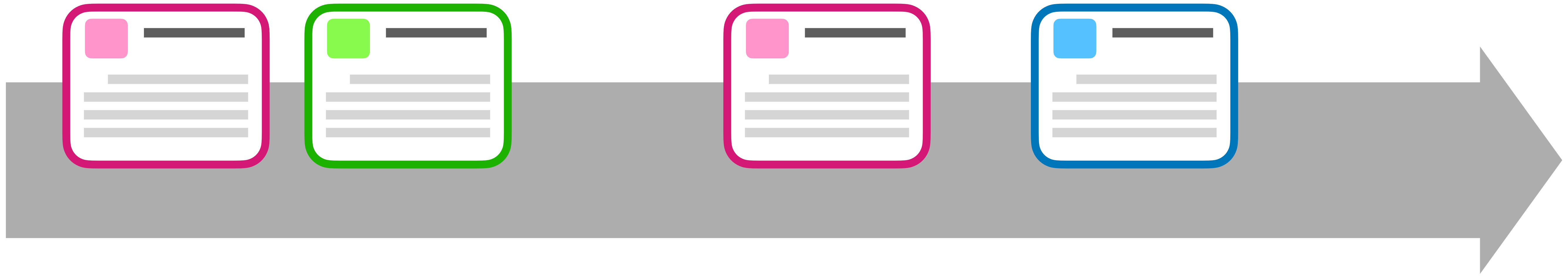
Mapping this structure onto Matrix: Easy Mode

Insight: It’s just a chat room with a different (async / social) UI!

Solution: Create **one Matrix room** for the whole group

Social Structures: Private Groups

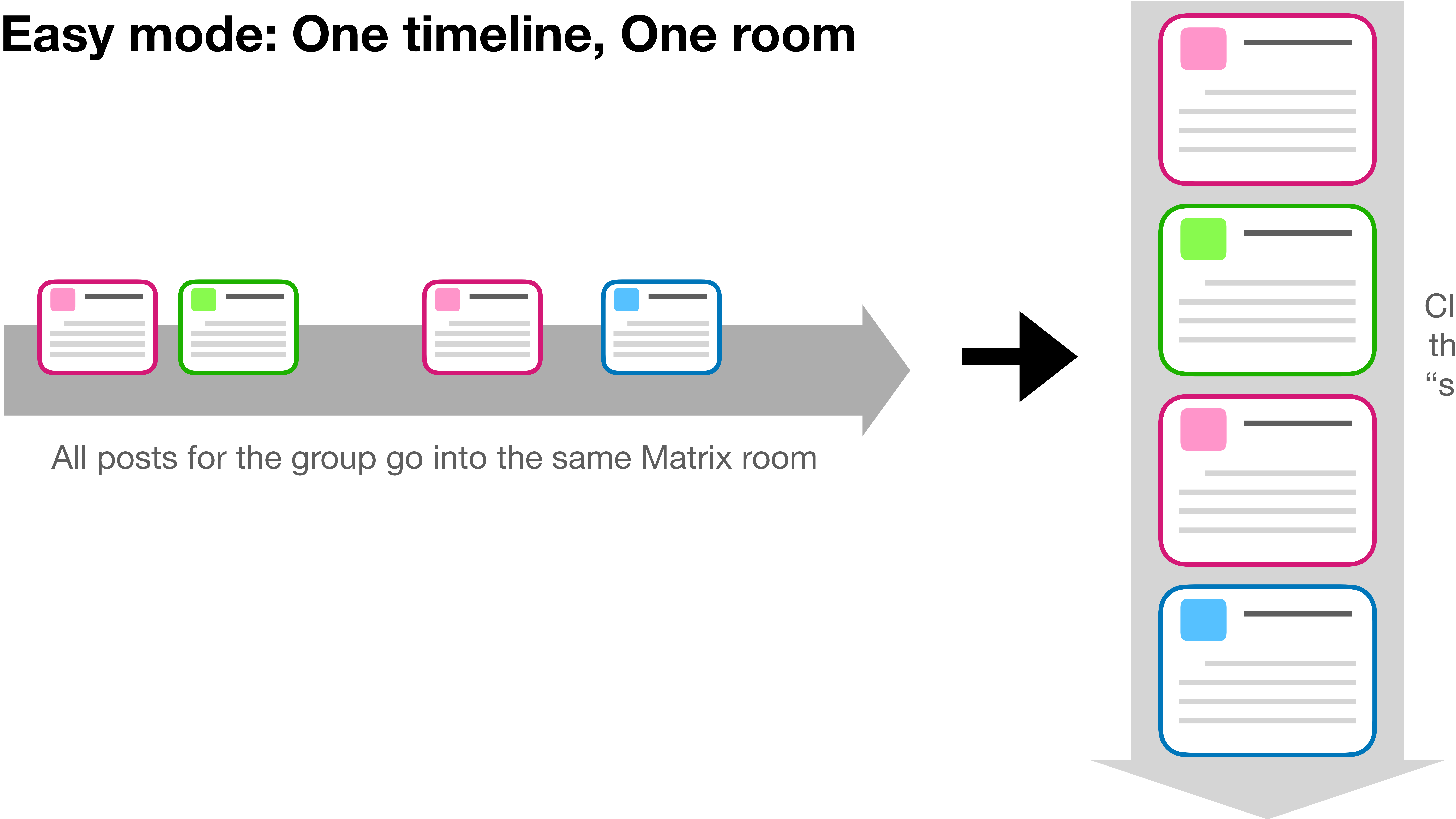
Easy mode: One timeline, One room



All posts for the group go into the same Matrix room

Social Structures: Private Groups

Easy mode: One timeline, One room



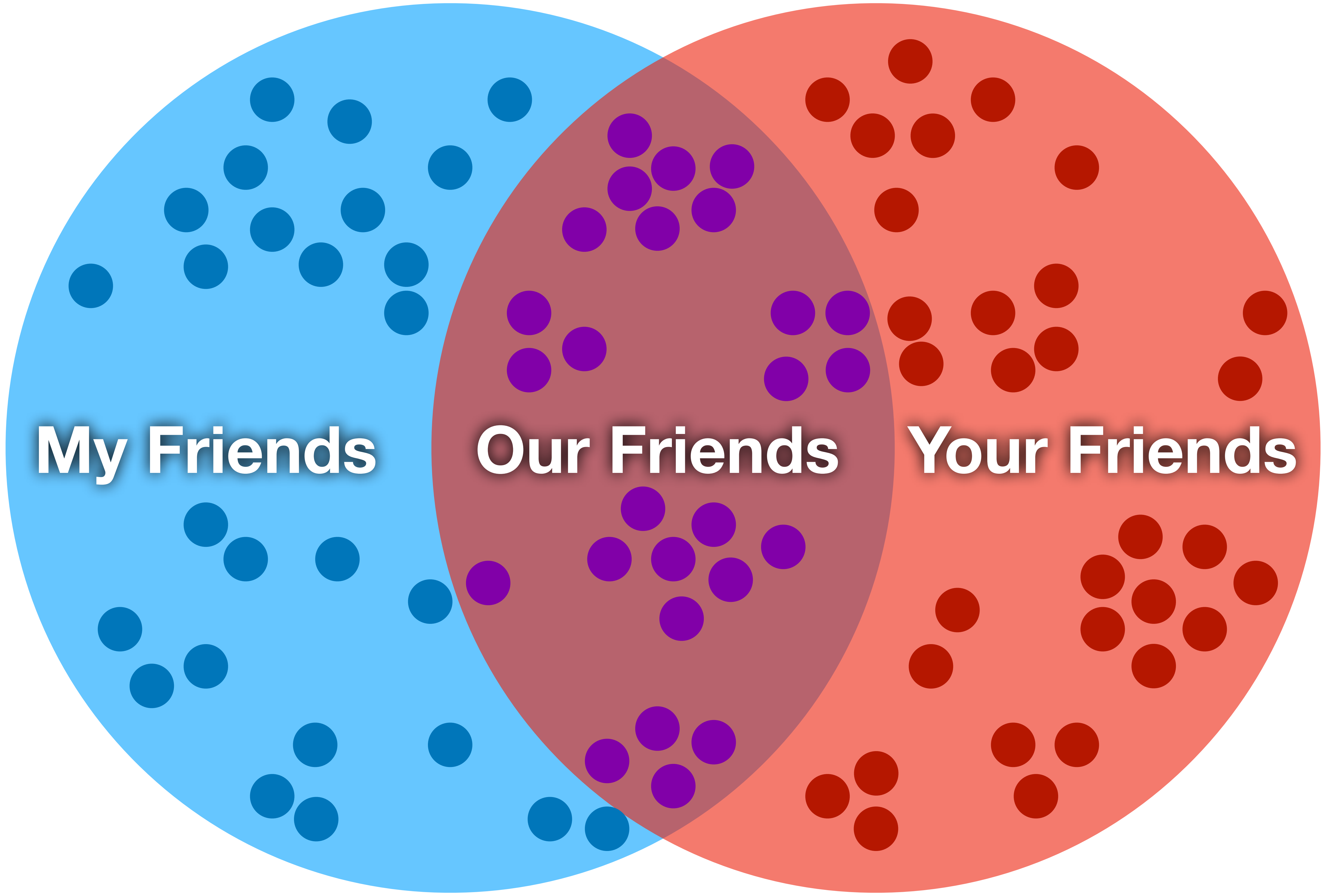
All posts for the group go into the same Matrix room

