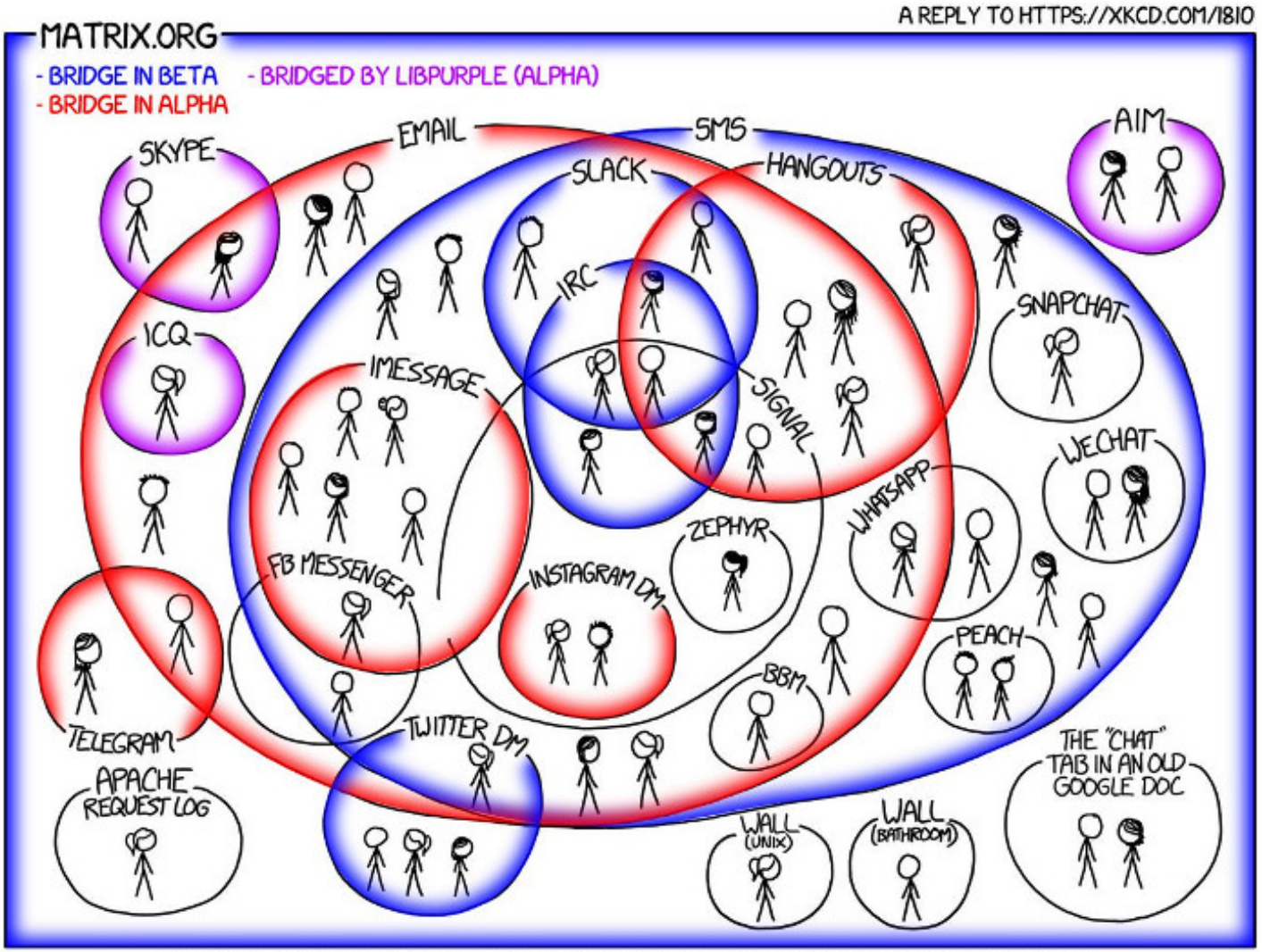
MATRIX | OLEG FIKSEL | FROSCON 2019



~~I HAVE A HARD TIME KEEPING TRACK OF WHICH CONTACTS USE WHICH CHAT SYSTEMS.~~
THIS IS ONE OF THE MAIN REASONS WE CREATED MATRIX.ORG :)

THANKS!

Special thanks for great support to:

- Matthew Hodgson - Co-Founder @matthew:matrix.org
- Ben Parsons - Developer Advocate @benpa:matrix.org

Oleg Fiksel

- DevOps Engineer
- Passionate about tech
- Like to automate everything

Goal of this talk

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- Part 1: Provide an overview of Matrix architecture and ecosystem

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- Part 1: Provide an overview of Matrix architecture and ecosystem
- Part 2: Get hands-on experience with a Matrix demo environment (get your laptops ready)

WHAT IS MATRIX?

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Matrix is an open network for secure, decentralised real-time communication.

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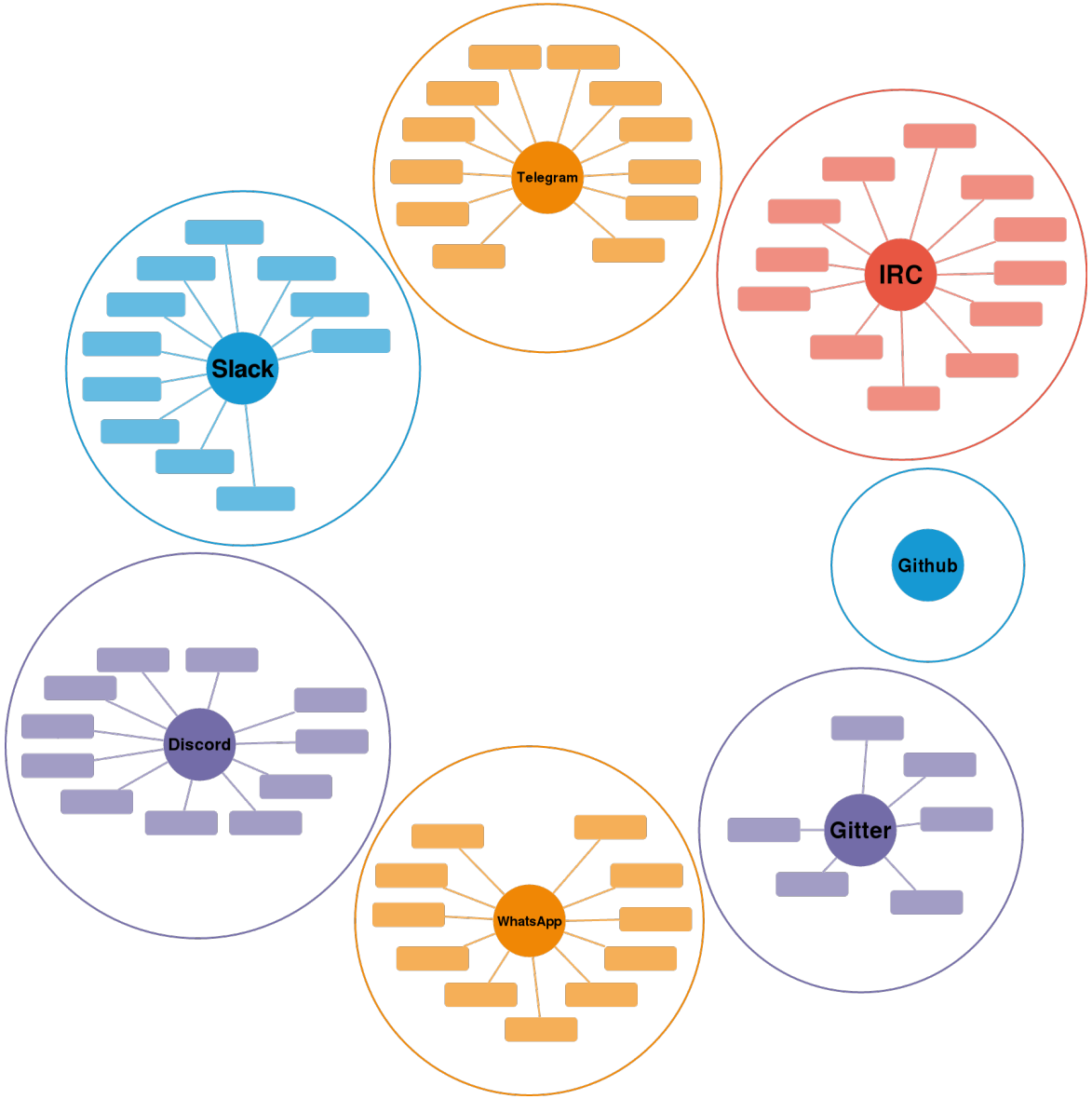

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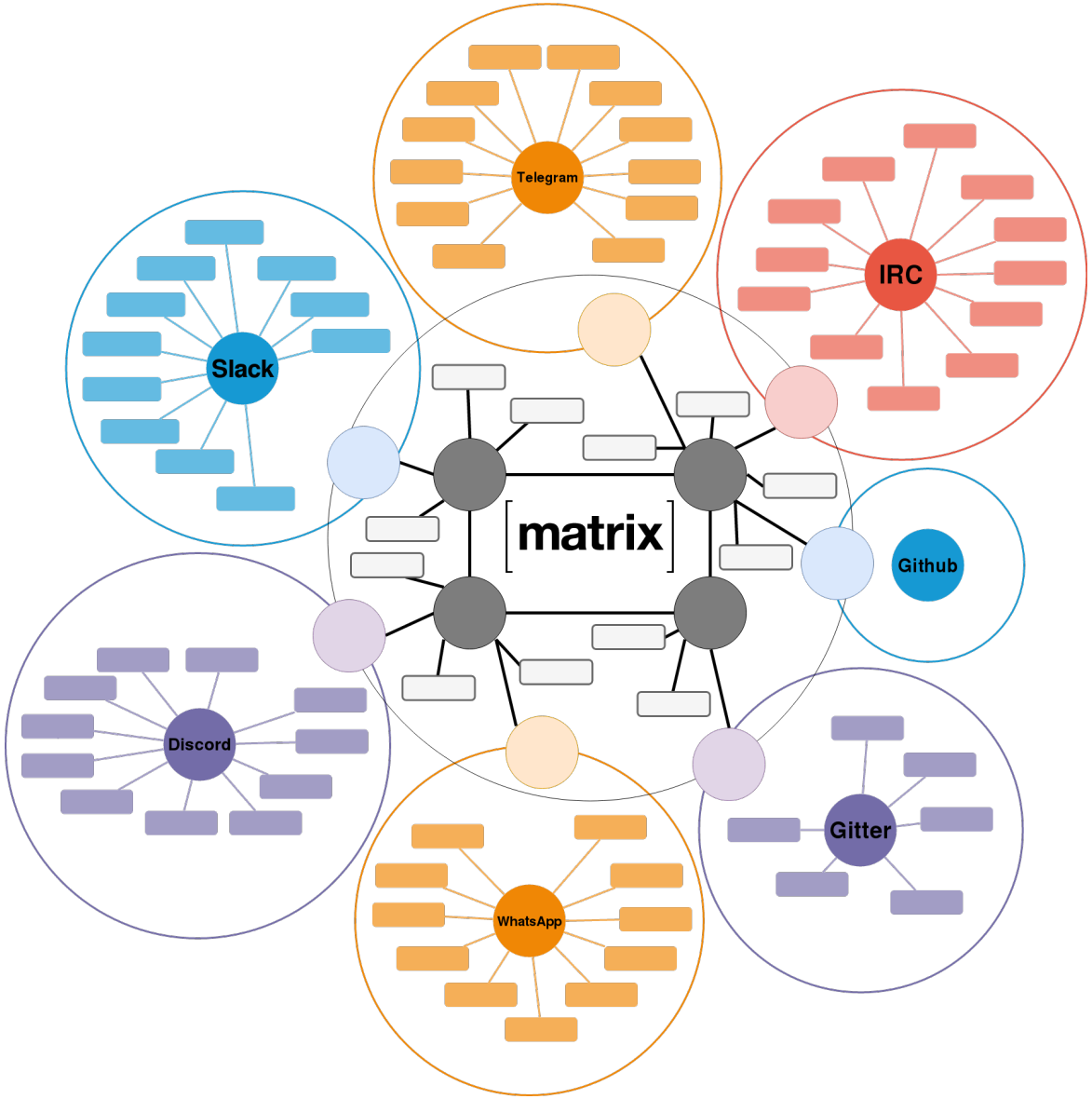

WHY I LIKE MATRIX

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- Open source

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- Integrations

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- Read & typing notifications
- Integrations
- Healthy and friendly community