Client renders the events as “social” posts

Social Structures: Secure Social Circles

Mapping human connections onto Matrix rooms

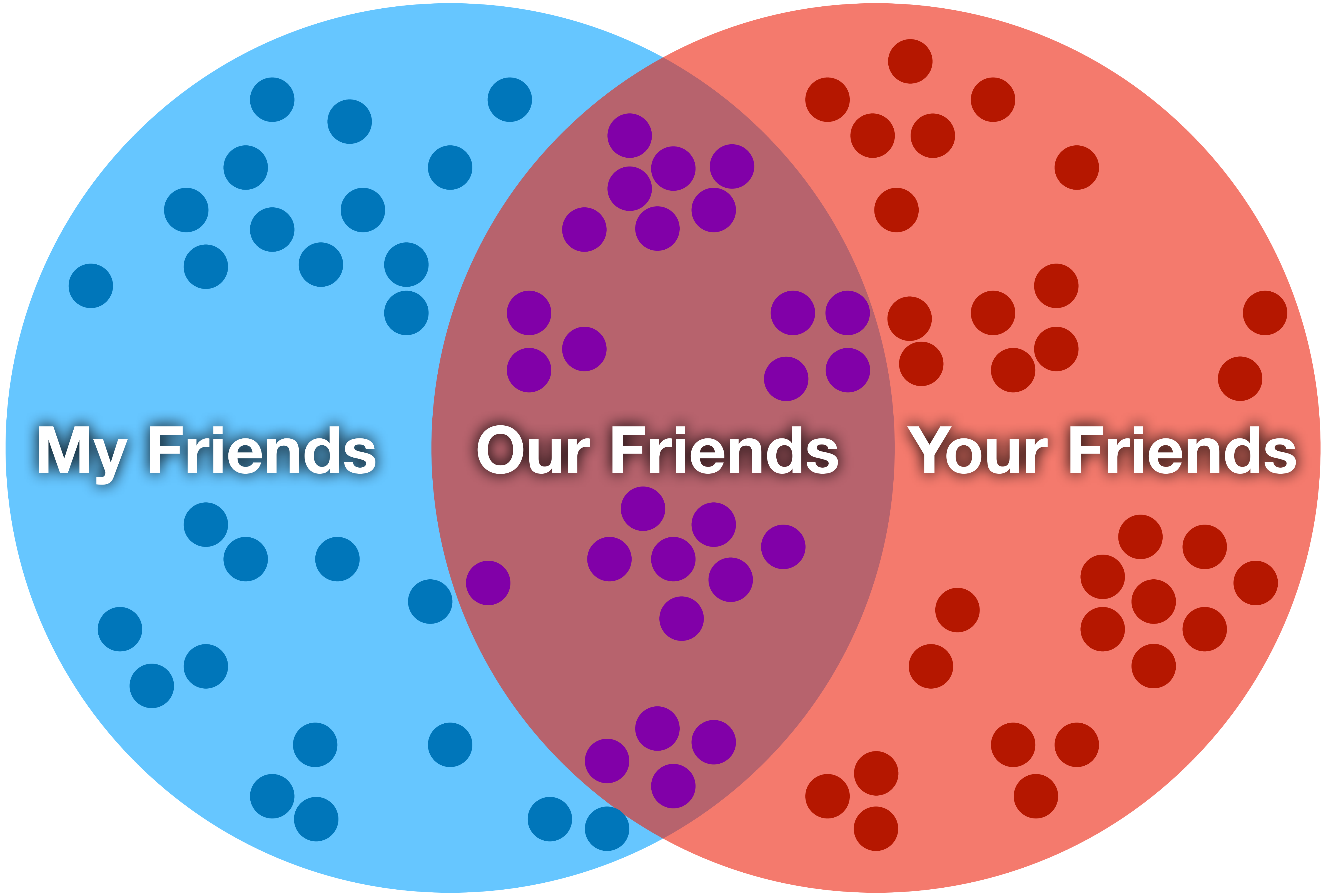
- Challenge: Friend relationship structures are asymmetric, non-transitive



Social Structures: Secure Social Circles

Mapping human connections onto Matrix rooms

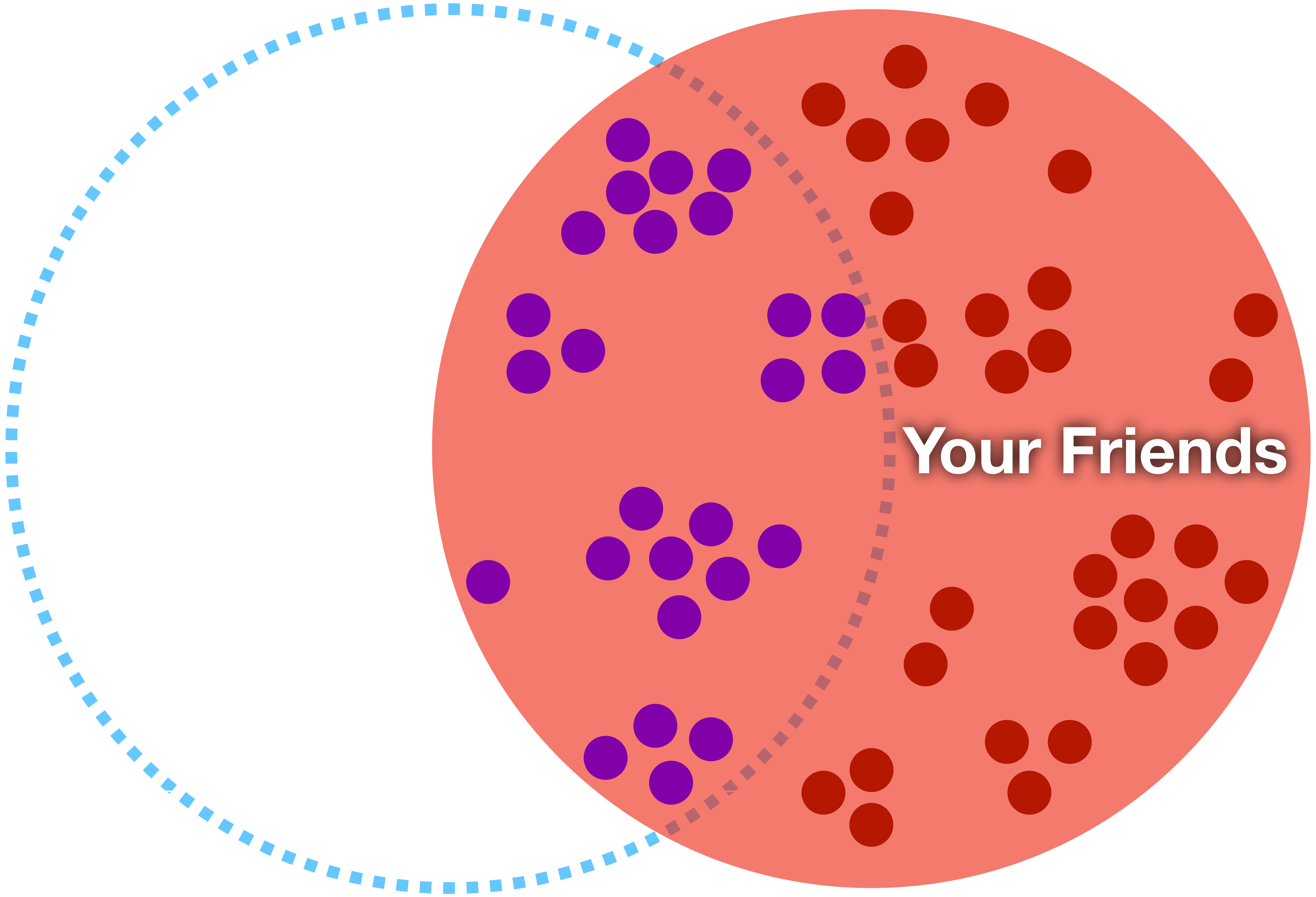
- Insight: DON'T PUT EVERYONE INTO THE SAME ROOM!