MATRIX DISTRIBUTED ARCHITECTURE

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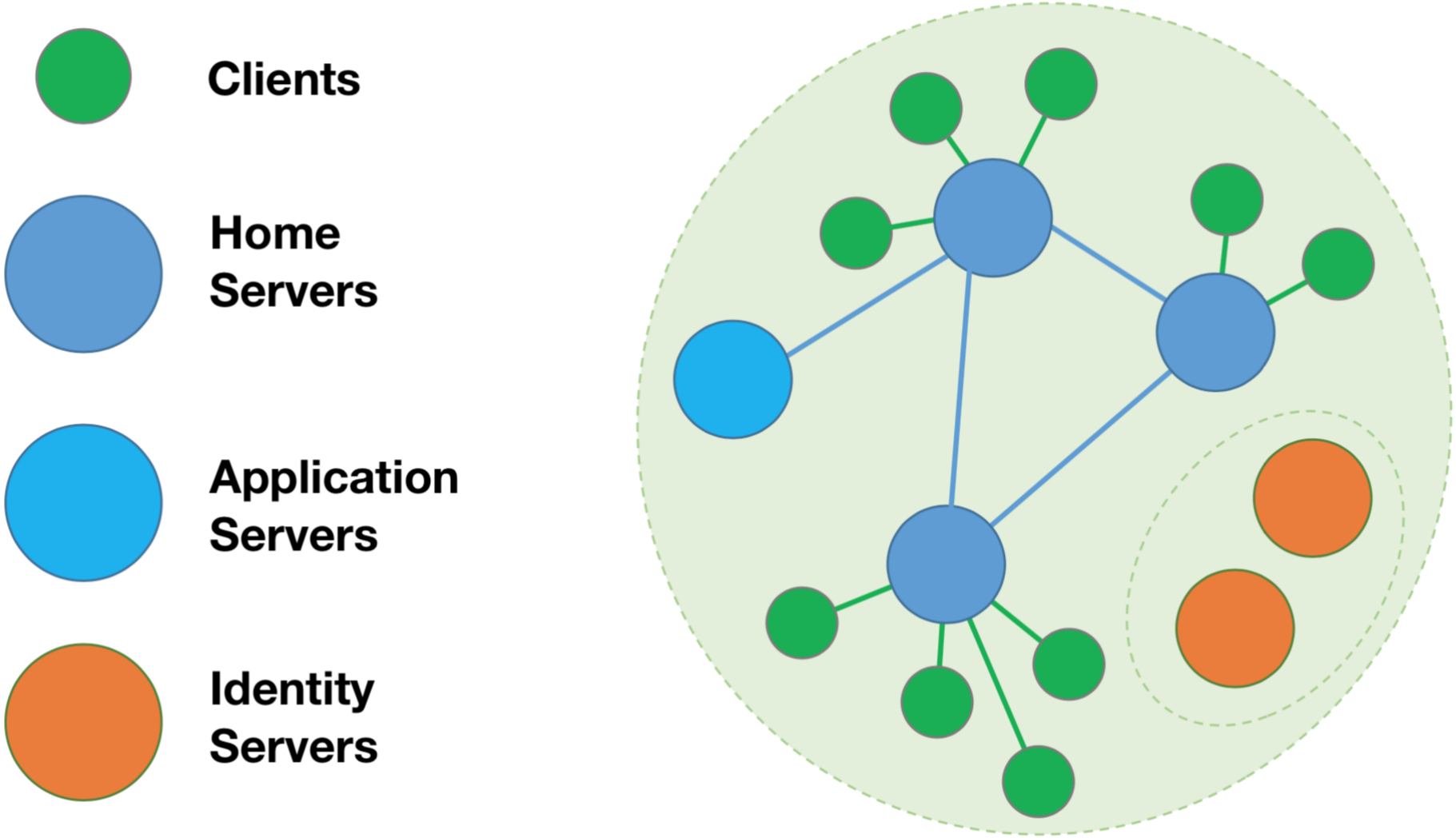

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- Two years spent building decentralised E2E crypto into the heart of Matrix
- Olm – a Double Ratchet implementation
- Megolm - Entirely new ratchet for group chat with shareable history

Security Assessment

SECURITY ASSESSMENT

- libolm 1.3.0 assessed by NCC Group in Sept 2016
- Findings released to the public!
- Olm: 2x low risk finding, 1x informational
- Megolm: 1x high, 1x medium, 4x low risk.
- All findings fixed in libolm or the Matrix Client SDKs.
- No issues found in libolm since the audit!

ECOSYSTEM

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Matrix Open Source Ecosystem

[matrix]

client-side

server-side

Synapse (1st gen Matrix Server)

Dendrite (2nd gen Server)

Application Services and Bridges

Other Servers: Ruma (Rust), Jeon (Java)…

Other Services: Bridges, Bots, Integs…

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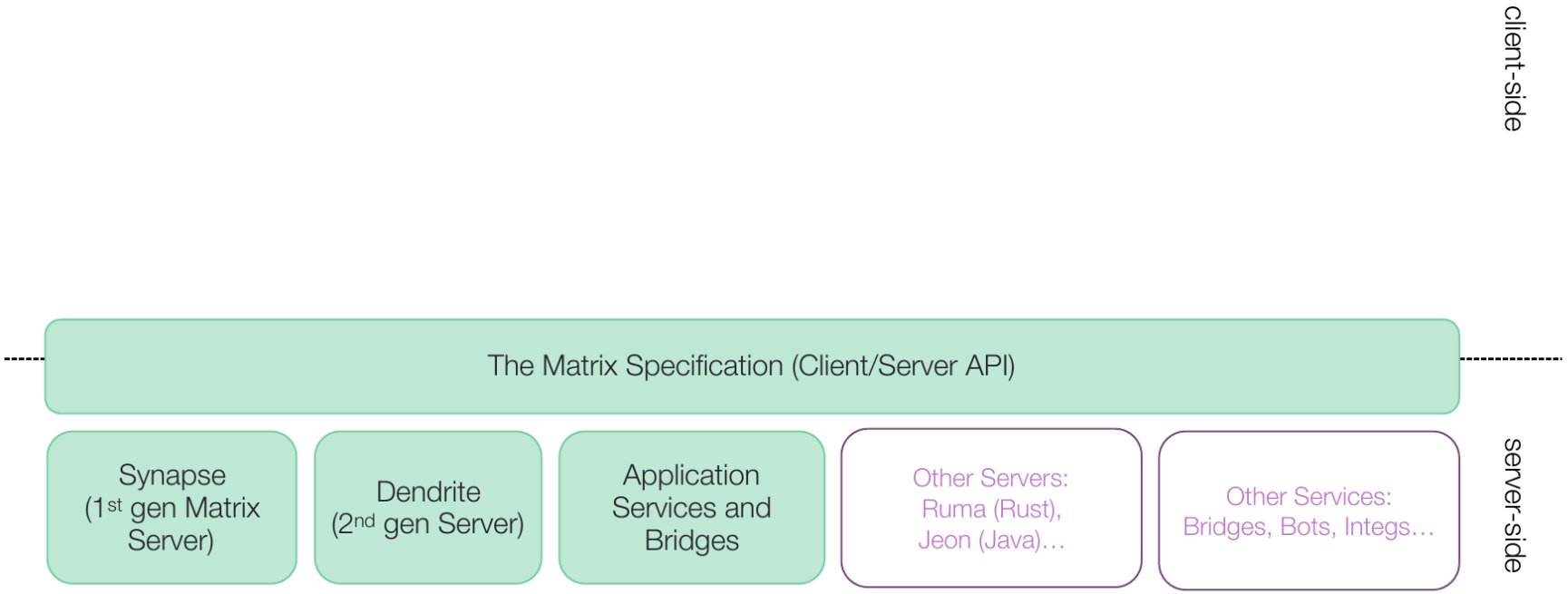
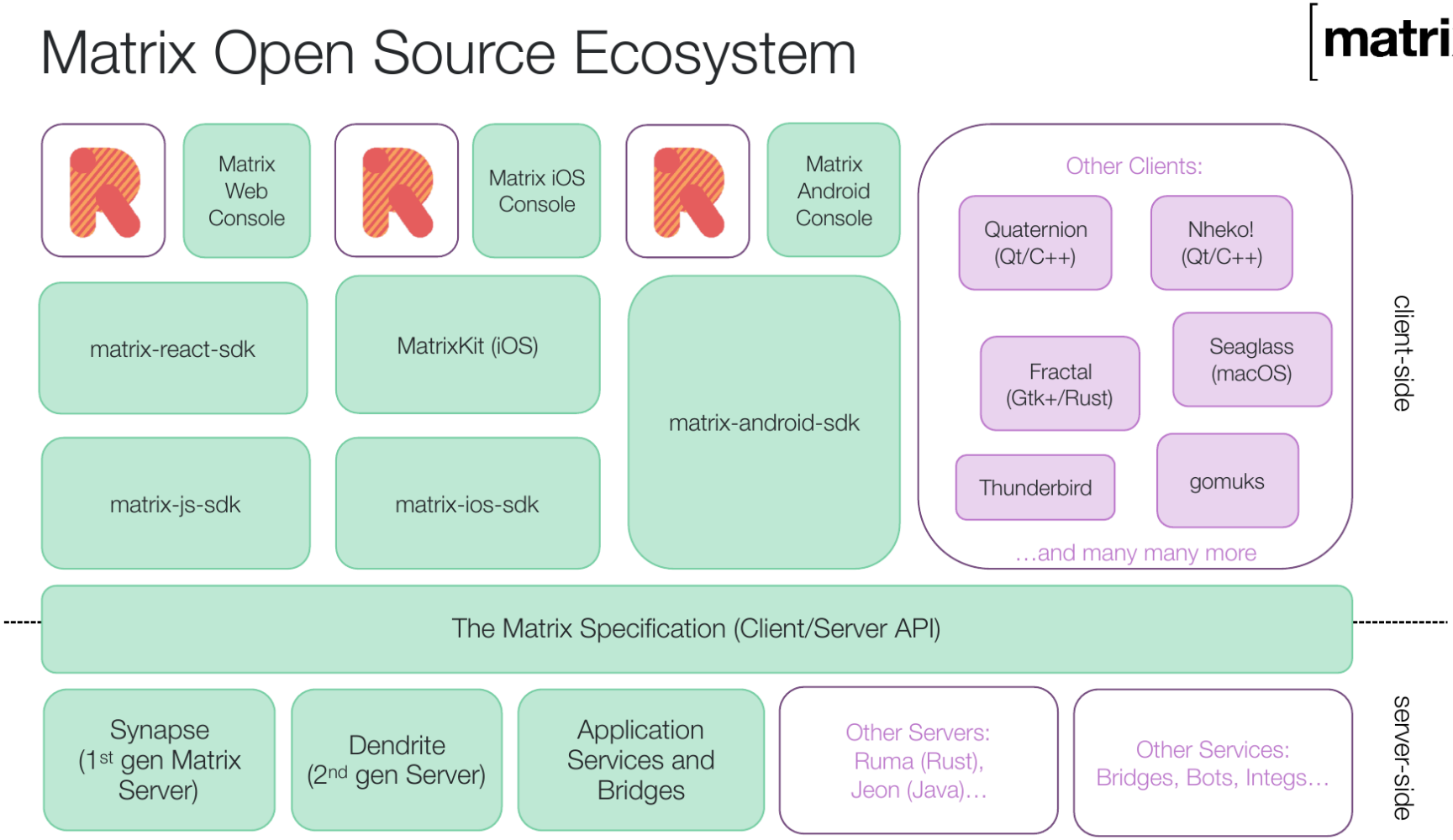
Matrix Open Source Ecosystem



ECOSYSTEM


Matrix Open Source Ecosystem
[matrix]
Matrix Web Console
Matrix iOS Console
Matrix Android Console
matrix-react-sdk
MatrixKit (iOS)
matrix-android-sdk
matrix-js-sdk
matrix-ios-sdk
Other Clients:
Quaternion (Qt/C++)
Nheko! (Qt/C++)
Fractal (Gtk+/Rust)
Seaglass (macOS)
Thunderbird
gomuks
…and many many more
client-side
The Matrix Specification (Client/Server API)
Synapse (1st gen Matrix Server)
Dendrite (2nd gen Server)
Application Services and Bridges
Other Servers: Ruma (Rust), Jeon (Java)…
Other Services: Bridges, Bots, Integs…
server-side

CLIENTS

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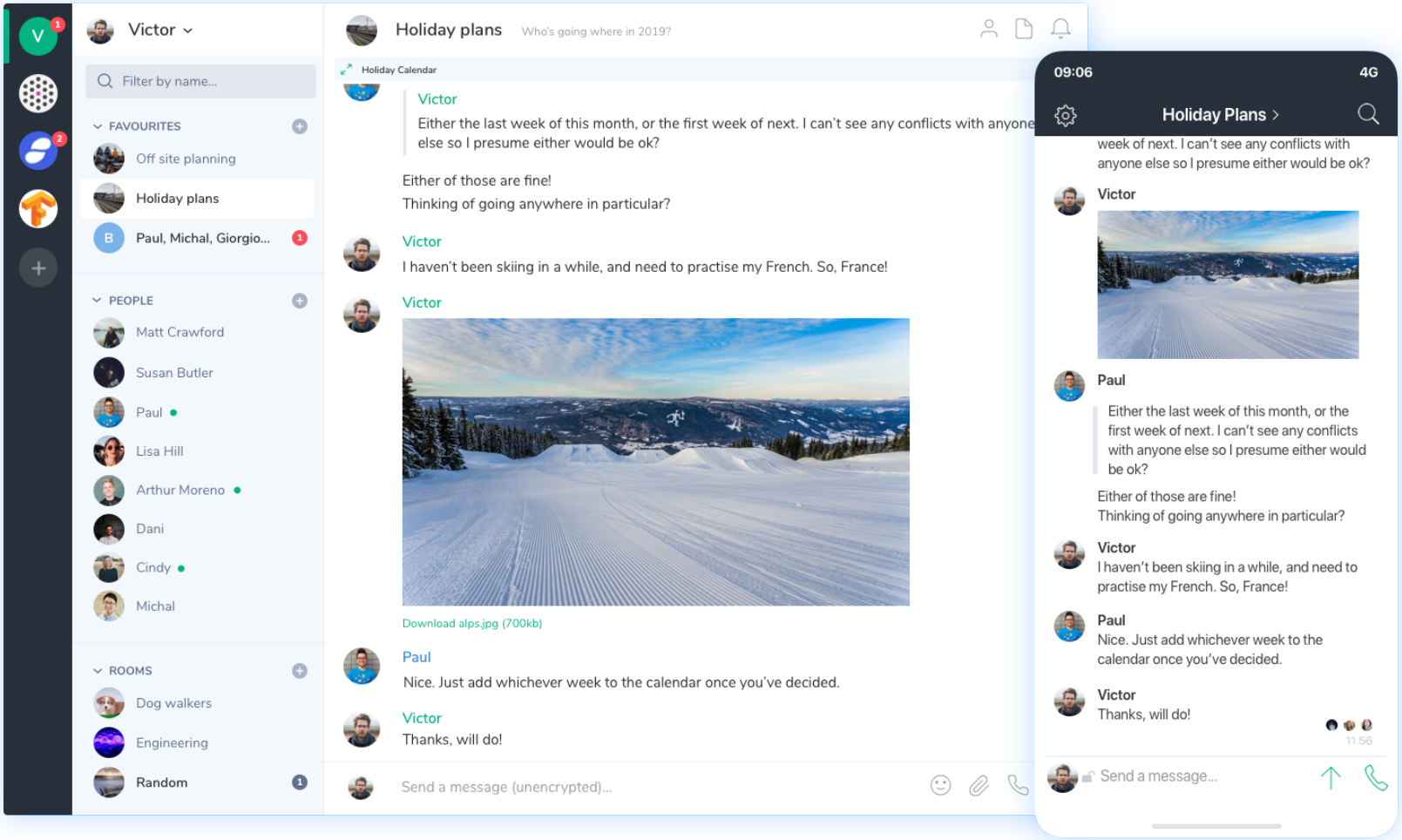
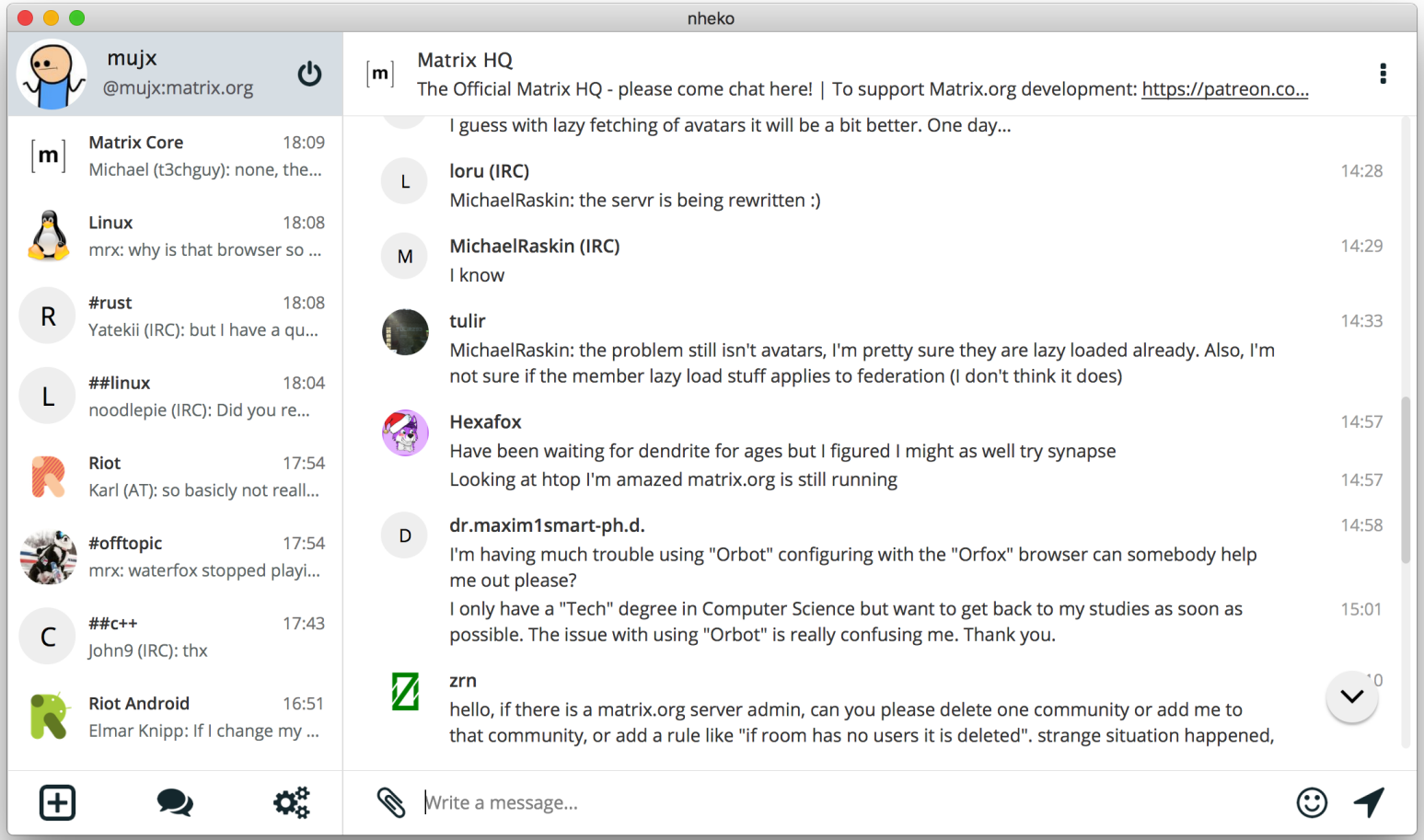
- Fractal (GTK)
- Gomuks (TUI)