Social Structures: Secure Social Circles

Mapping human connections onto Matrix rooms

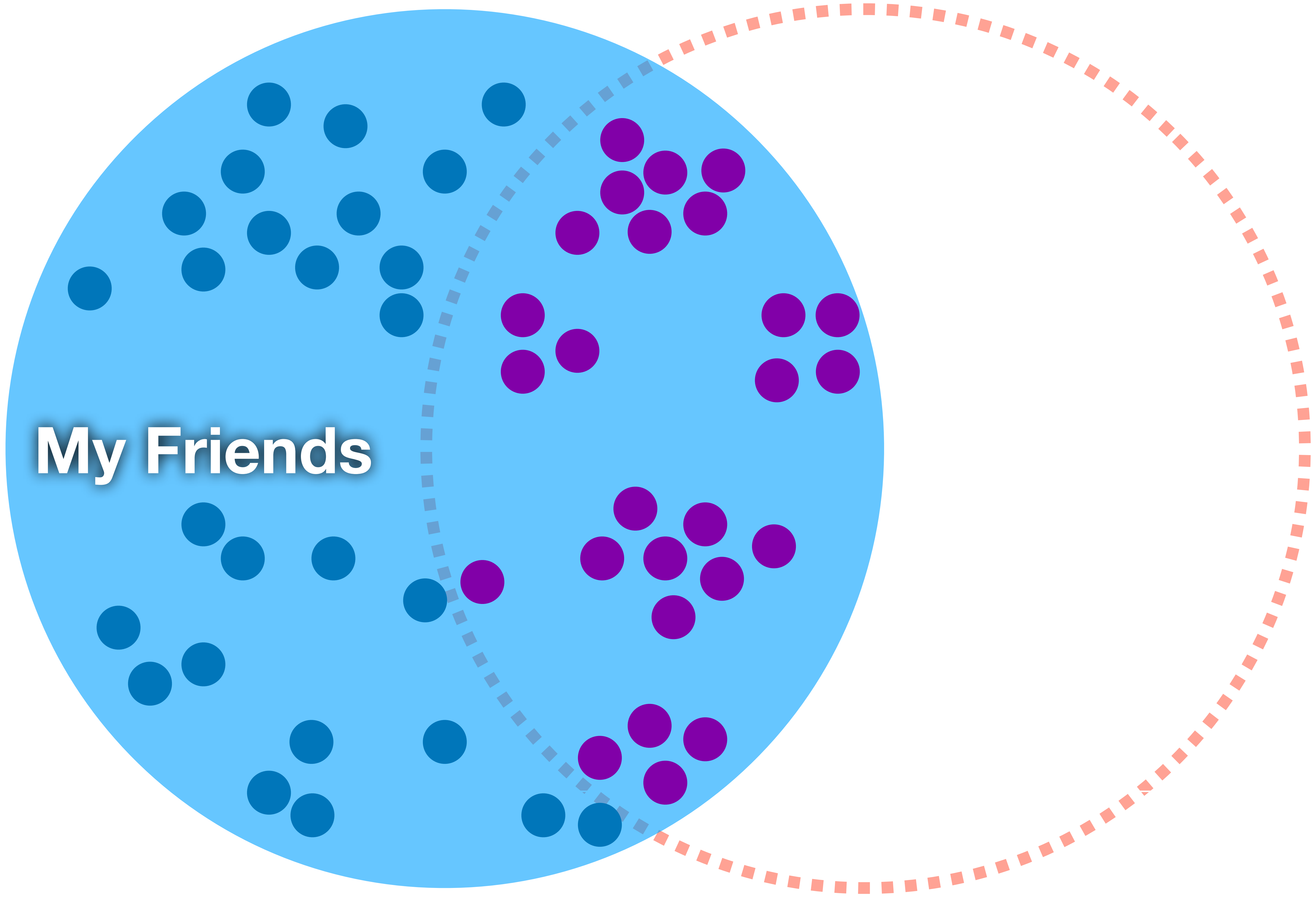
- Your friends want to see updates from you — They go in one room



Social Structures: Secure Social Circles

Mapping human connections onto Matrix rooms

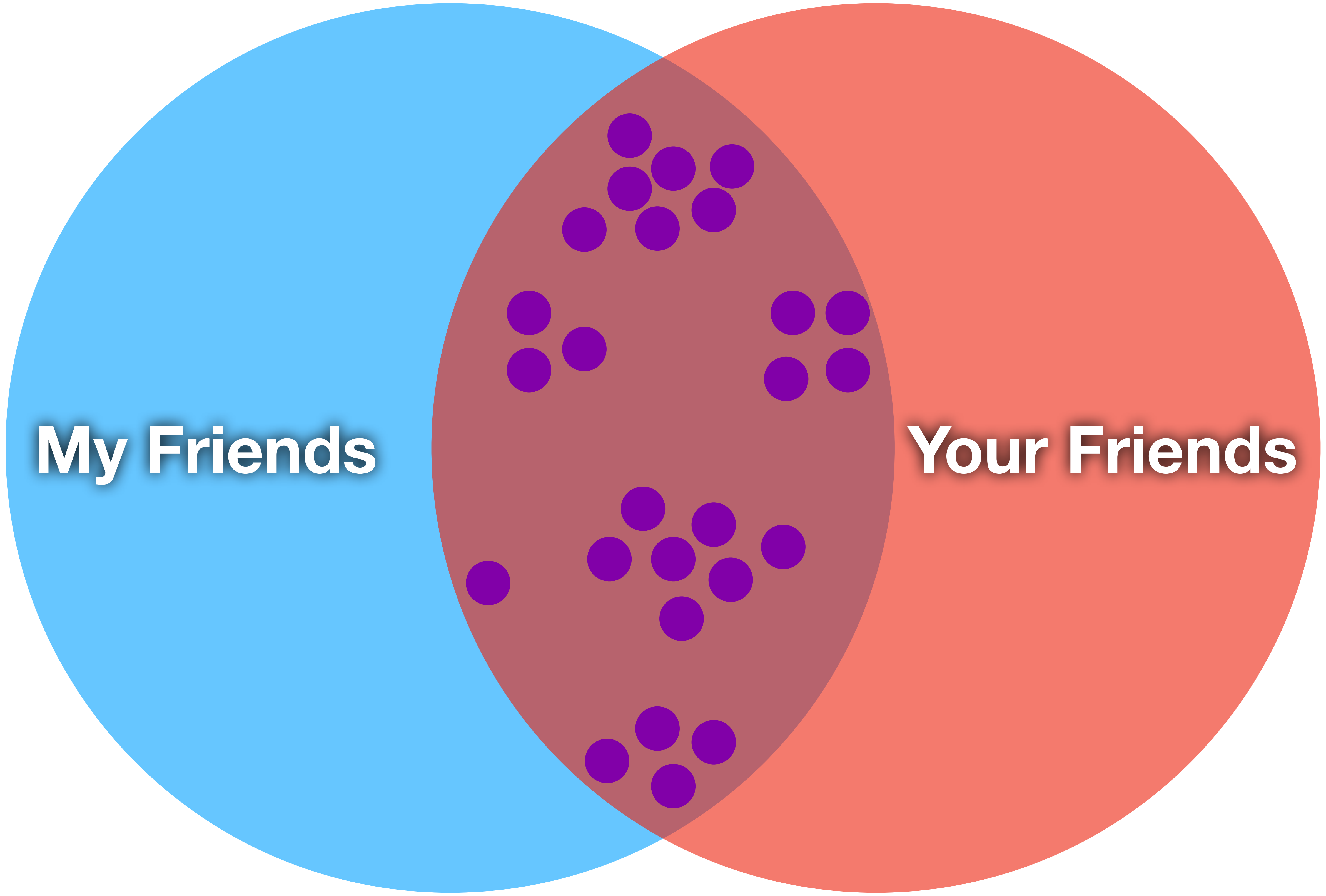
- My friends want to see updates from me — They go in a different room



Social Structures: Secure Social Circles

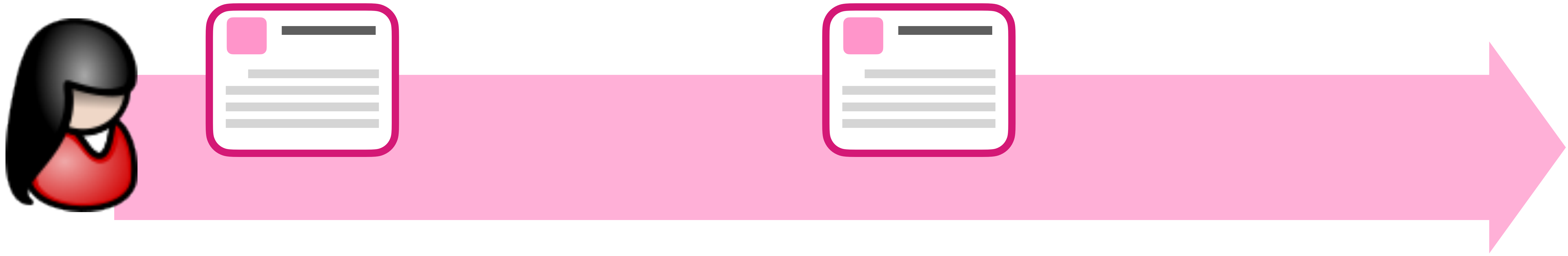
Mapping human connections onto Matrix rooms