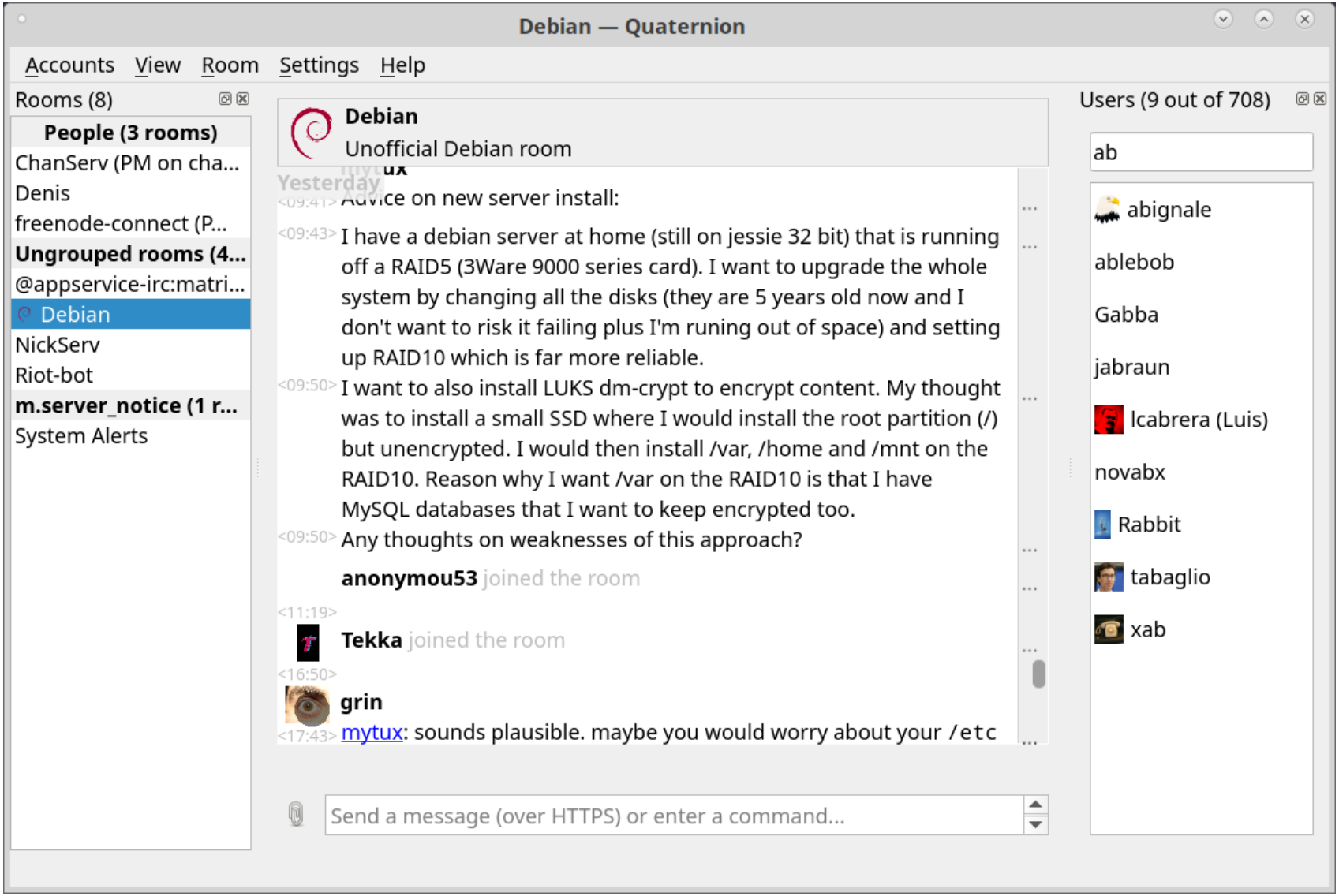
CLIENTS - RIOT



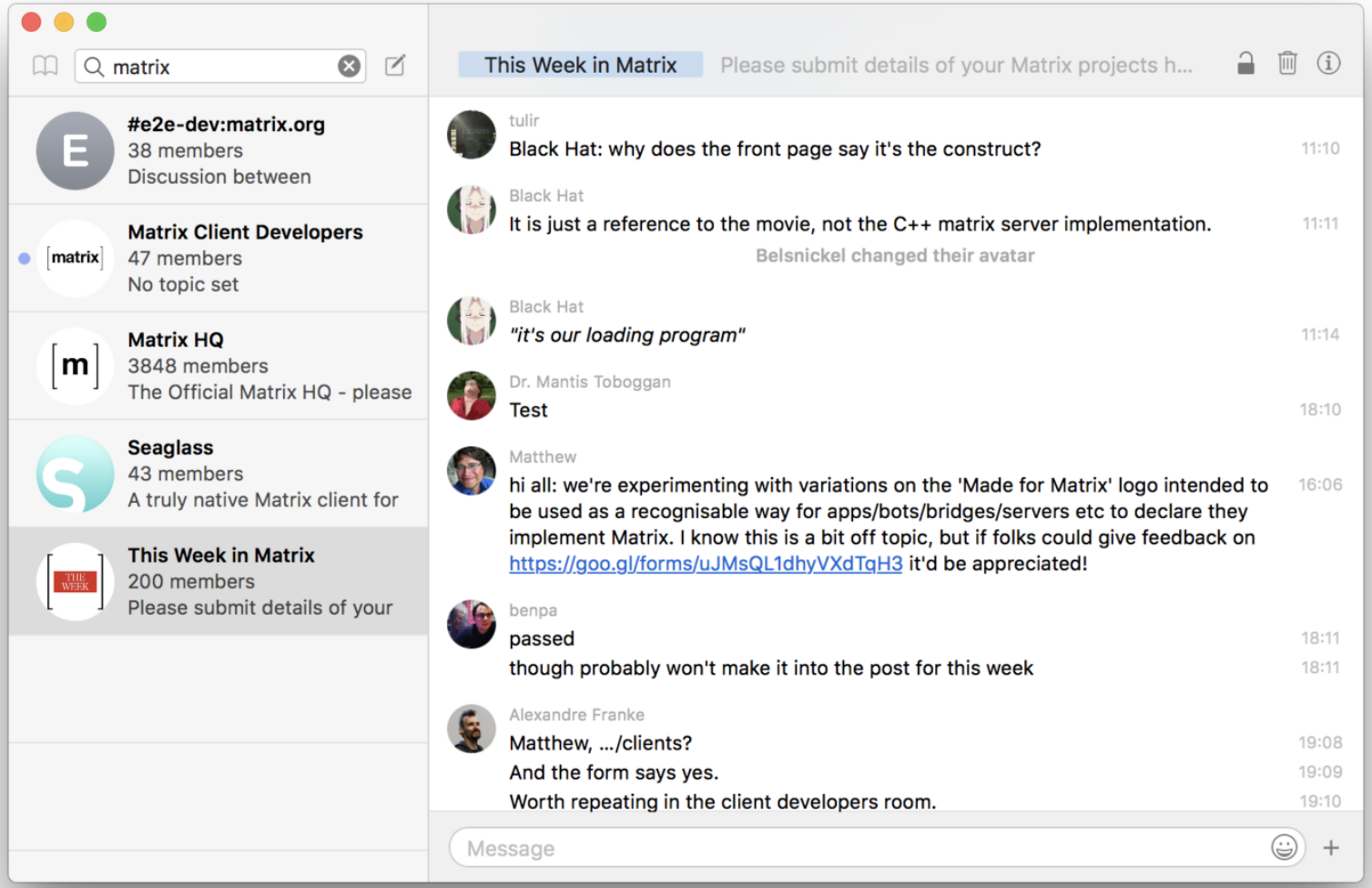
Clients - Nheko



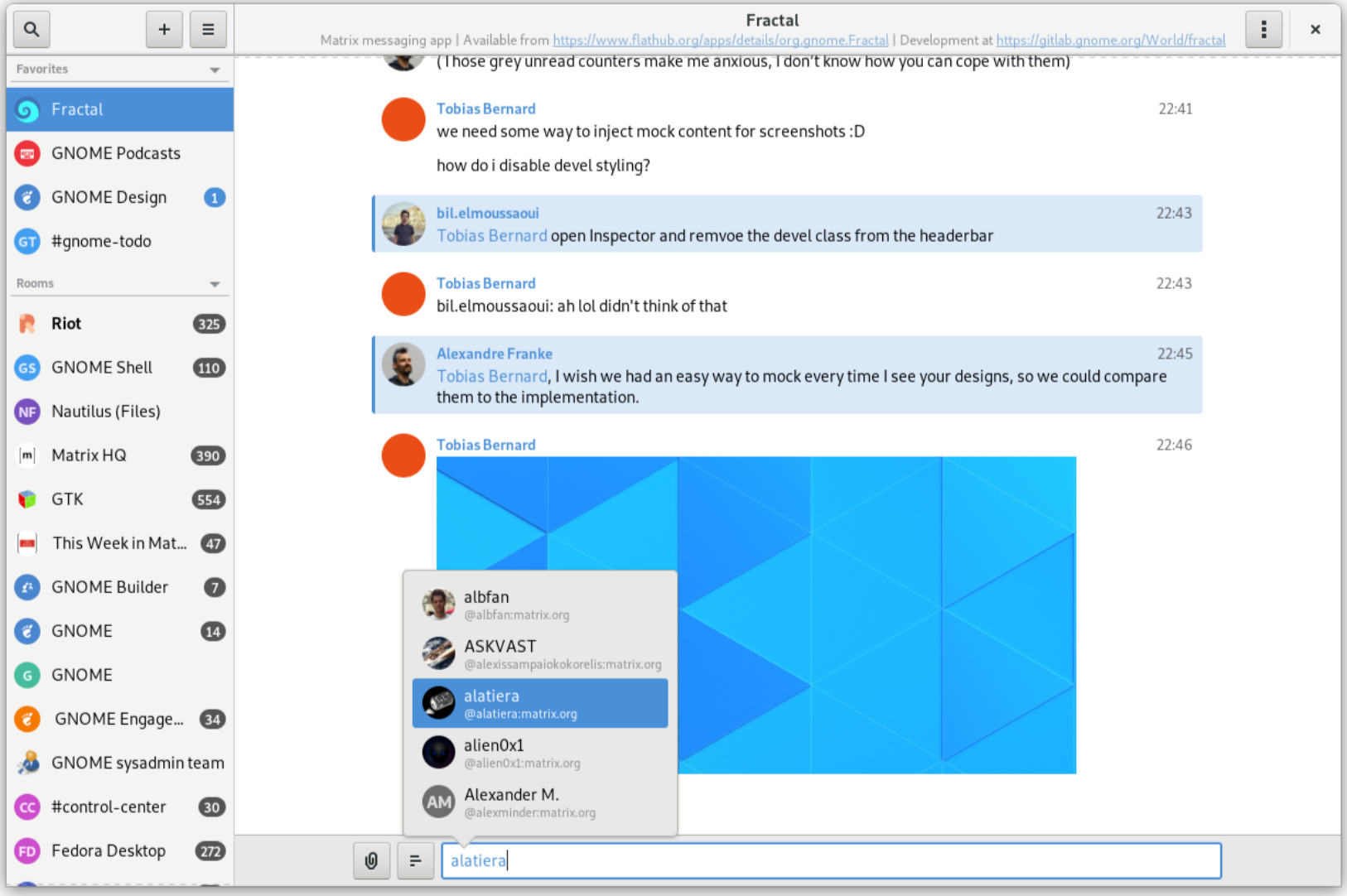
CLIENTS - QUATERNION



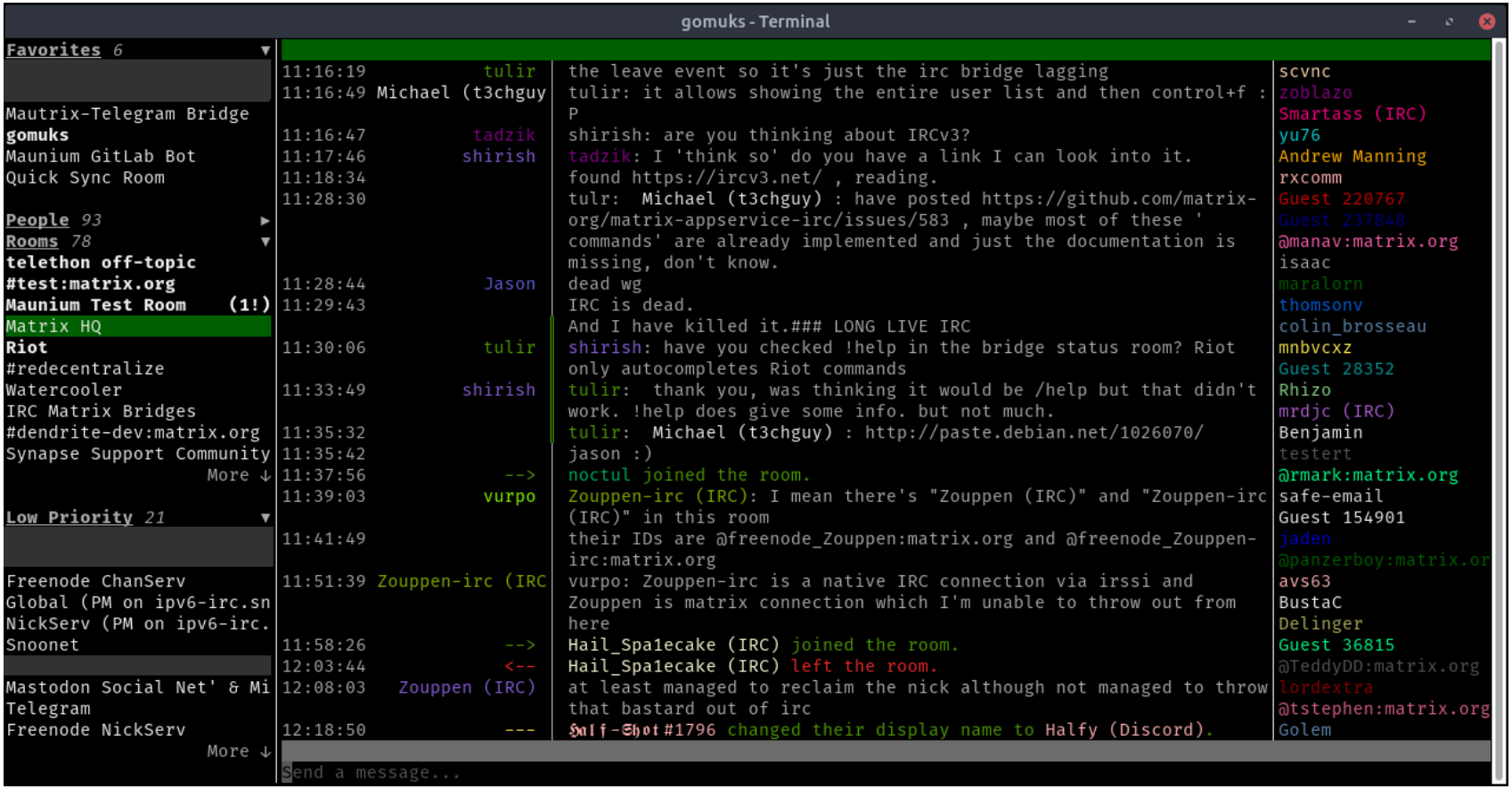
CLIENTS - SEAGLASS



CLIENTS - FRACTAL



CLIENTS - GOMUKS



BRIDGES