- Our mutual friends should be members of both rooms



Social Structures: Secure Social Circles

Mapping human connections onto Matrix rooms

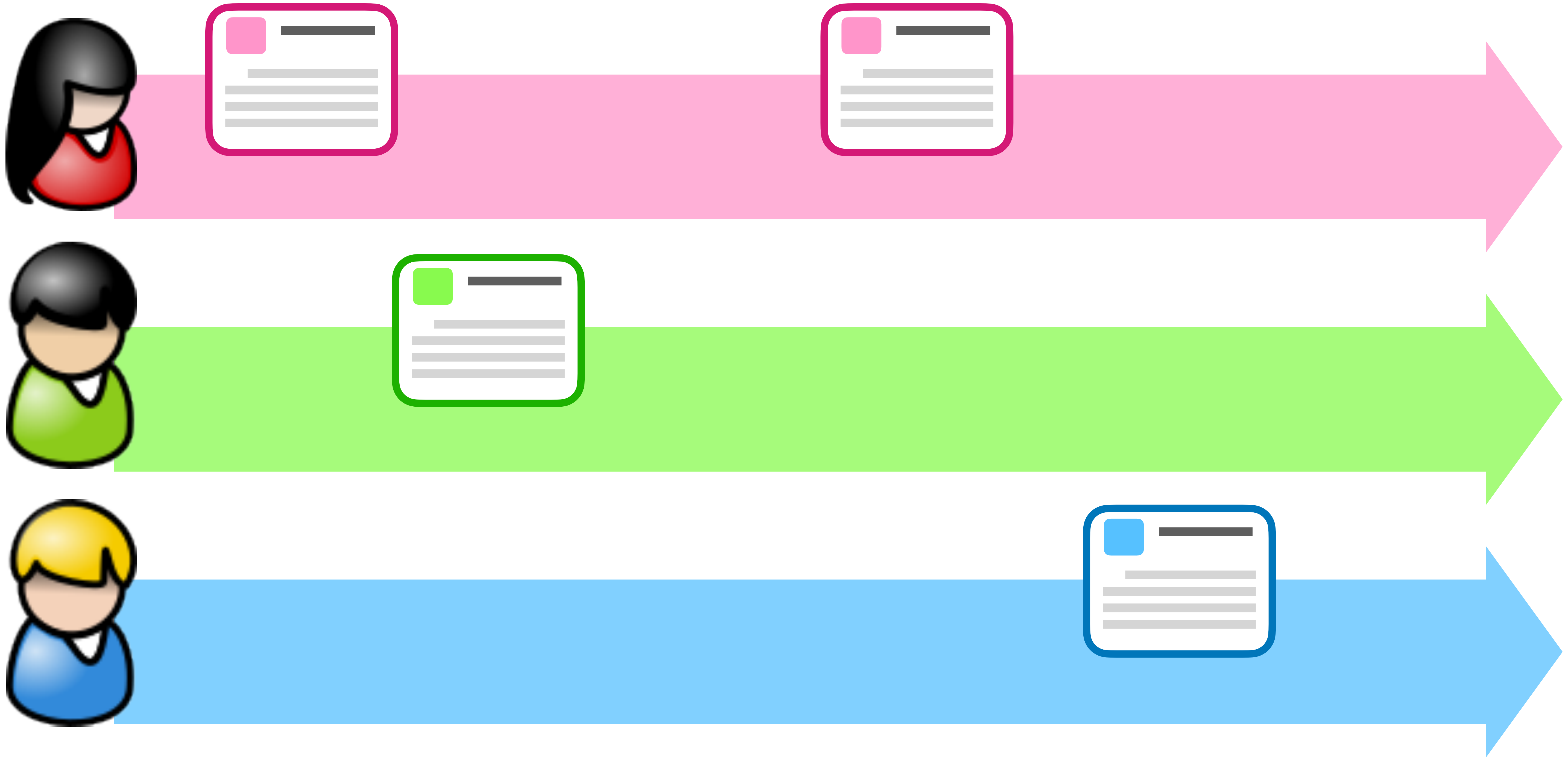


- Solution: Create one Matrix room for each person
  - Owner posts their updates in the room
  - Other users (“followers”) mostly only read *

*One common exception to the rule: Posting “Happy Birthday!!” in a friend’s room

Social Structures: Secure Social Circles

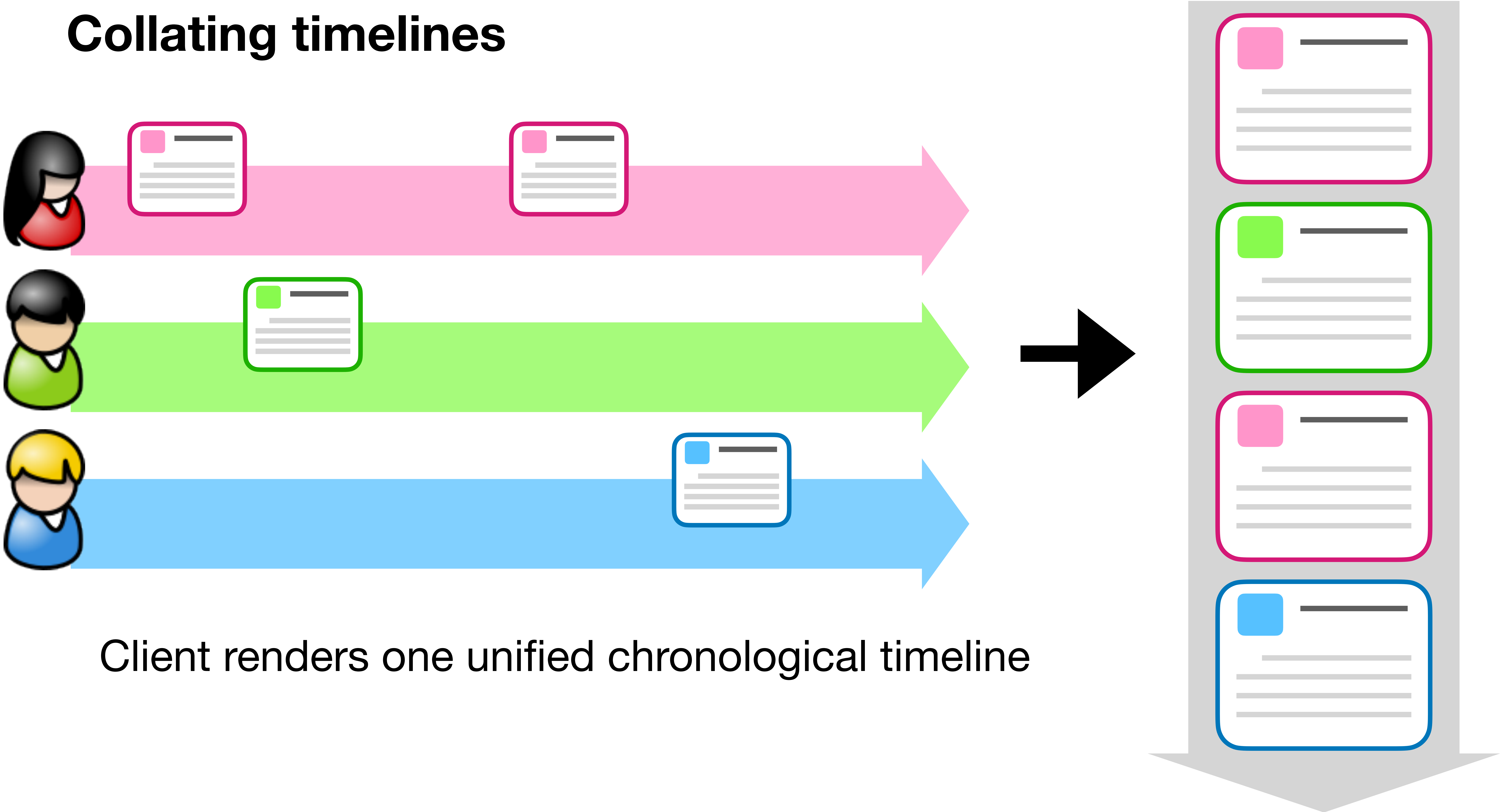
Mapping human connections onto Matrix rooms



Client fetches and collates events from all of your friends’ rooms

Social Structures: Secure Social Circles

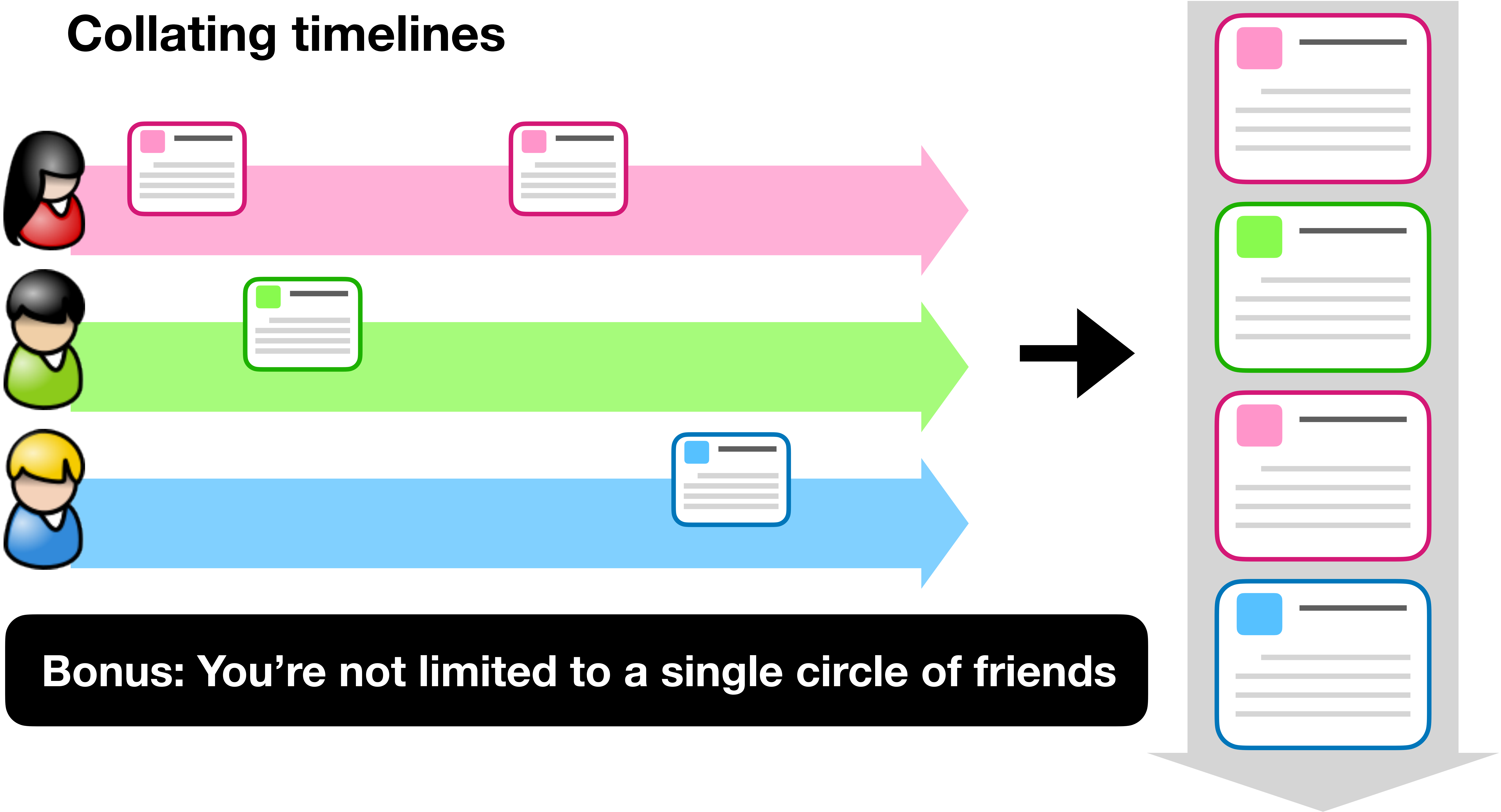
Collating timelines



Client renders one unified chronological timeline

Social Structures: Secure Social Circles

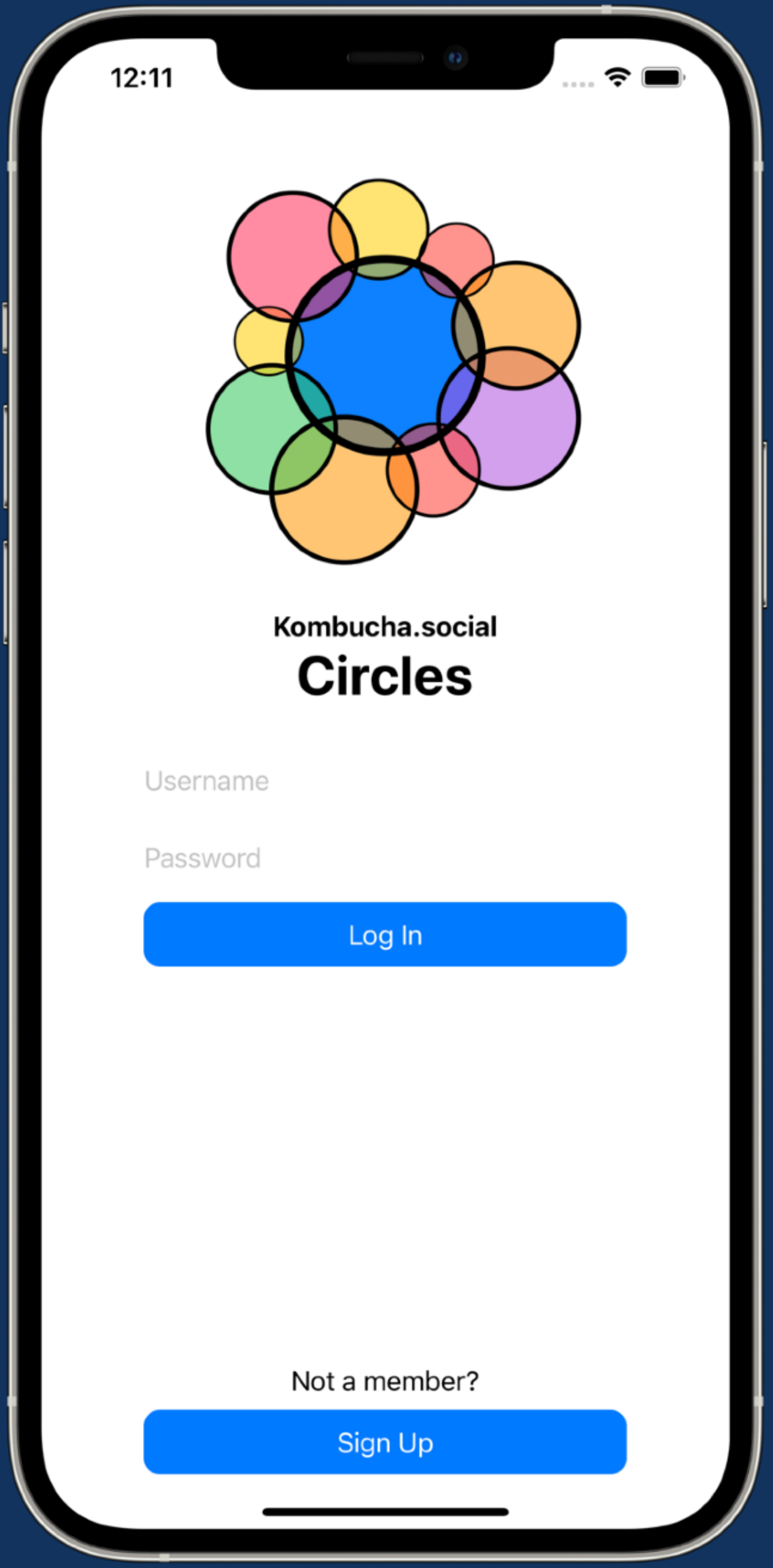
Collating timelines

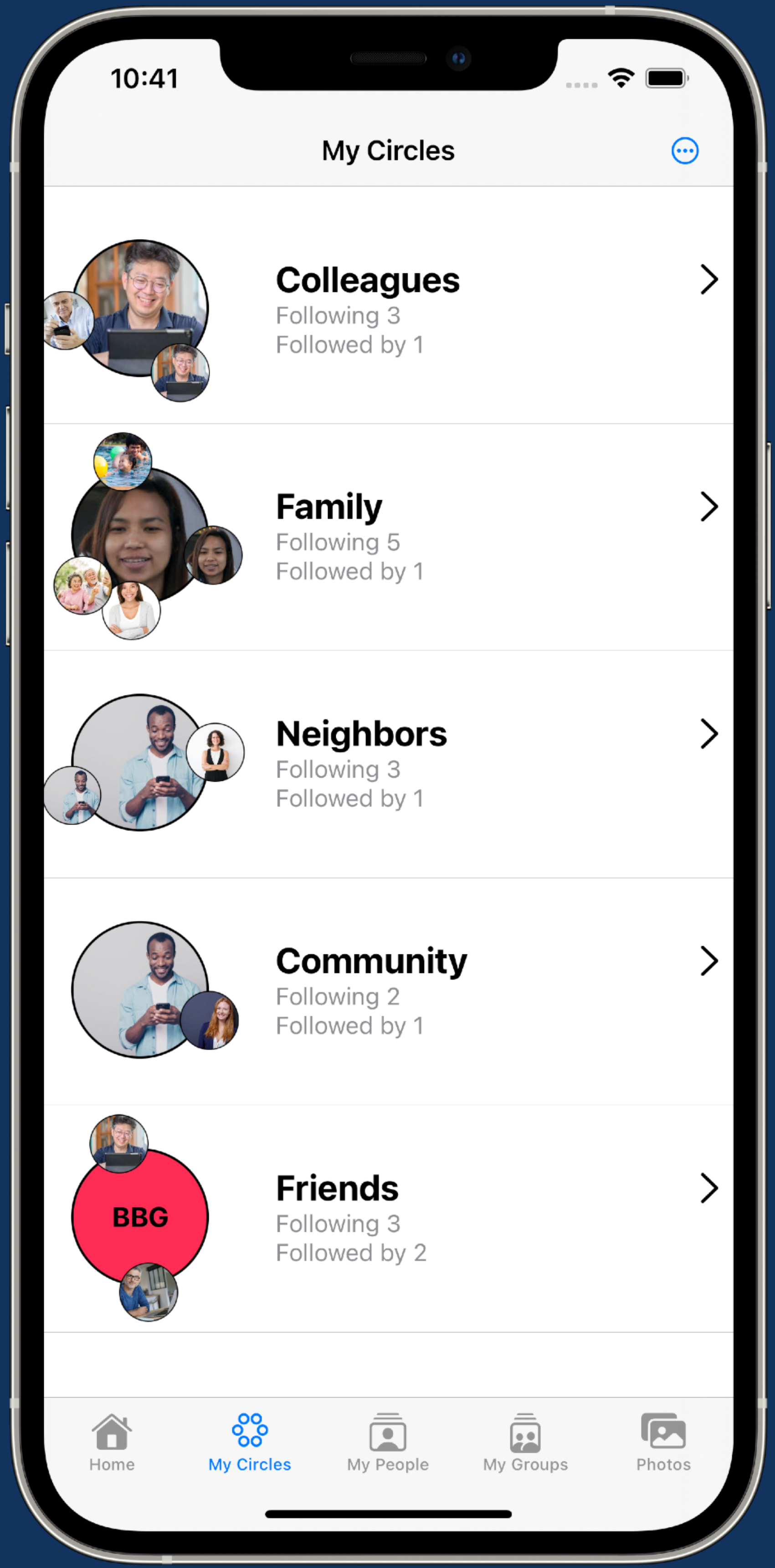


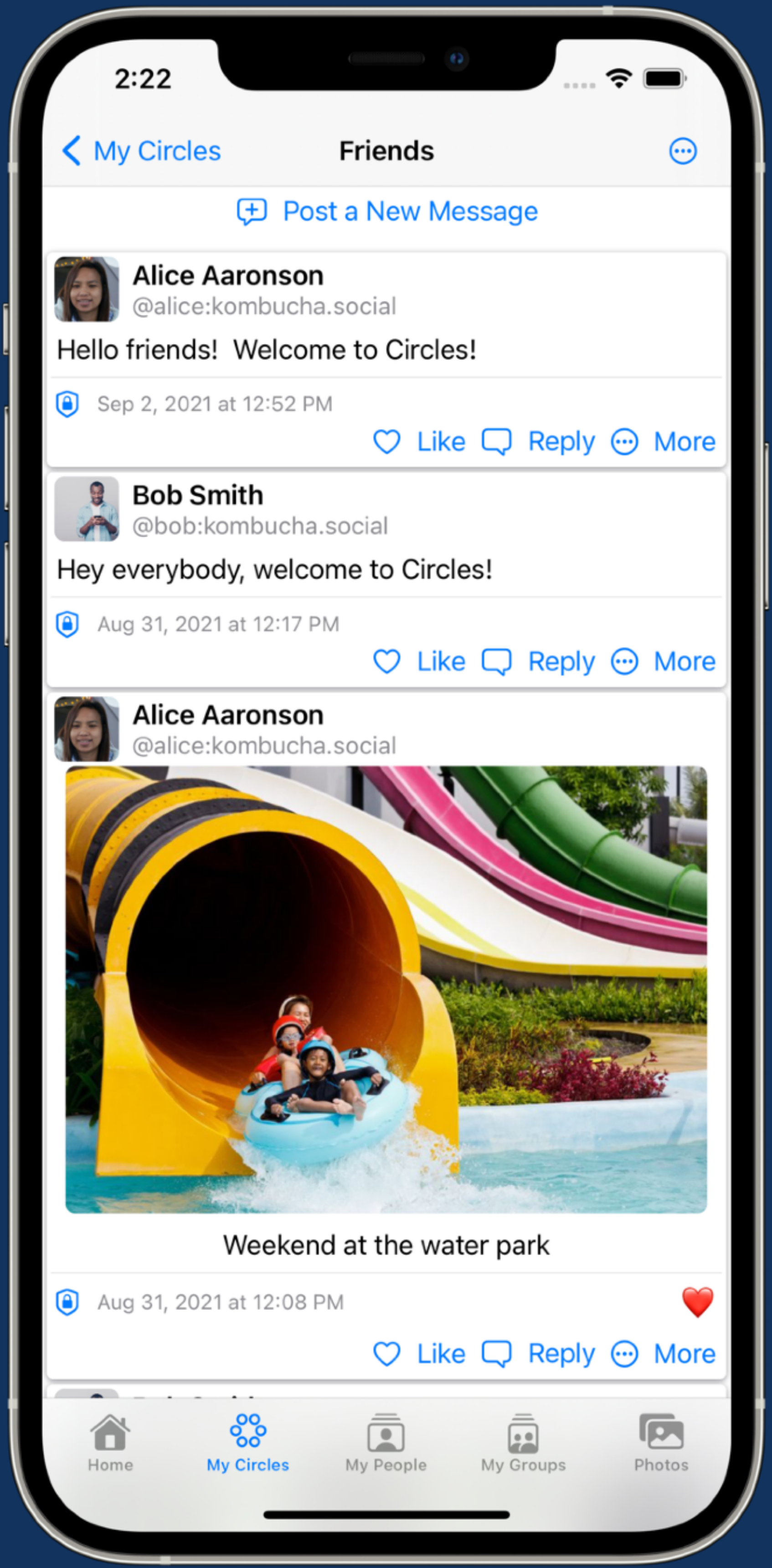
Bonus: You're not limited to a single circle of friends

FUTO Circles on iOS