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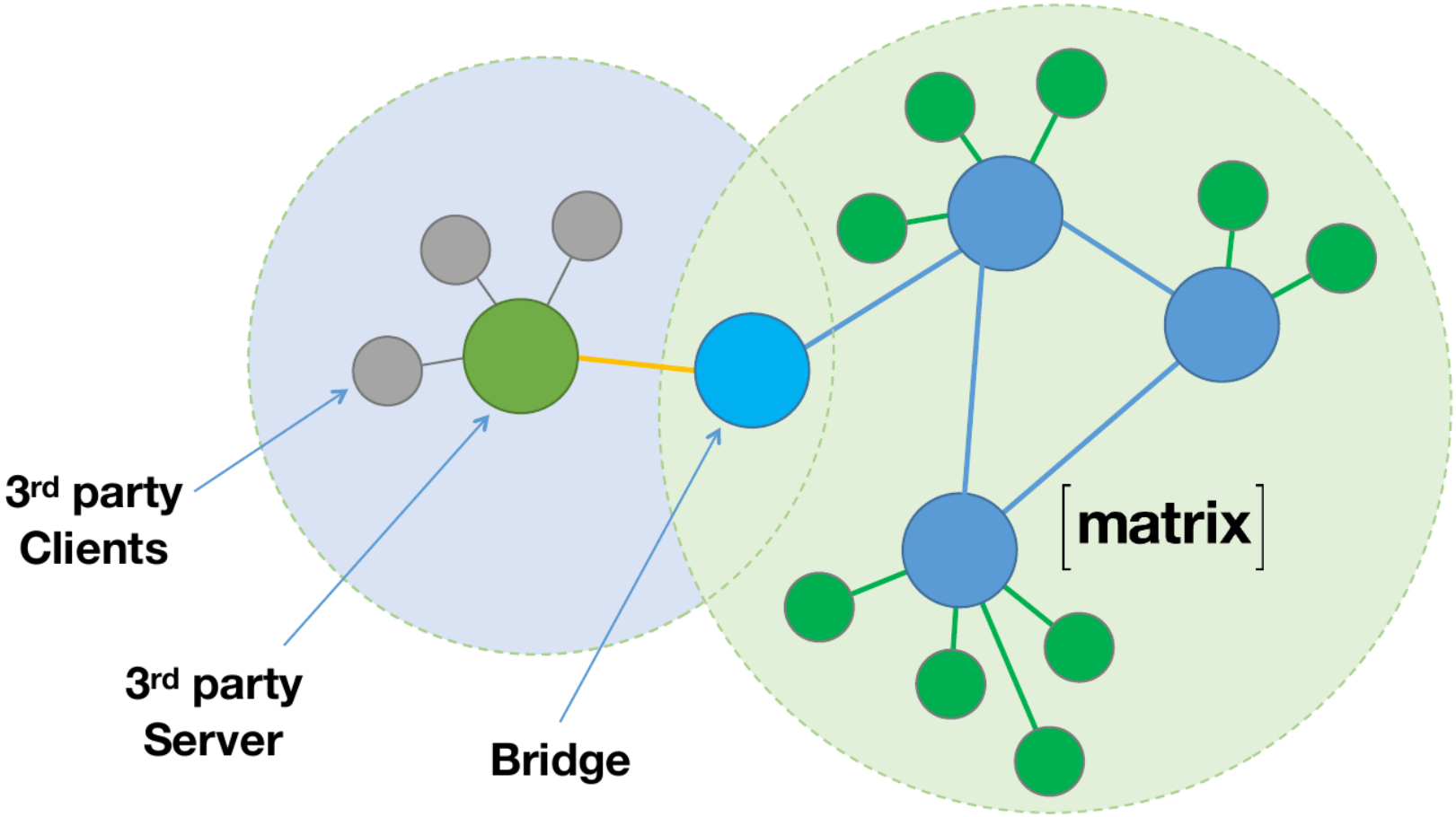
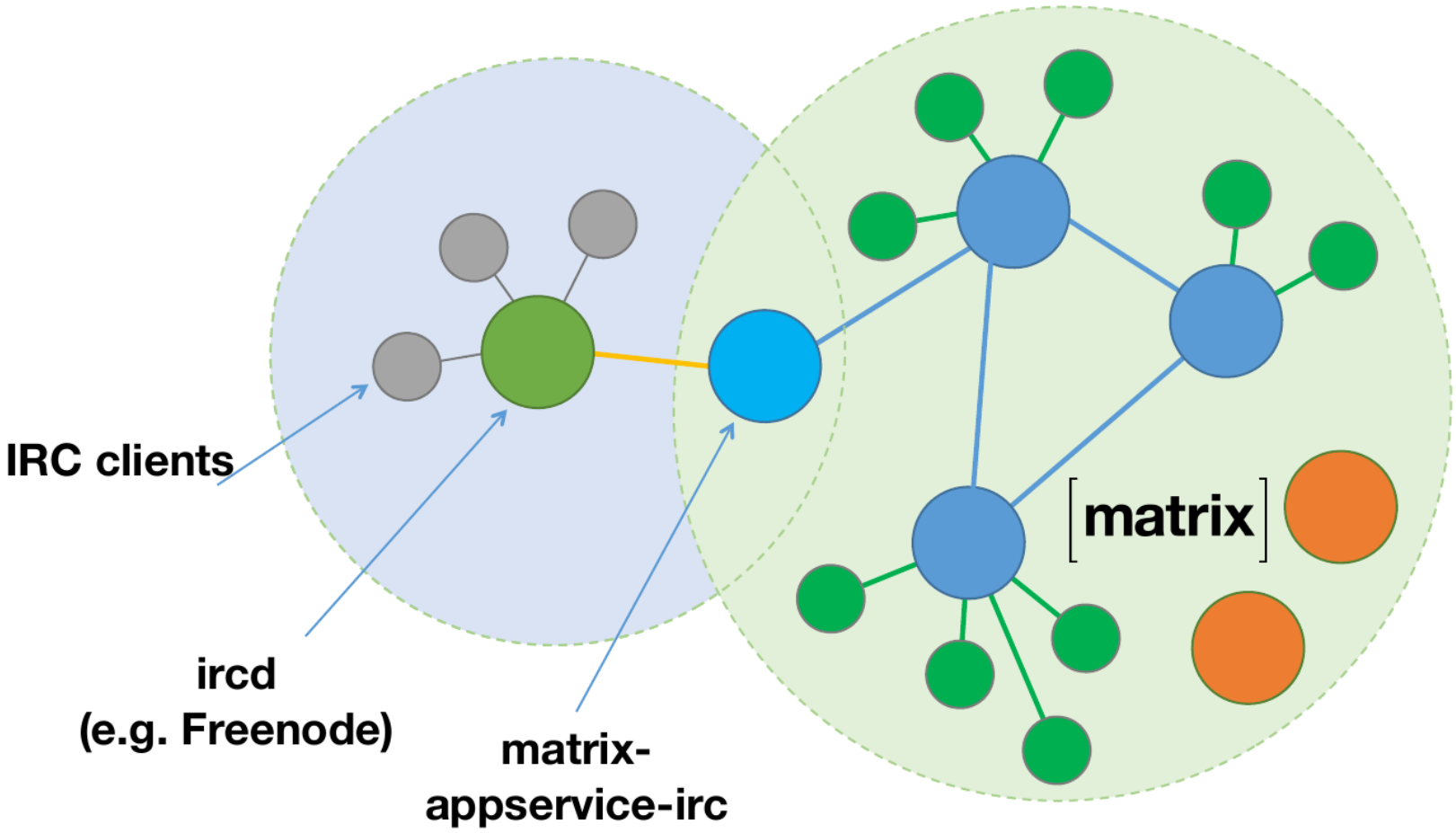


Bridges



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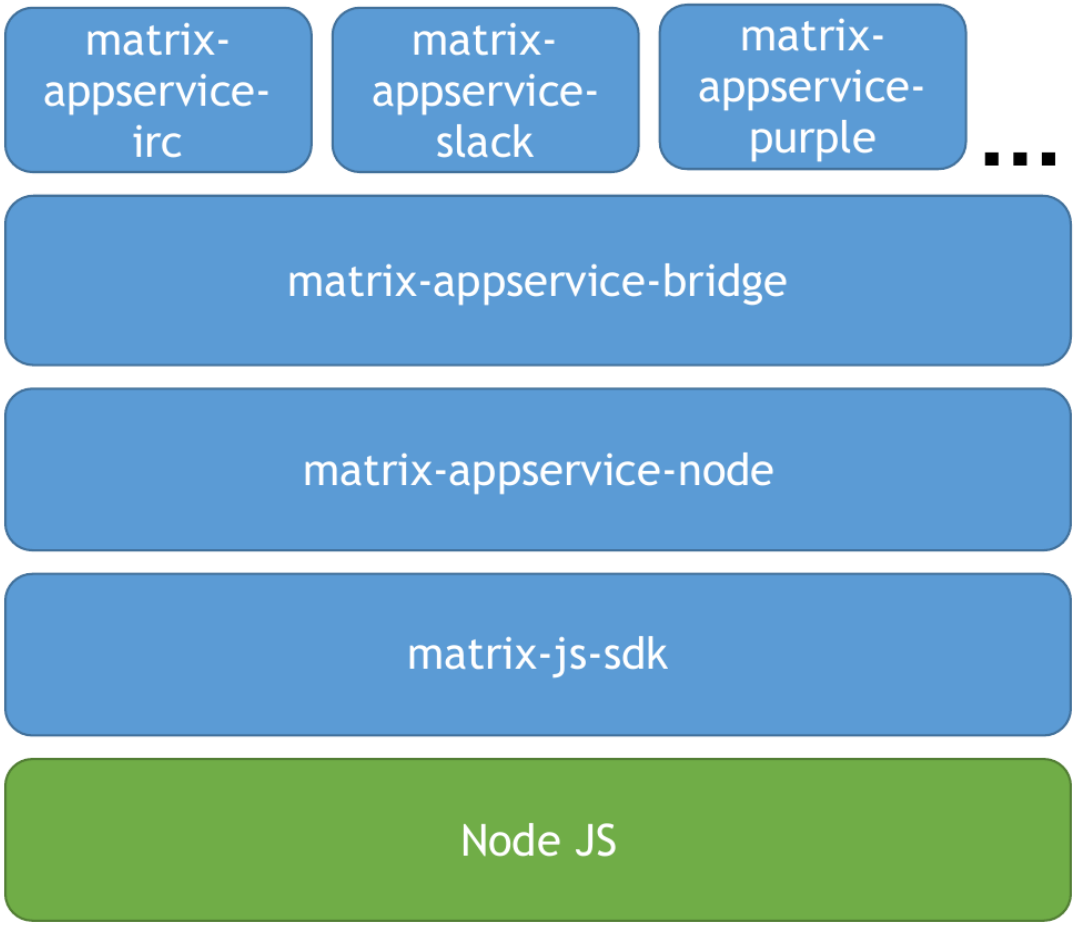
matrix-appservice-irc
matrix-appservice-slack
matrix-appservice-purple
...
matrix-appservice-bridge
matrix-appservice-node
matrix-js-sdk
Node JS

Integrations

Integrations

- Etherpad

Integrations

- Etherpad
- RSS

INTEGRATIONS

- Etherpad
- RSS
- Grafana

Integrations

- Etherpad
- RSS
- Grafana
- Jitsi

Integrations

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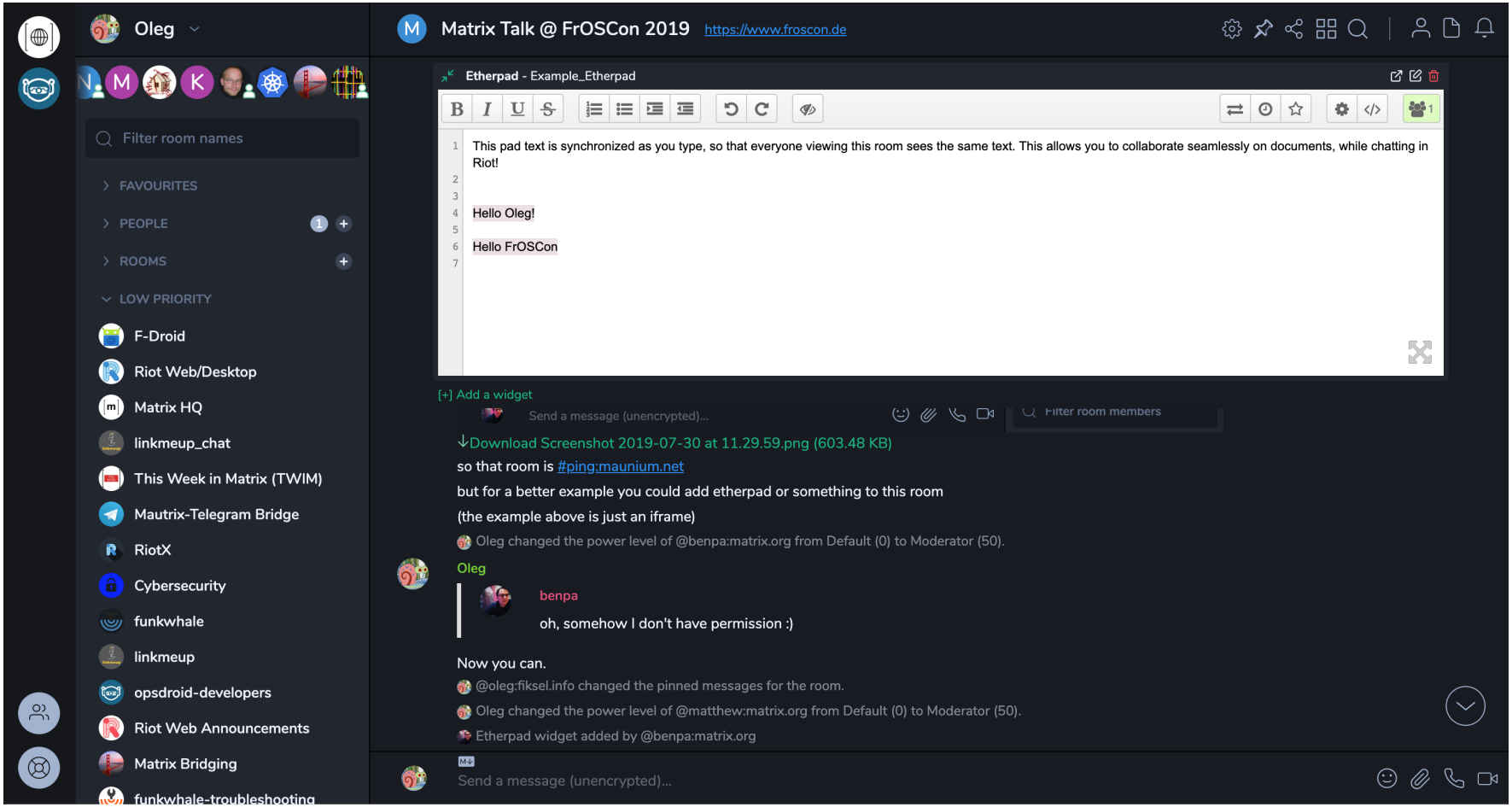
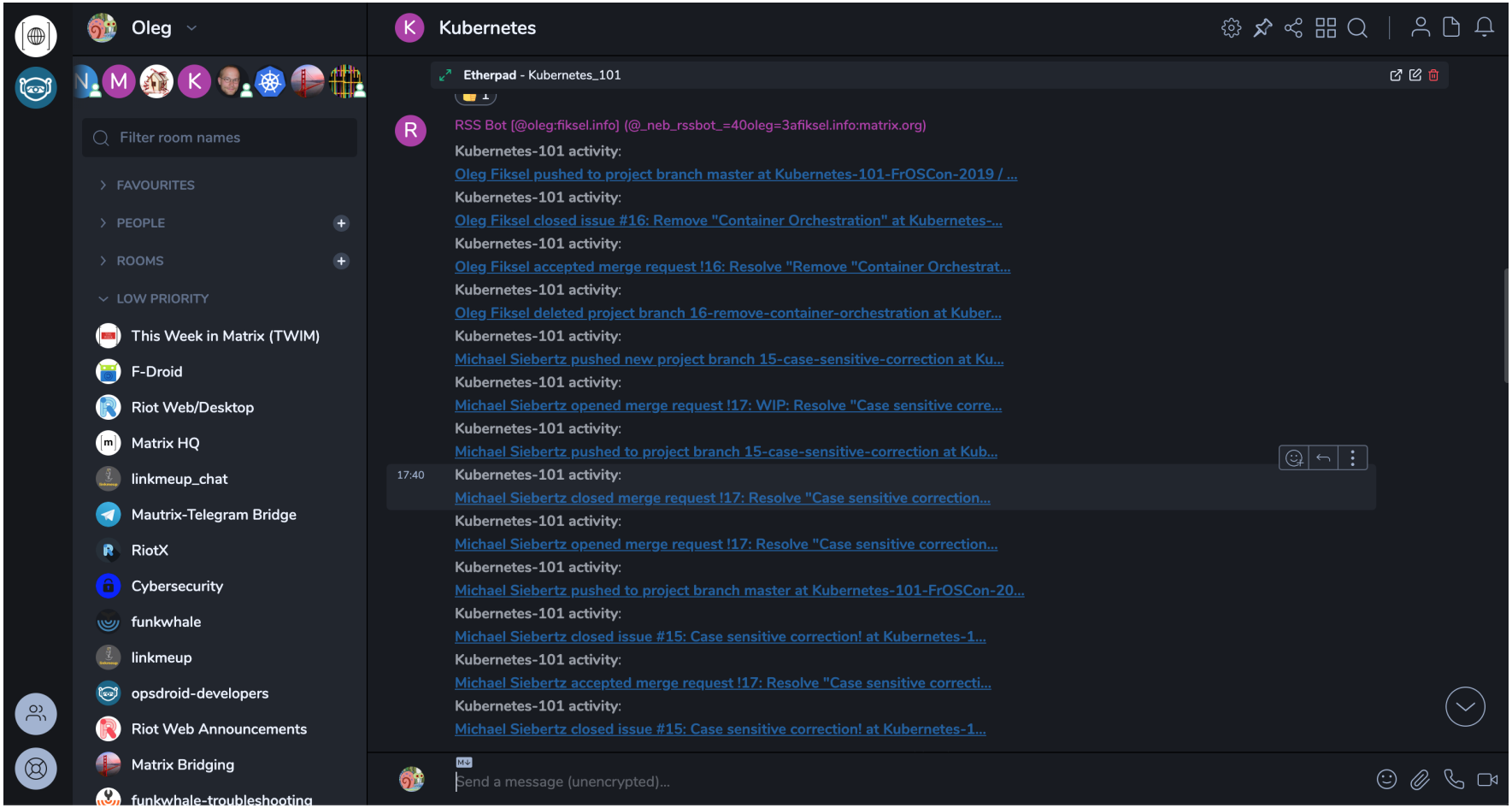
- Custom