Beta is paused while we re-write the SDK… Coming back soon!



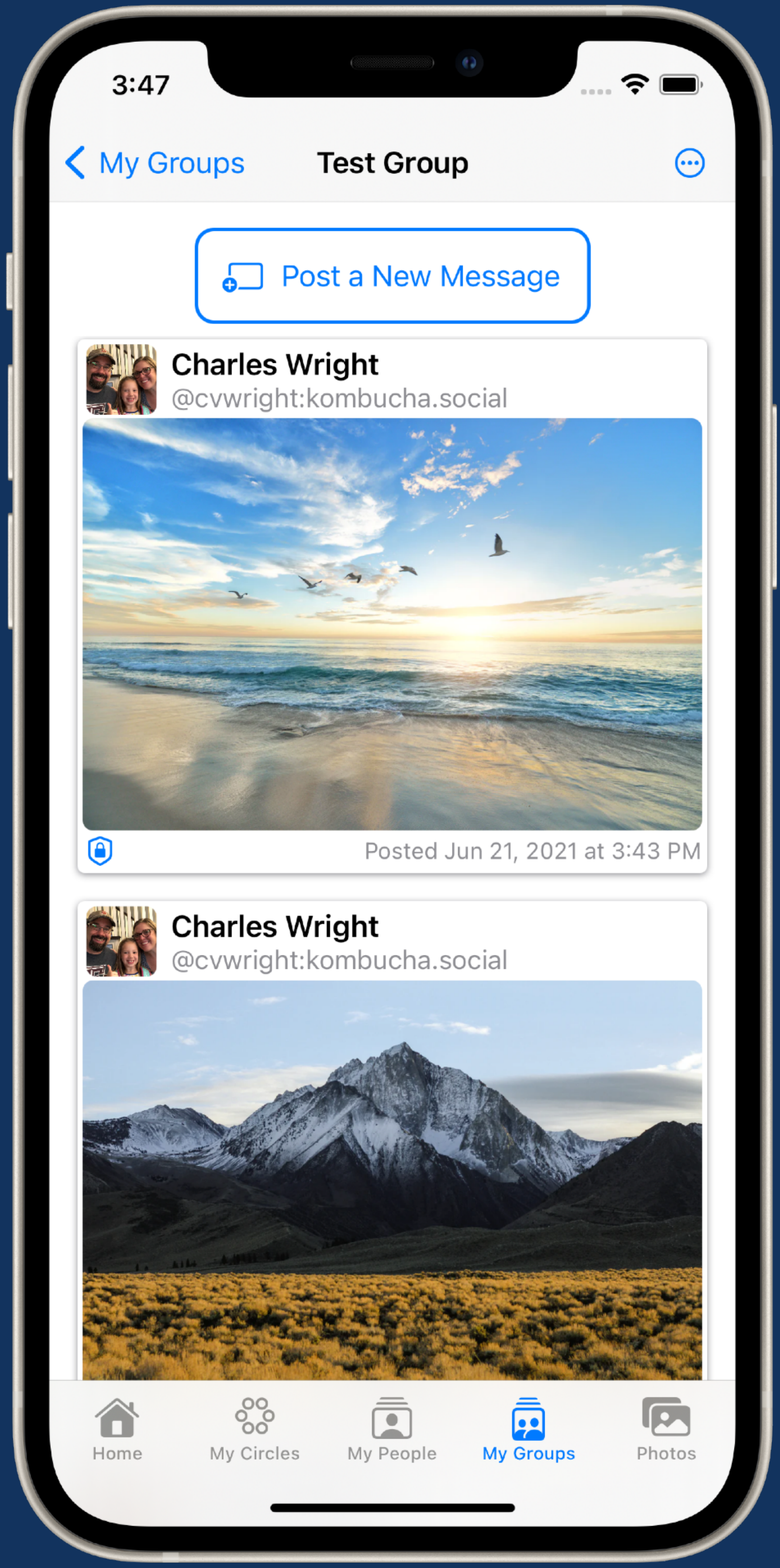




Alice Aaronson
@alice:kombucha.social
Hello friends! Welcome to Circles!
Sep 2, 2021 at 12:52 PM

Bob Smith
@bob:kombucha.social
Hey everybody, welcome to Circles!
Aug 31, 2021 at 12:17 PM

Alice Aaronson
@alice:kombucha.social
Weekend at the water park
Aug 31, 2021 at 12:08 PM



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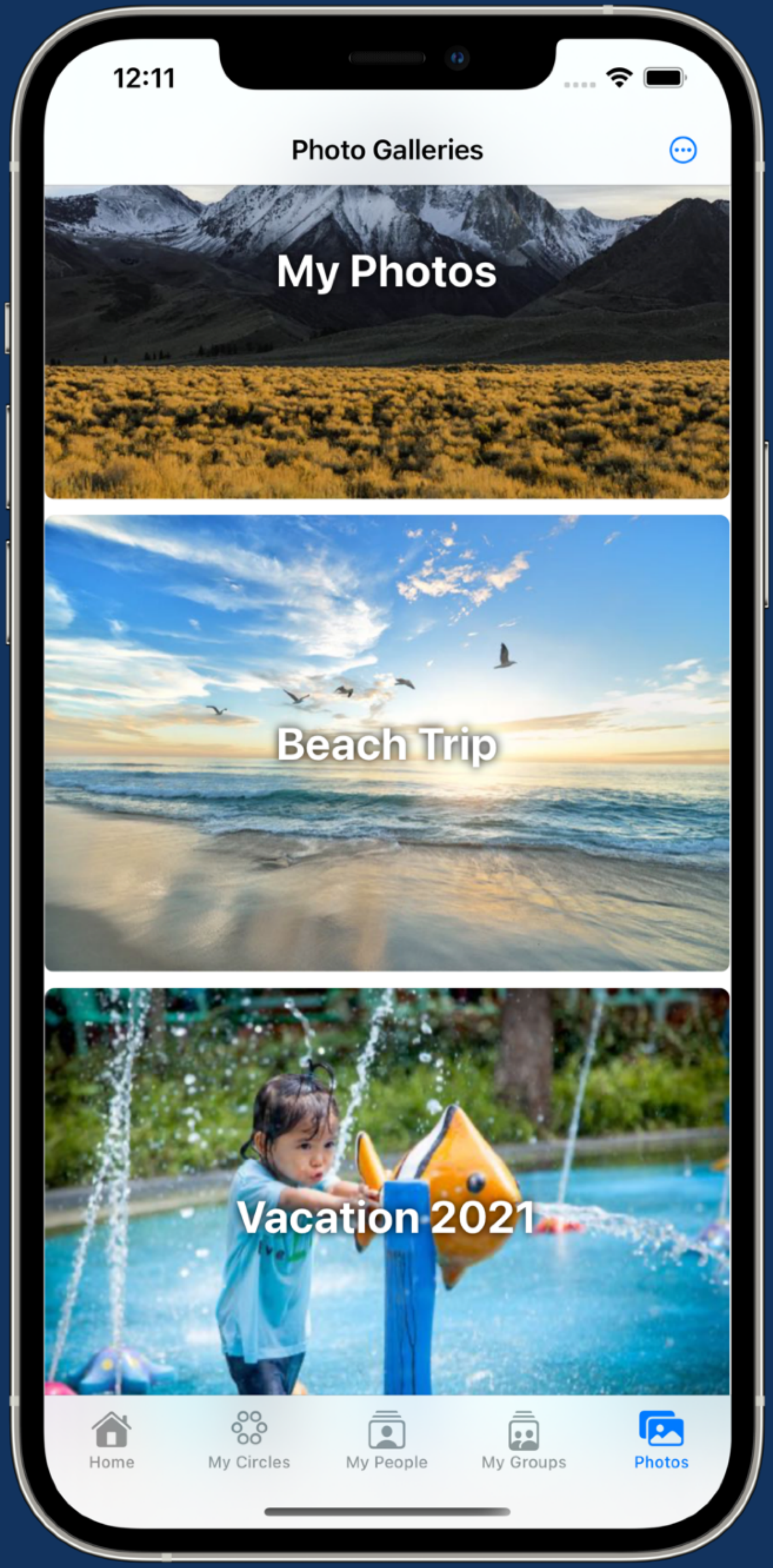
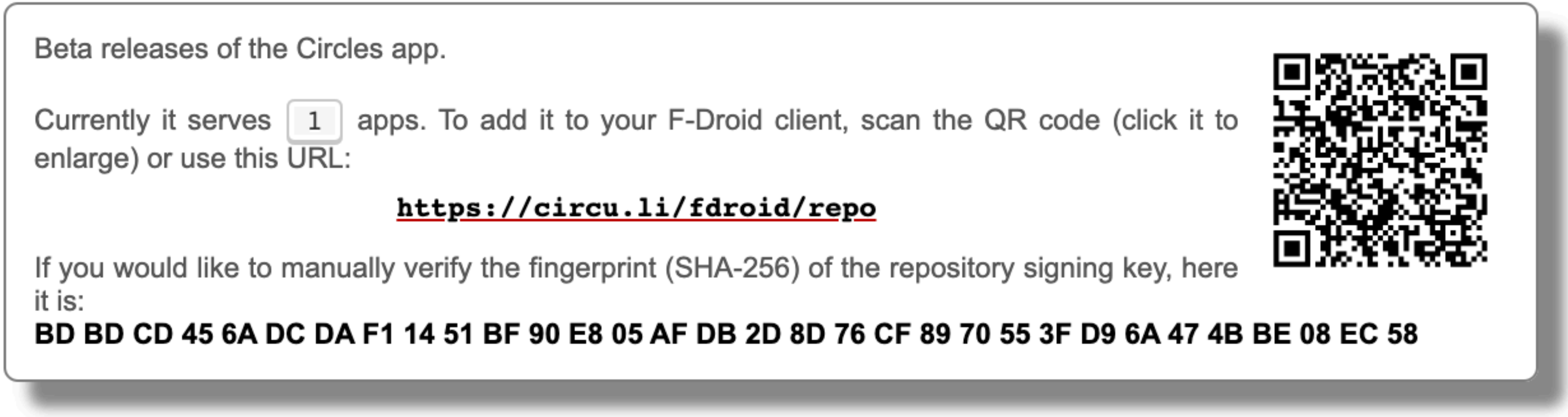