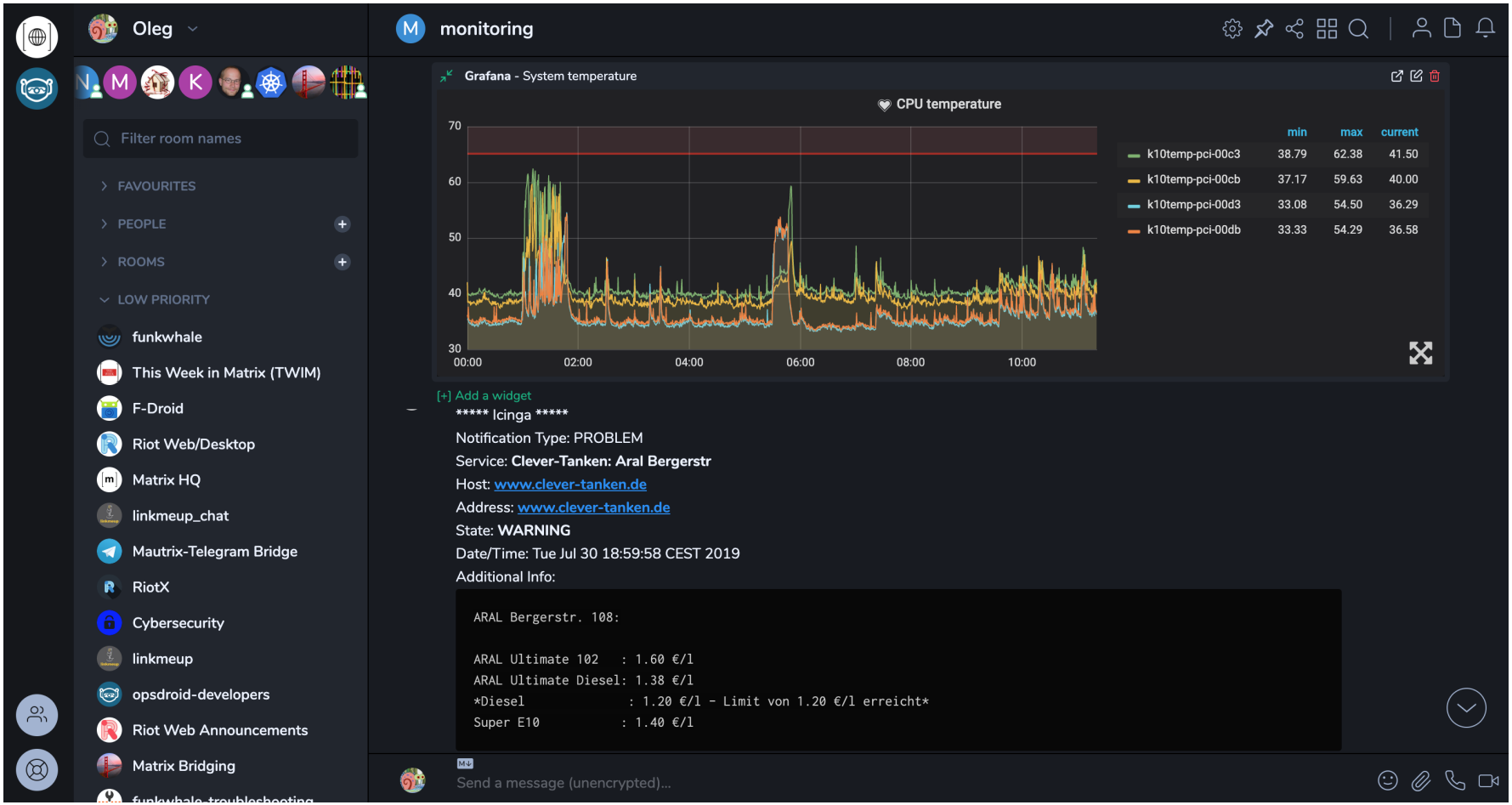
Integrations - Etherpad



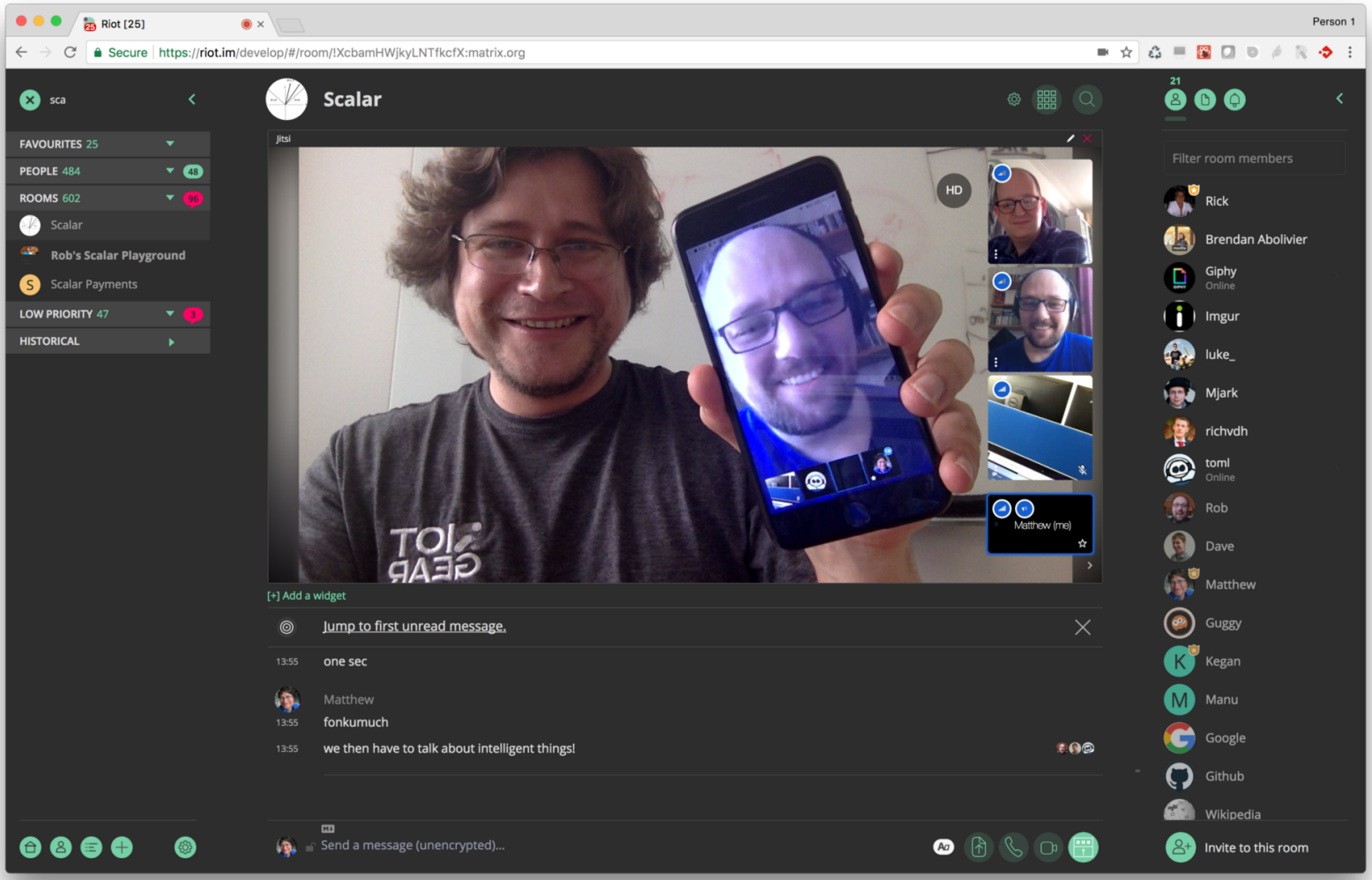
INTEGRATIONS - RSS



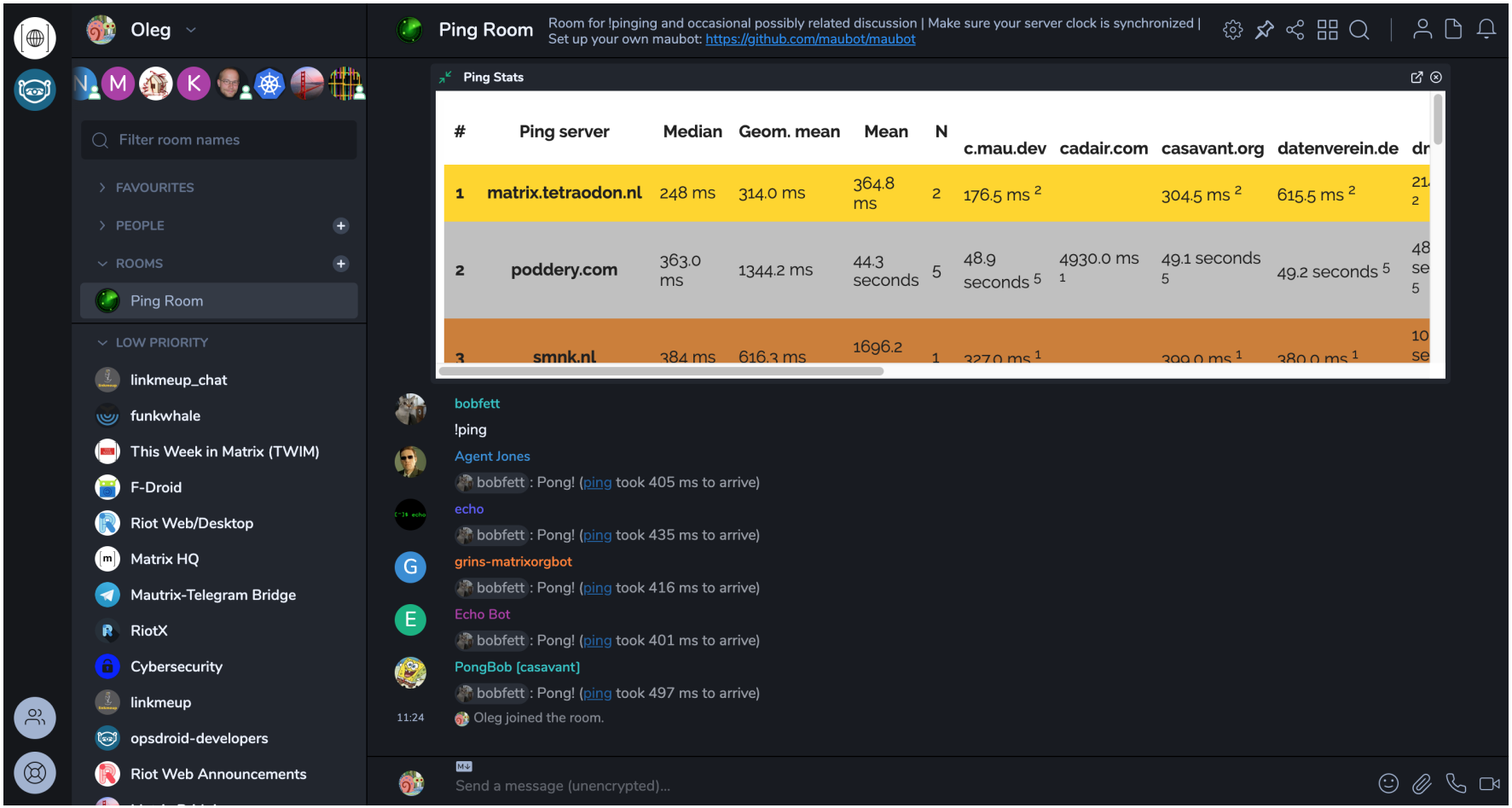
INTEGRATIONS - GRAFANA



Integrations - Jitsi



INTEGRATIONS - CUSTOM



Client-Server API

```
curl -XPOST -d '{"msgtype":"m.text", "body":"Wake up Neo..."}' "
    https://matrix.org/_matrix/client/r0/rooms/#matrix:matrix.
    org/send/m.room.message?access_token=ACCESS_TOKEN"
{
  "event_id": "YUwRidLecu"
}
```

Server-Server API

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- Synchronises messages and room state between servers, in real-time
- Can retrieve historic messages from each other
- Query profile and presence information about users on each other's servers

Application Services API

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- Can subscribe to server traffic to provide custom application logic

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- Can subscribe to server traffic to provide custom application logic
- Can masquerade as 'virtual users'

Latest features & Roadmap

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MATRIX 1.0 RELEASE

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- First stable release of the protocol standard

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- Using .well-known URIs to discover servers
- Switching to room version 4 for new rooms (fixes the Hotel California bug)

EDITS & REACTIONS

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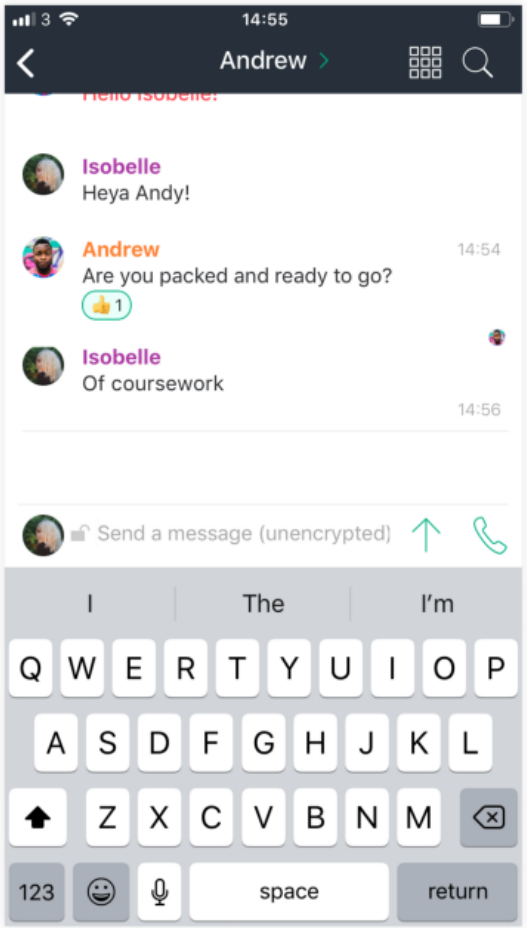

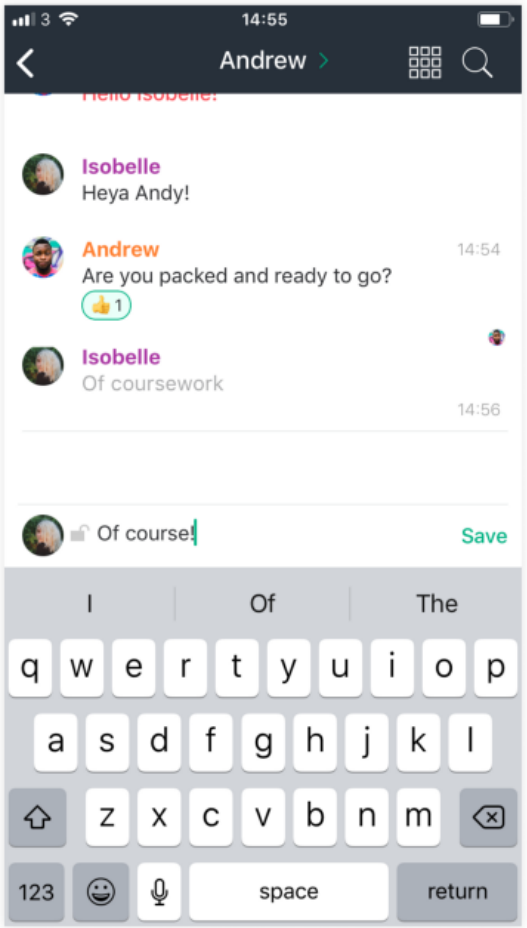

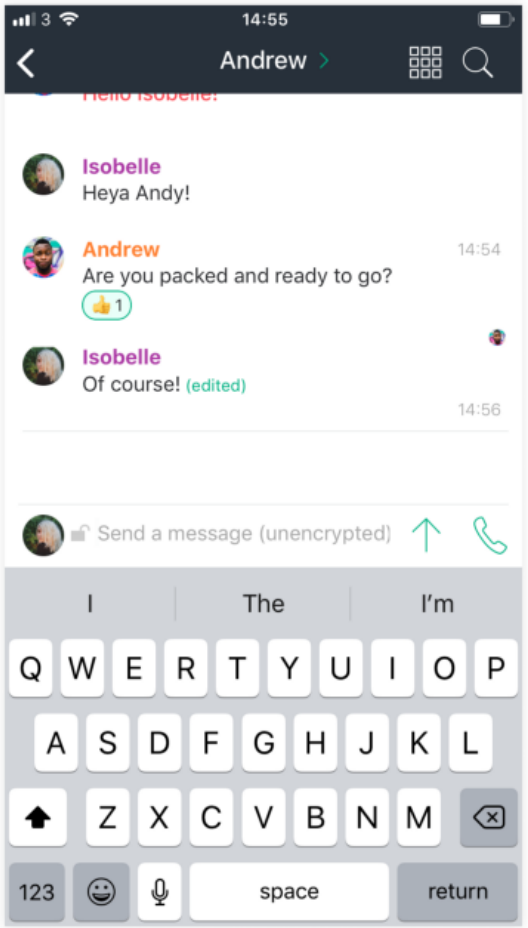

NEW KEY BACKUP (1/5)

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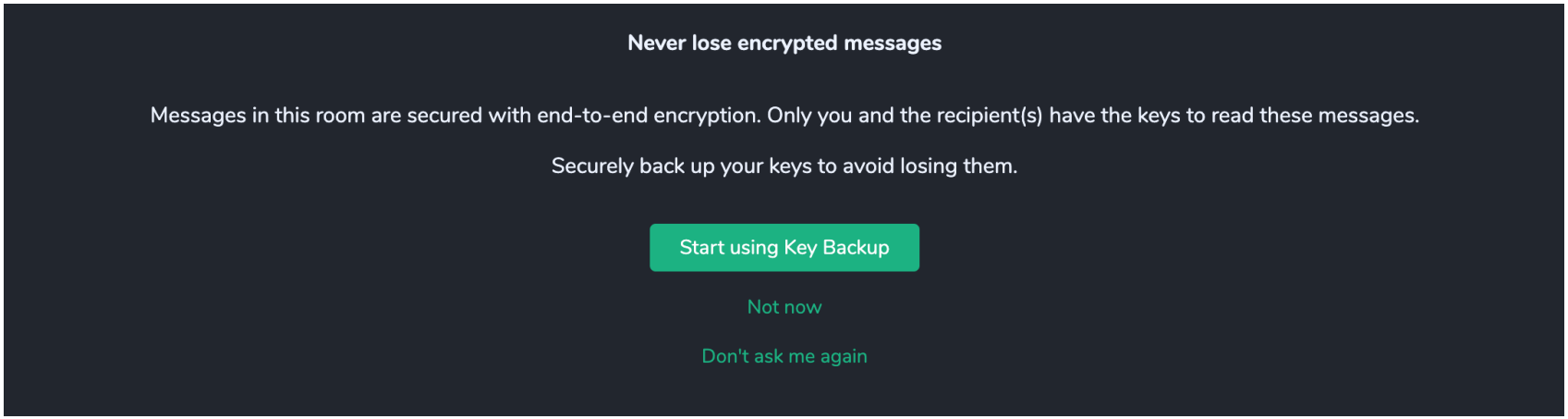
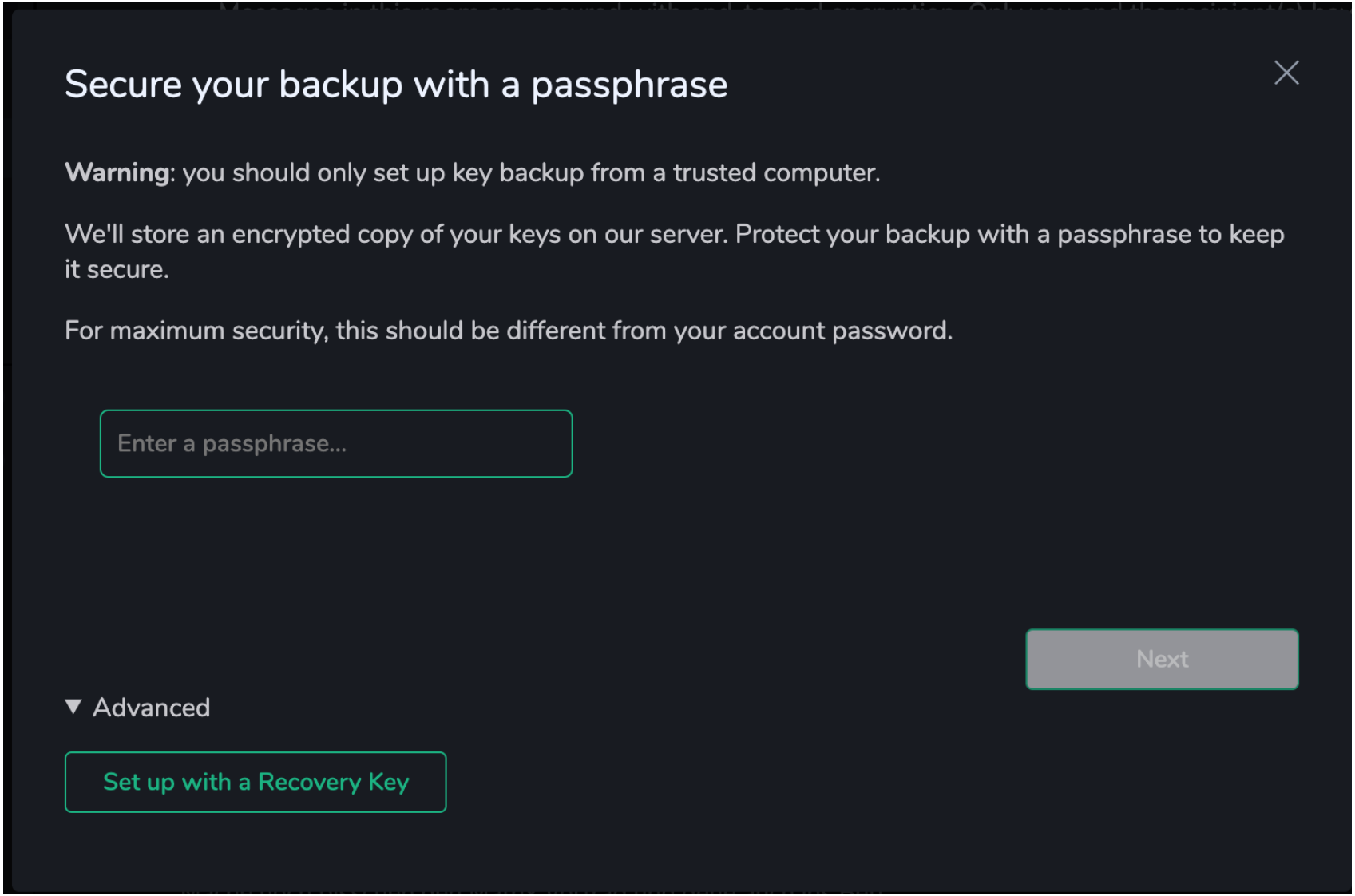
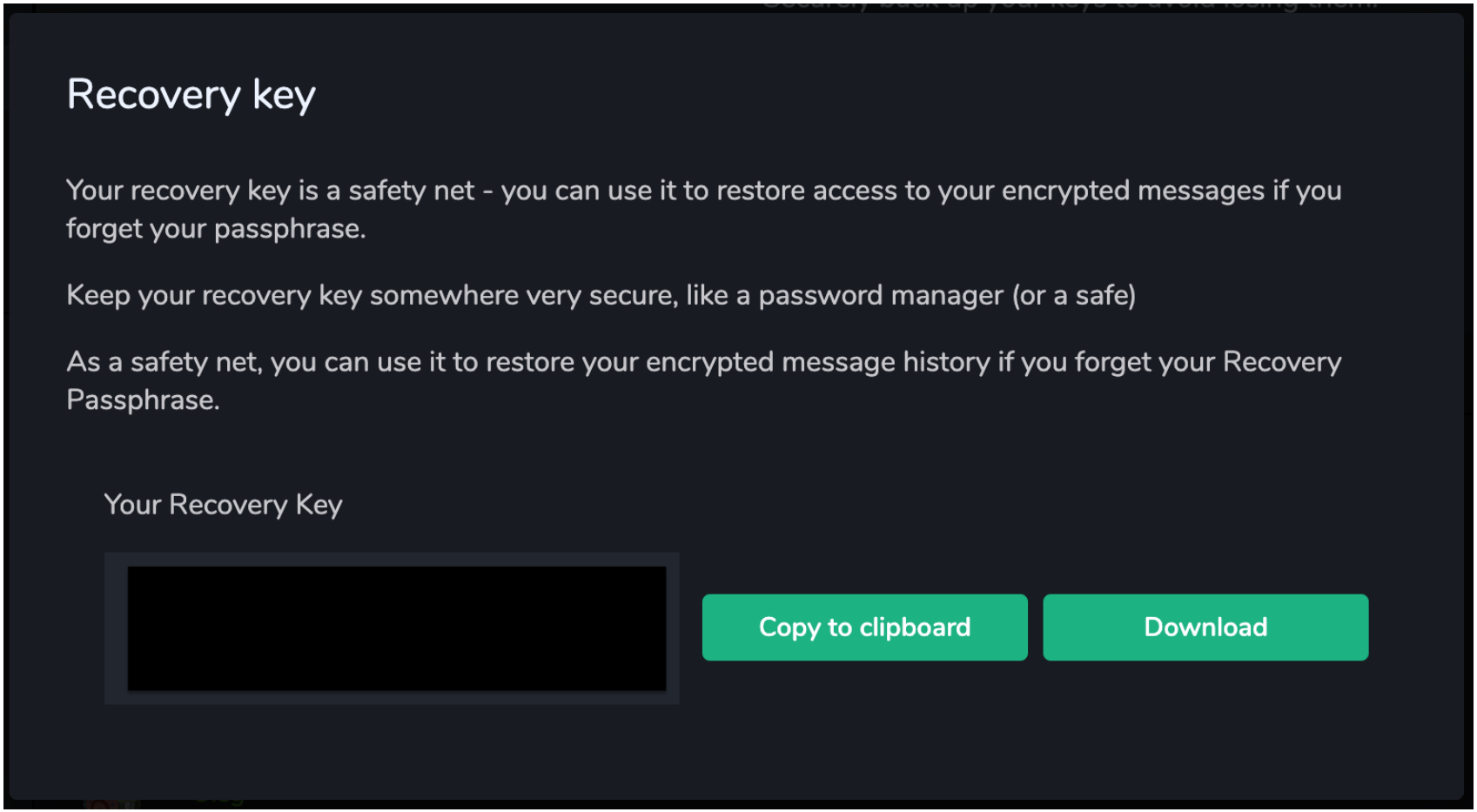


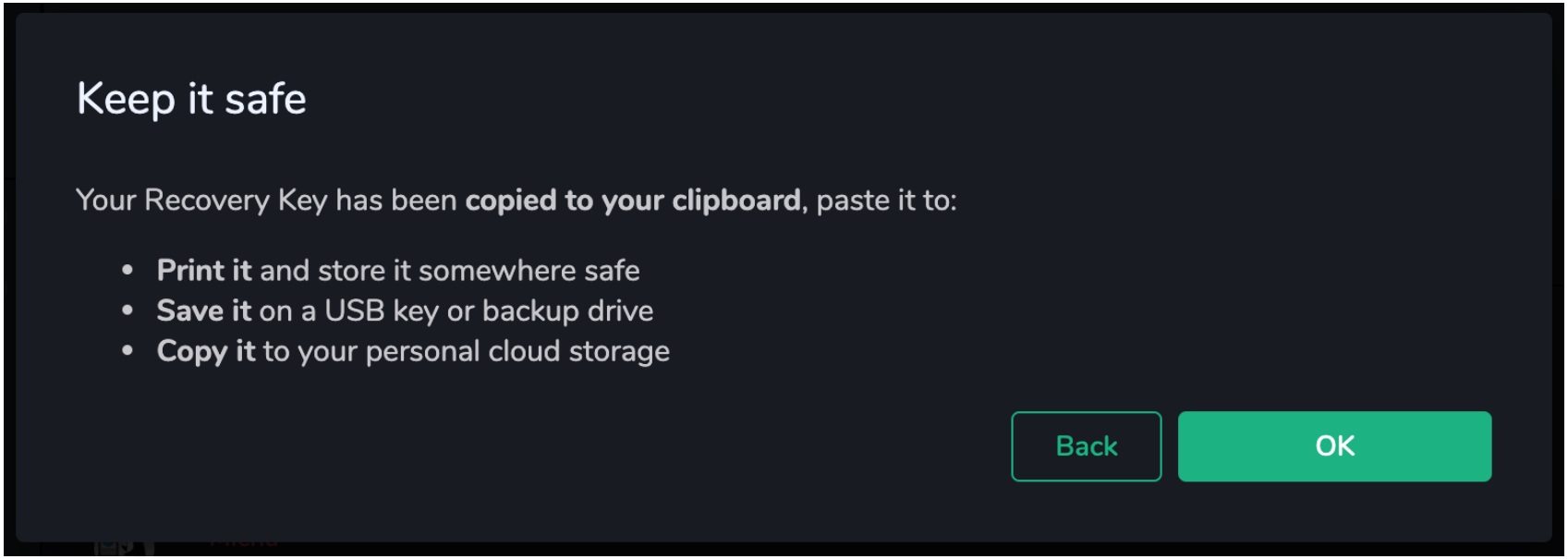
NEW KEY BACKUP (2/5)



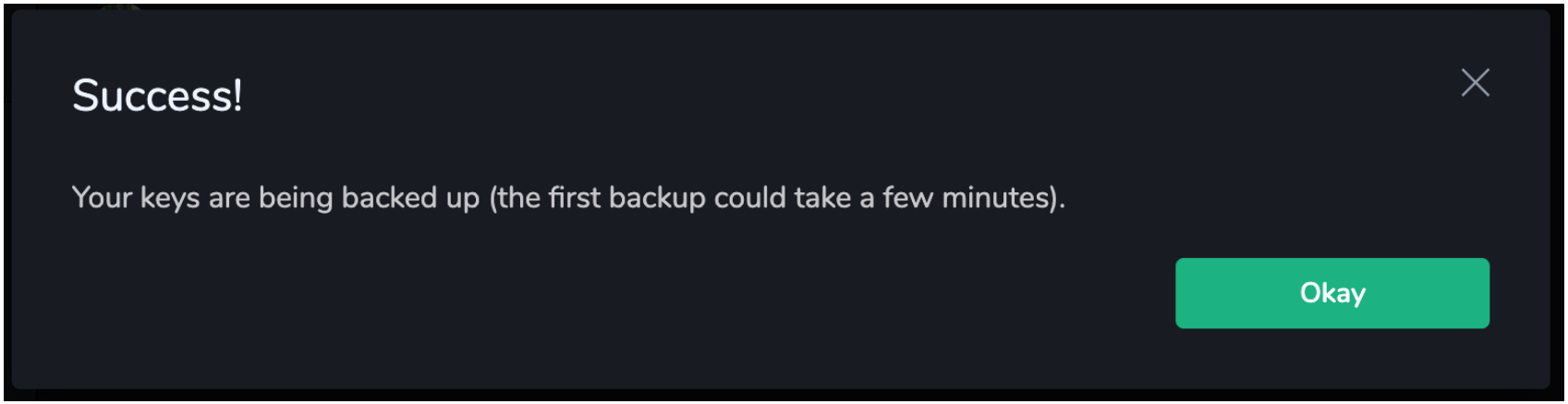
NEW KEY BACKUP (3/5)



NEW KEY BACKUP (4/5)



NEW KEY BACKUP (5/5)



Roadmap

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- Improve Synapse's minimal footprint
  To run on smaller hardware.
- New device trust (cross signing devices)
  Key step to enable E2EE by default.

Summary

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- Matrix solves the problem of uniting those platforms in a way **YOU** want it
- Matrix community is rapidly evolving
- The community is great! Get involved!

GENTLEMEN, START YOUR ~~ENGINES~~ LAPTOPS

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- Have fun!

Thanks!

Oleg Fiksel

Email: oleg@fiksel.info

Matrix: @oleg:fiksel.info

Links

- Matrix 1.0 release notes
- Message Editing & Reactions
- Deploy Matrix stack with Ansible
- Proposals for device trust