FUTO Circles for Android

Now in beta on Google Play and in our F-Droid repo



Circles beta repo

Beta releases of the Circles app.

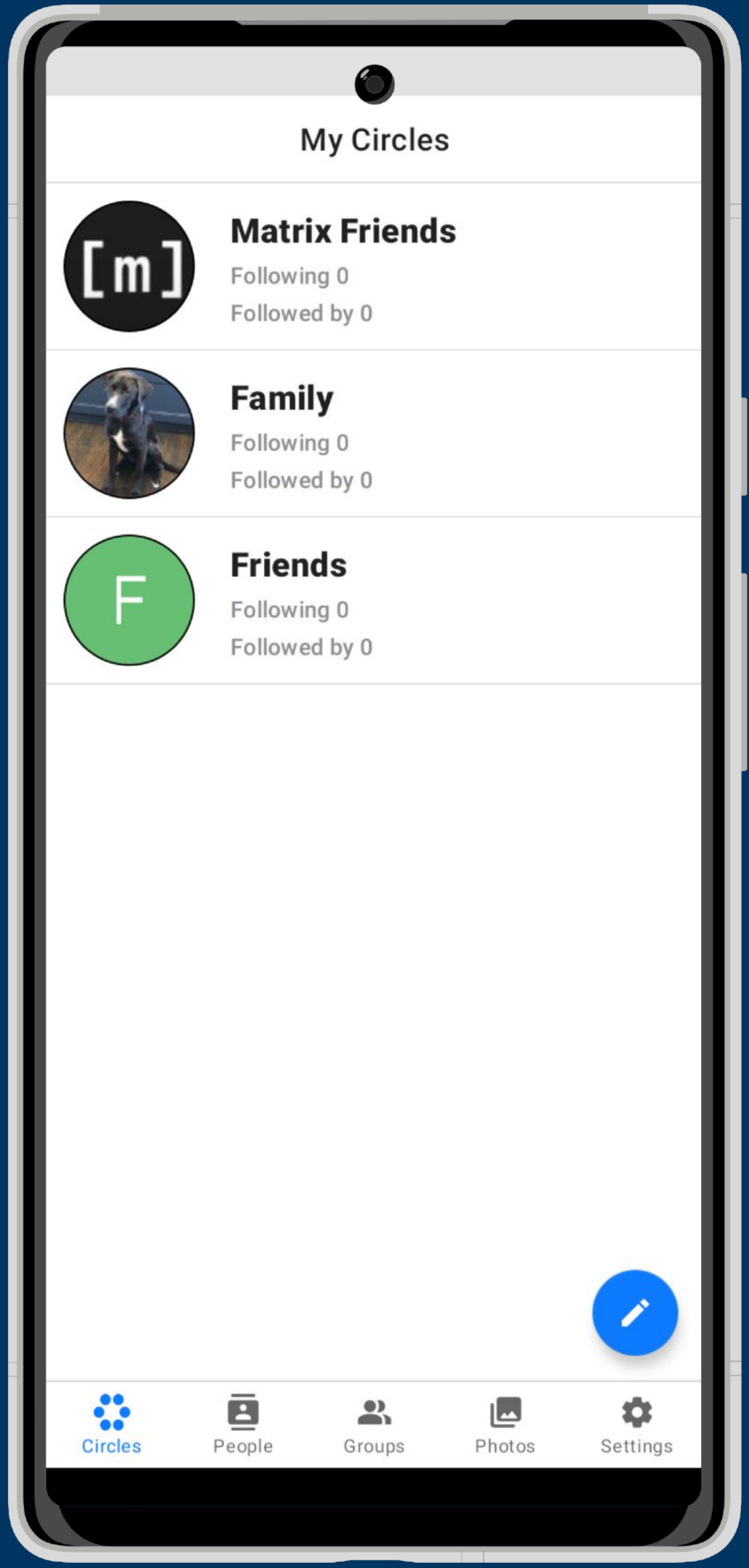
Currently it serves 1 apps. To add it to your F-Droid client, scan the QR code (click it to enlarge) or use this URL:

https://circu.li/fdroid/repo

If you would like to manually verify the fingerprint (SHA-256) of the repository signing key, here it is:

BD BD CD 45 6A DC DA F1 14 51 BF 90 E8 05 AF DB 2D 8D 76 CF 89 70 55 3F D9 6A 47 4B BE 08 EC 58

Android Screenshots

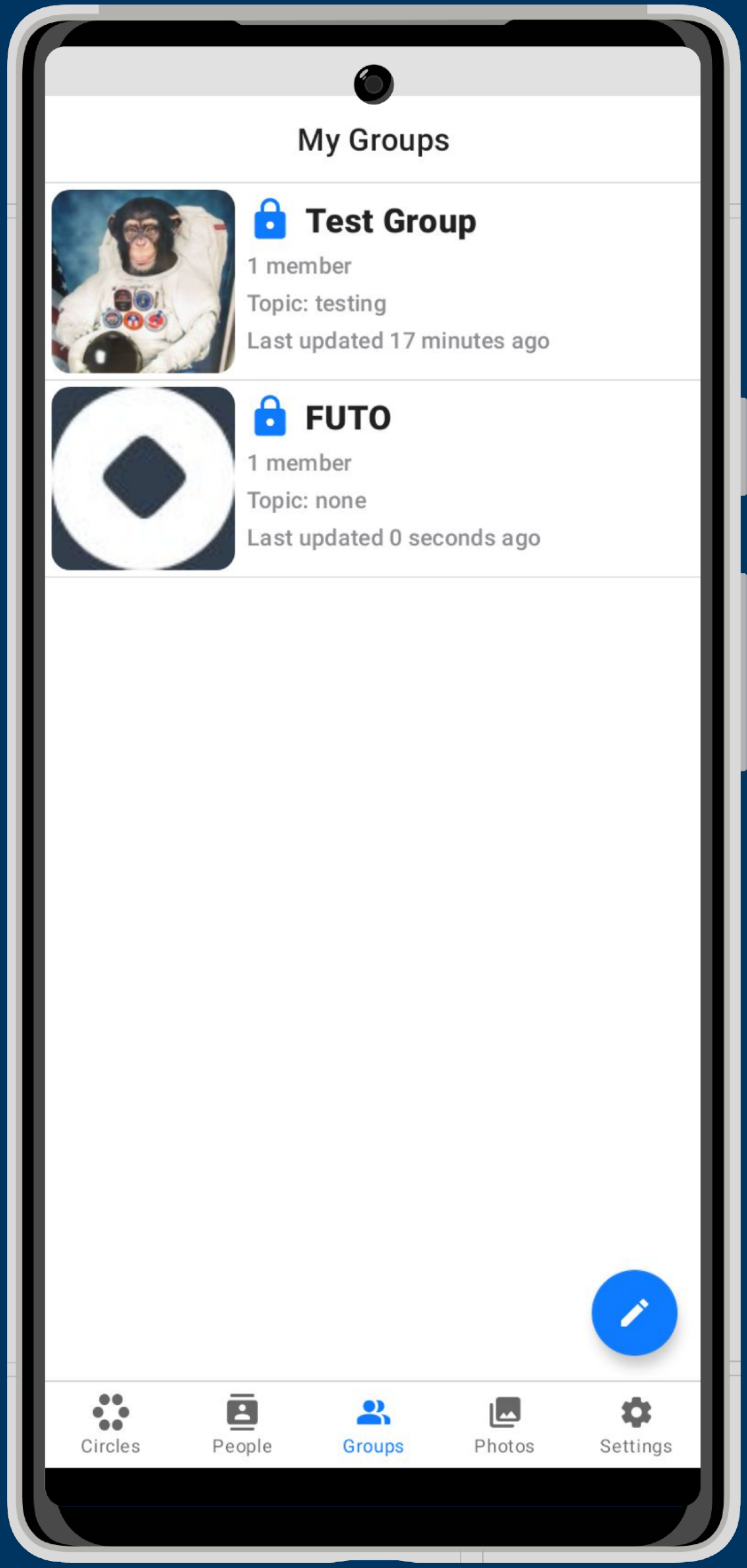


My Circles

Matrix Friends
Following 0
Followed by 0

Family
Following 0
Followed by 0

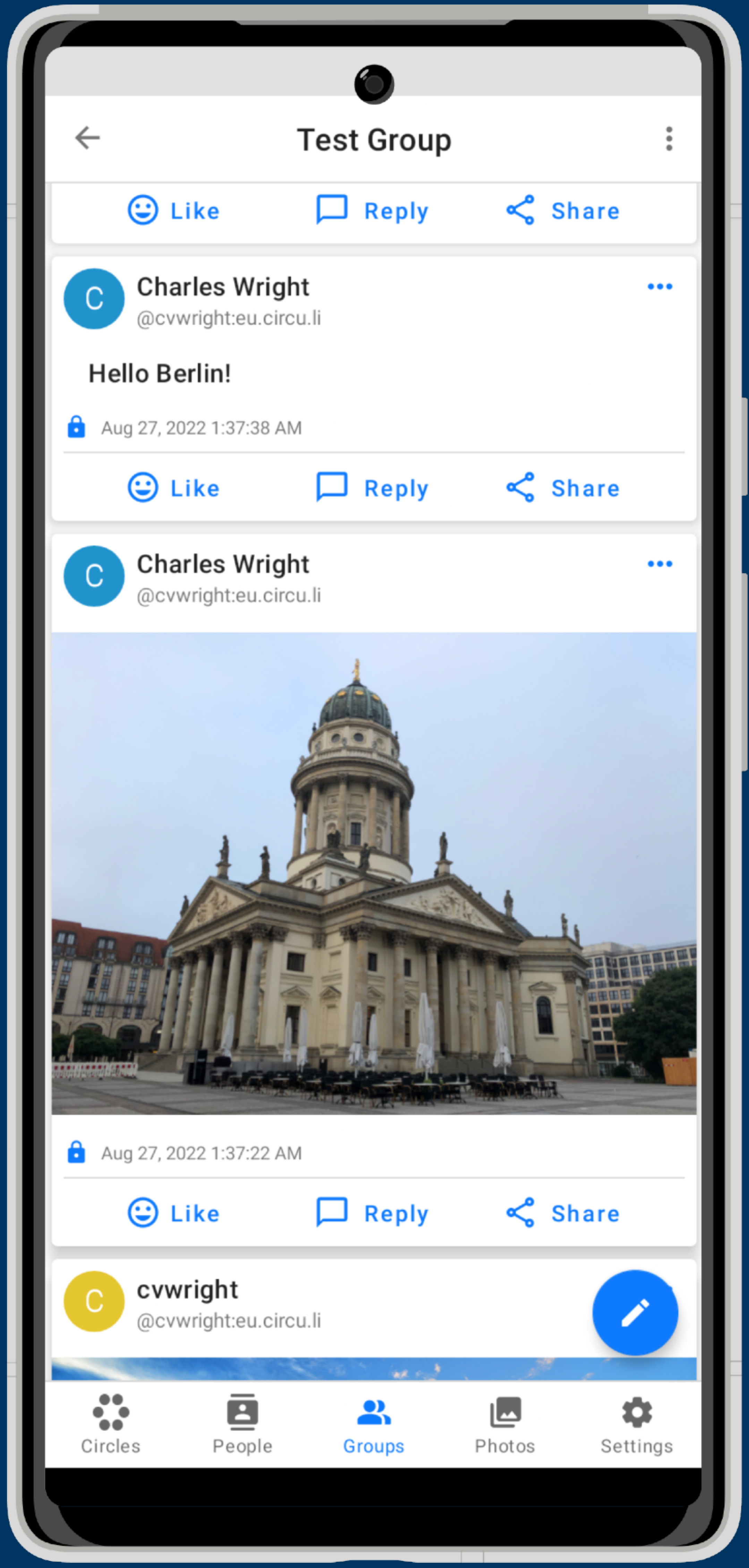
Friends
Following 0
Followed by 0



My Groups

Test Group
1 member
Topic: testing
Last updated 17 minutes ago

FUTO
1 member
Topic: none
Last updated 0 seconds ago



Test Group

Charles Wright
@cvwright:eu.circu.li

Hello Berlin!

Aug 27, 2022 1:37:38 AM

Charles Wright
@cvwright:eu.circu.li

Aug 27, 2022 1:37:22 AM

cvwright
@cvwright:eu.circu.li

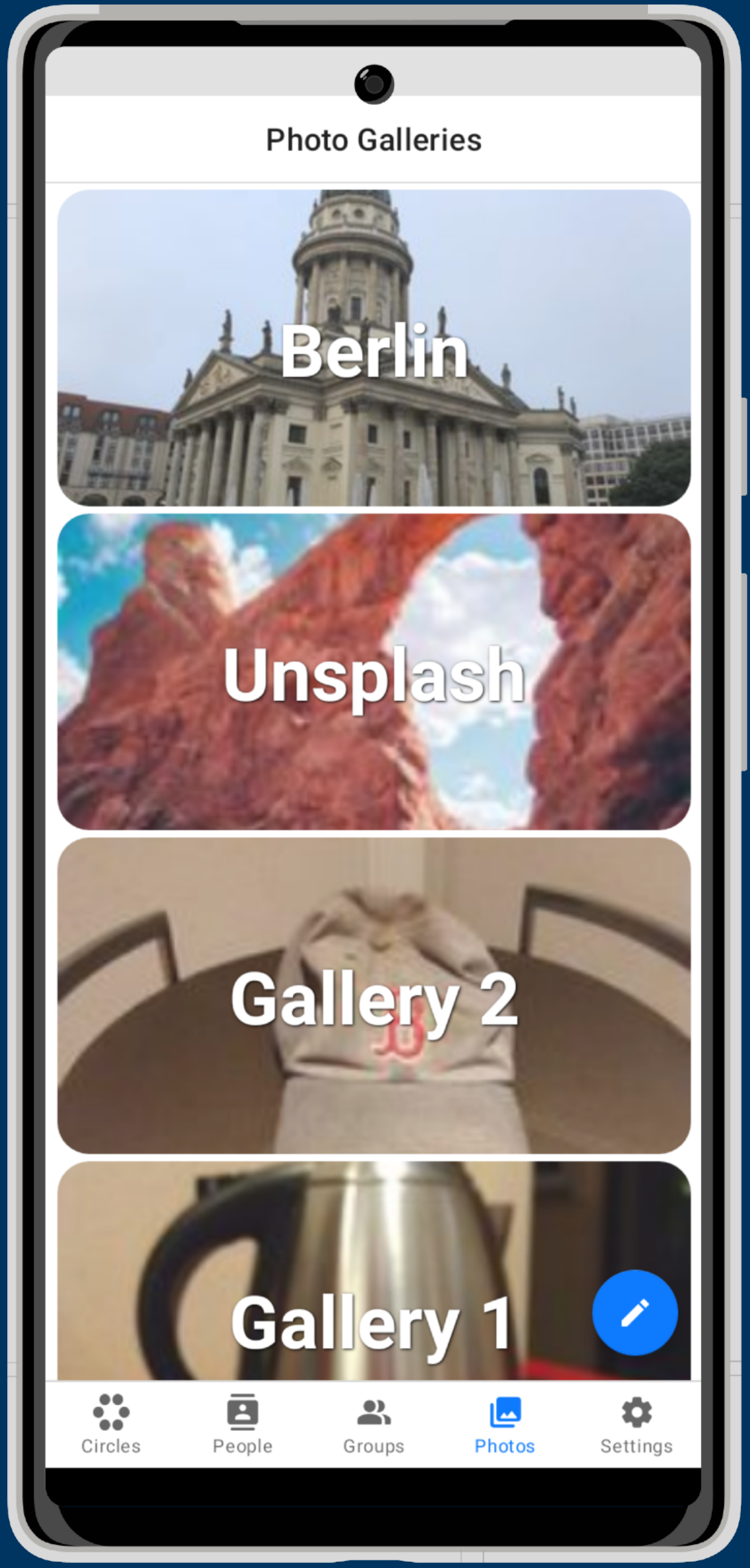


Photo Galleries

Future Work

New features in progress

- Profiles as spaces — Making discoverability easier
- Notifications

Plans for 2023

- Another round of public beta test on Android and iOS
- Support for MSC3917: Cryptographically Constrained Room Membership
- In-app subscriptions via Google and Apple — Hosted accounts for a few $/mo
- **Production release on both platforms**
- Growth! 🚀

Thanks!

Follow the project: #circles:matrix.org

Get the code:

https://gitlab.futo.org/circles/circles-ios
https://gitlab.futo.org/circles/circles-android

Try the Android beta: