



Liberating Communication with Matrix

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What is Matrix?

**An open decentralised
conversation store and
message bus.**

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Why?

**To create a global
communication
meta-network that bridges
all the existing silos &
liberates our
communication to be
controlled only by us.**

Matrix is for:

Group Chat (and 1:1)

WebRTC Signalling

Bridging Comms Silos

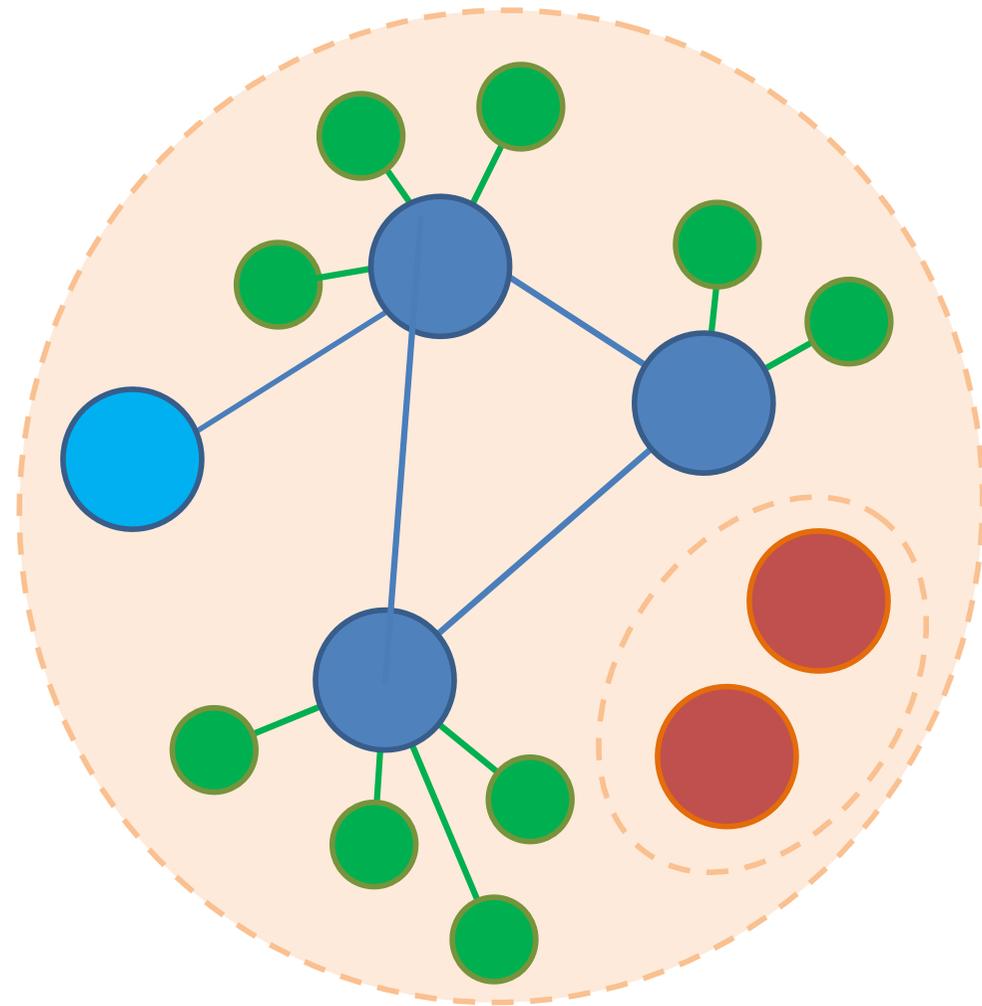
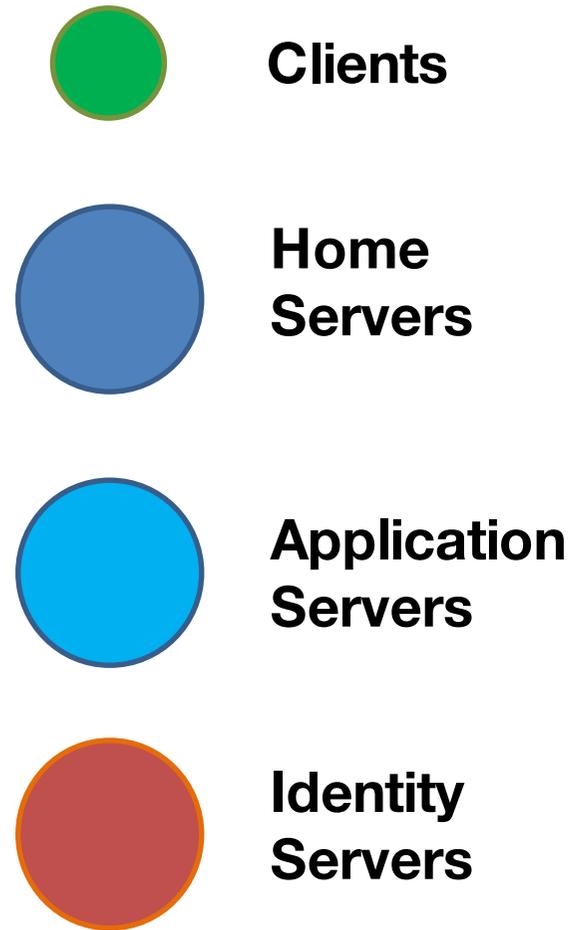
Internet of Things Data

**...and anything else which needs to
pubsub persistent data to the world.**

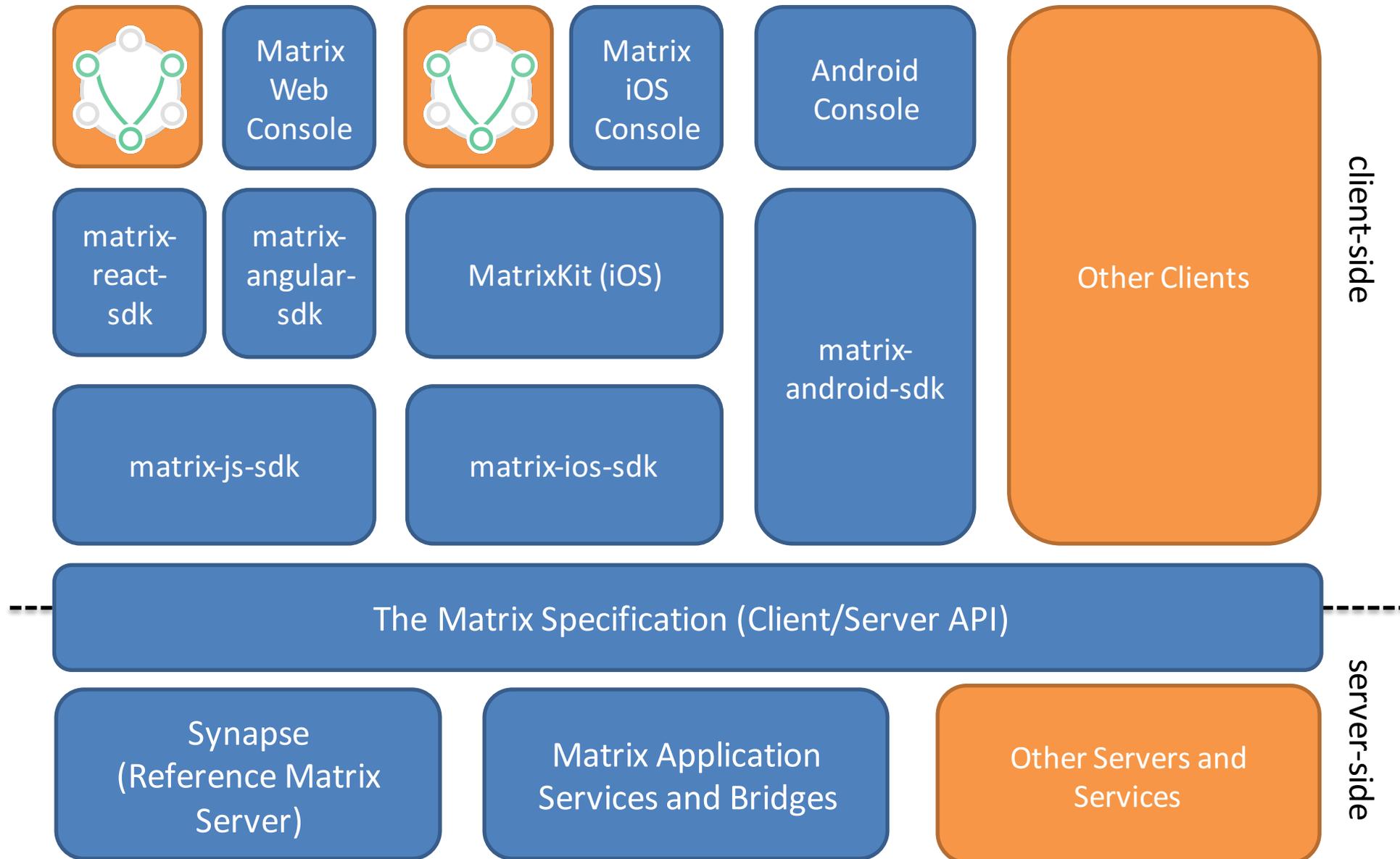
Why not XMPP?

- We wanted a fresh start with a higher level of functionality in the baseline spec:
 - Decentralised conversation history as the first class citizen, not message passing / pubsub
 - Group conversation as a first class citizen
 - E2E crypto as a first class citizen (we're not there yet though)
 - HTTP+JSON as the baseline API (**but you can use other transports too!**)
 - Stronger focus on defragmentation and bridging (hence the name “matrix”).

Matrix Architecture



The Matrix Ecosystem



What do you get in the spec?

- Decentralised conversation history (timeline and key-value stores)
- Group Messaging
- VoIP signalling for WebRTC
- Server-side push notification rules
- Server-side search
- Read receipts, Typing Notifs, Presence
- Synchronised read state and unread counts
- Decentralised content repository
- “Account data” for users per room
- E2E Encryption (real soon now)

How does it work?

<https://matrix.org/#about>

Clients

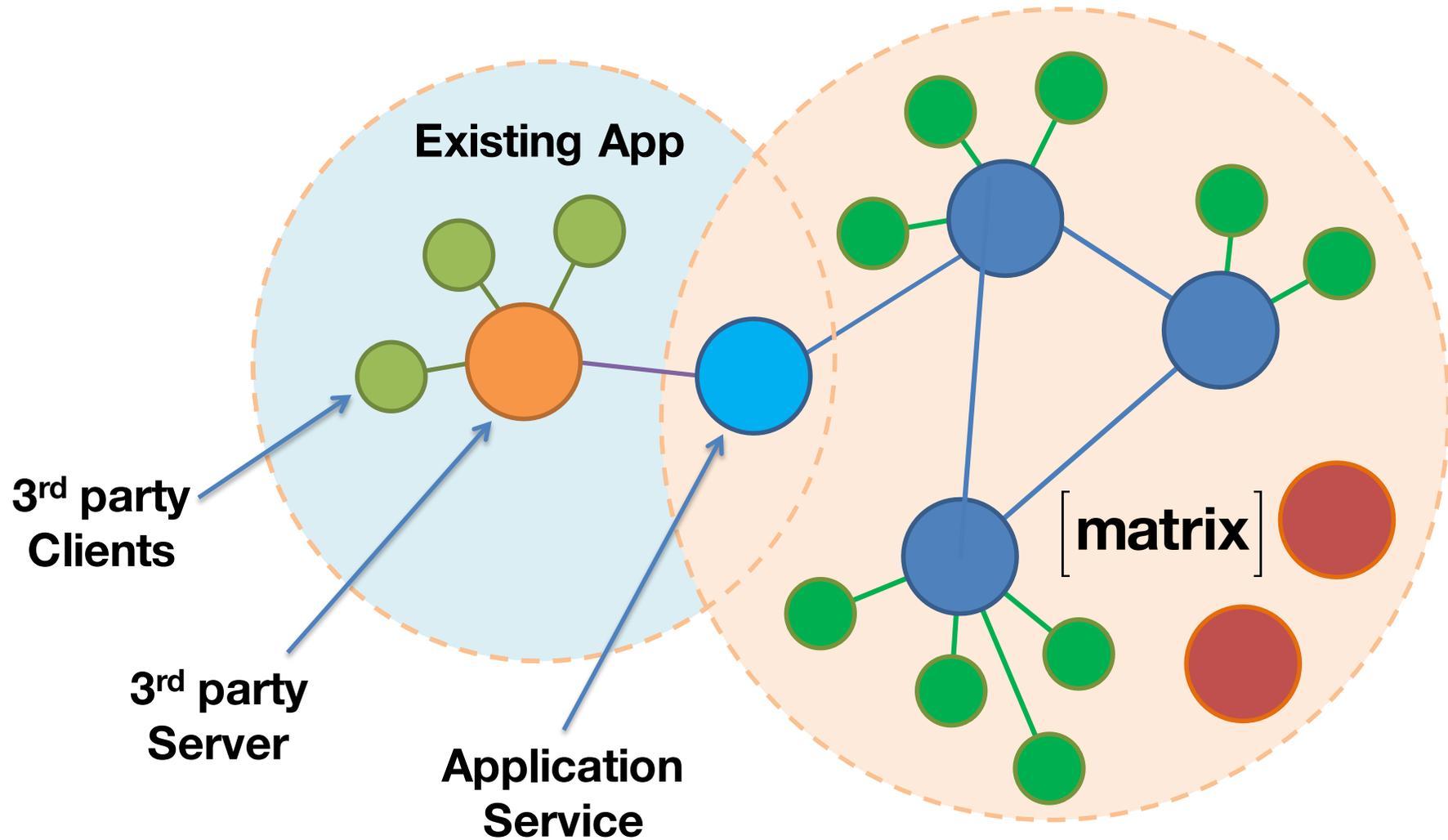
- 20 matrix clients (that we know about)
 - Ranging from text UIs (**Weechat**, Emacs(!))
 - ...to desktop apps (Tensor, Quaternion, Pidgin)
 - ...to native mobile apps (Console)
 - ...to glossy web clients (**Vector**)
 - ...to protocol proxies (**PTO**)
- Over 10 client-side SDKs:
 - Official: JS, React, iOS, Android
 - Semi-official: Python, Perl5
 - Community: Erlang, Ruby, Lisp, Elixir, Haskell, Rust...

Home servers

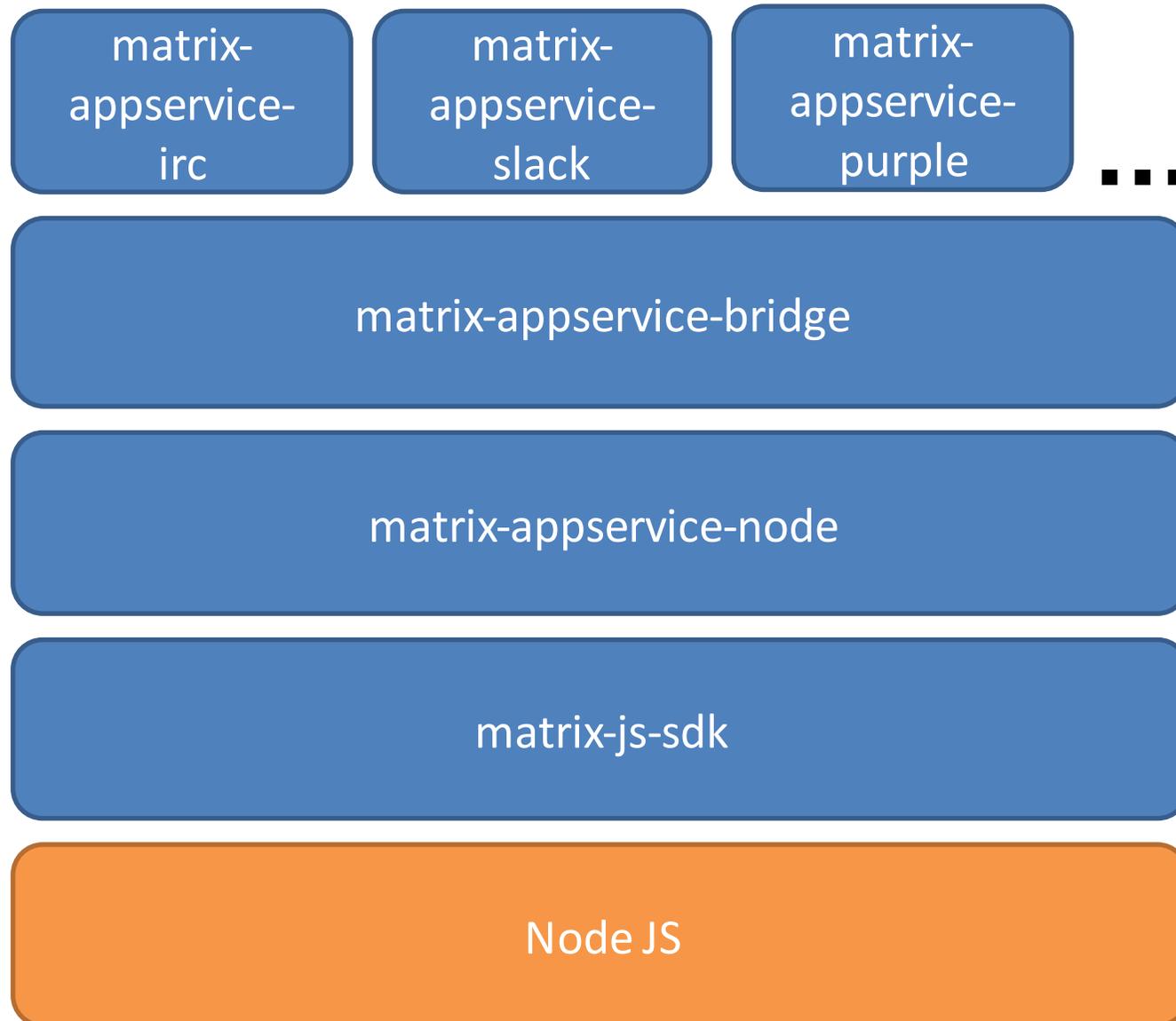
- **Synapse**: the original reference Matrix home server implementation.
 - 30K lines of Python/Twisted.
 - Lots of perf and maintainability challenges...
- **Dendron**: next-generation reference impl
 - 480(!) lines of Golang (it's 2 weeks old)
 - Wraps synapses, incrementally migrating endpoints
Built for scalability, perf and maintainability.
- BulletTime (Go), Pallium (Go), Ruma (Rust), jSynapse (Java) experiments from the community

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Bridges and Integrations

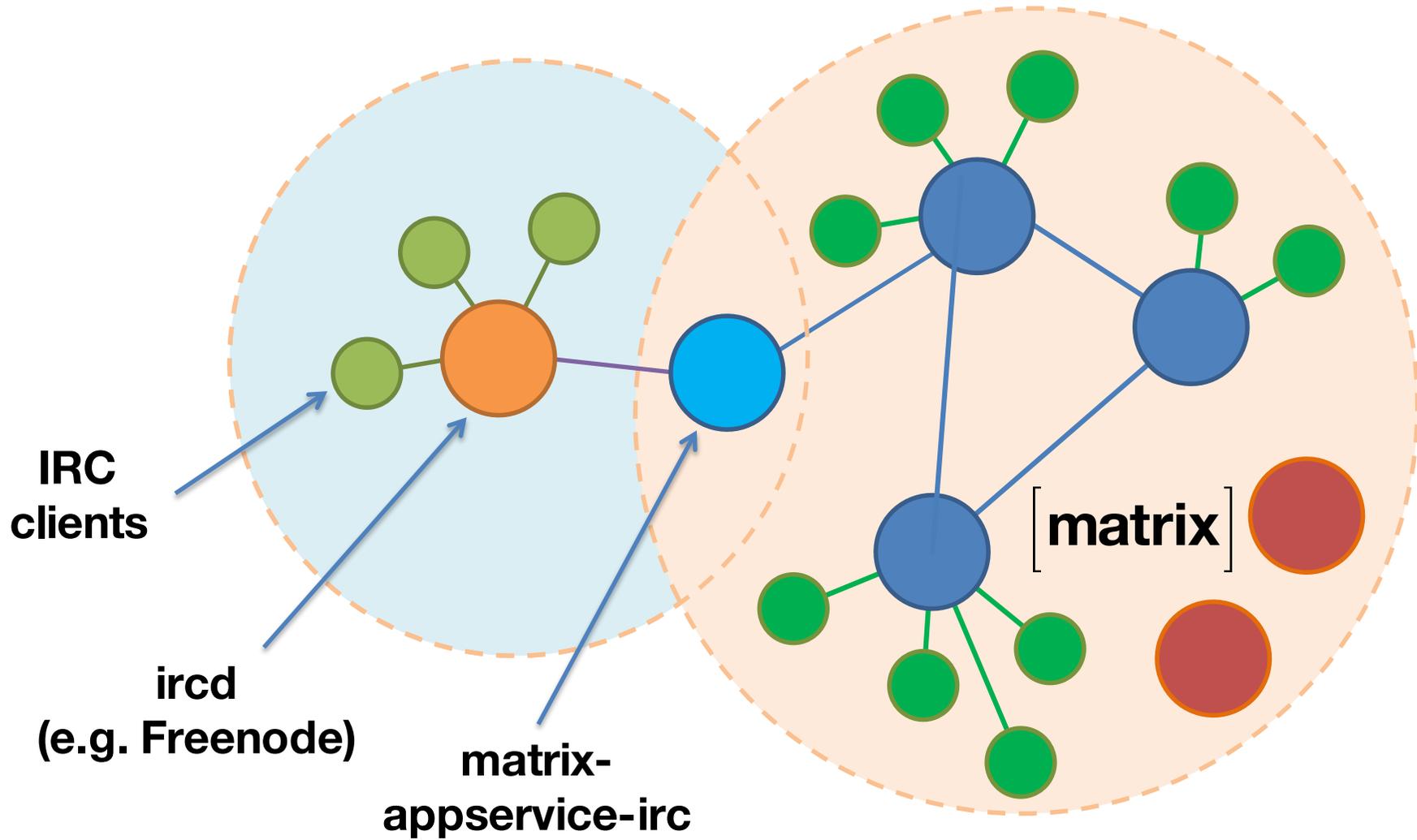


Typical Bridging Stack



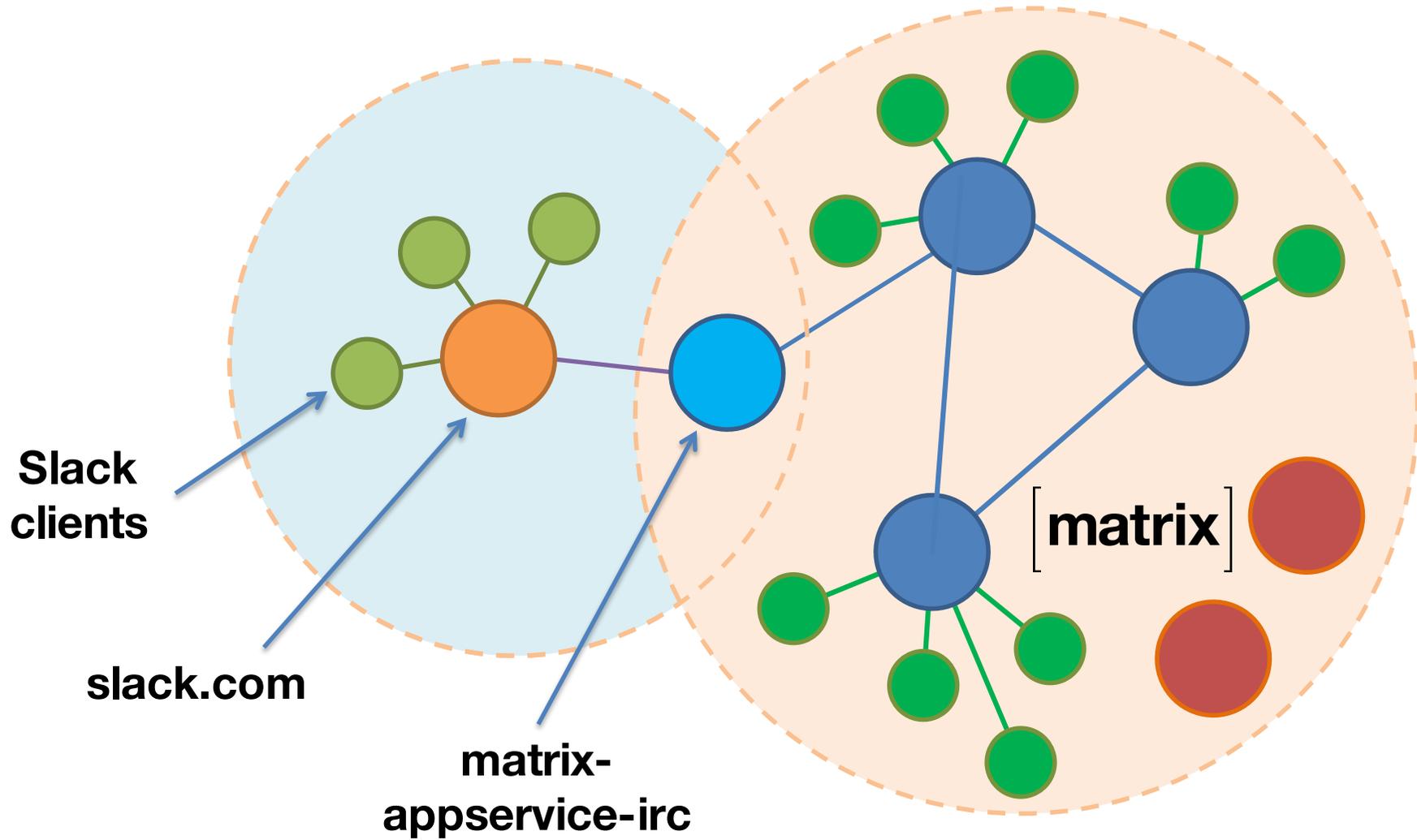
Matrix to IRC

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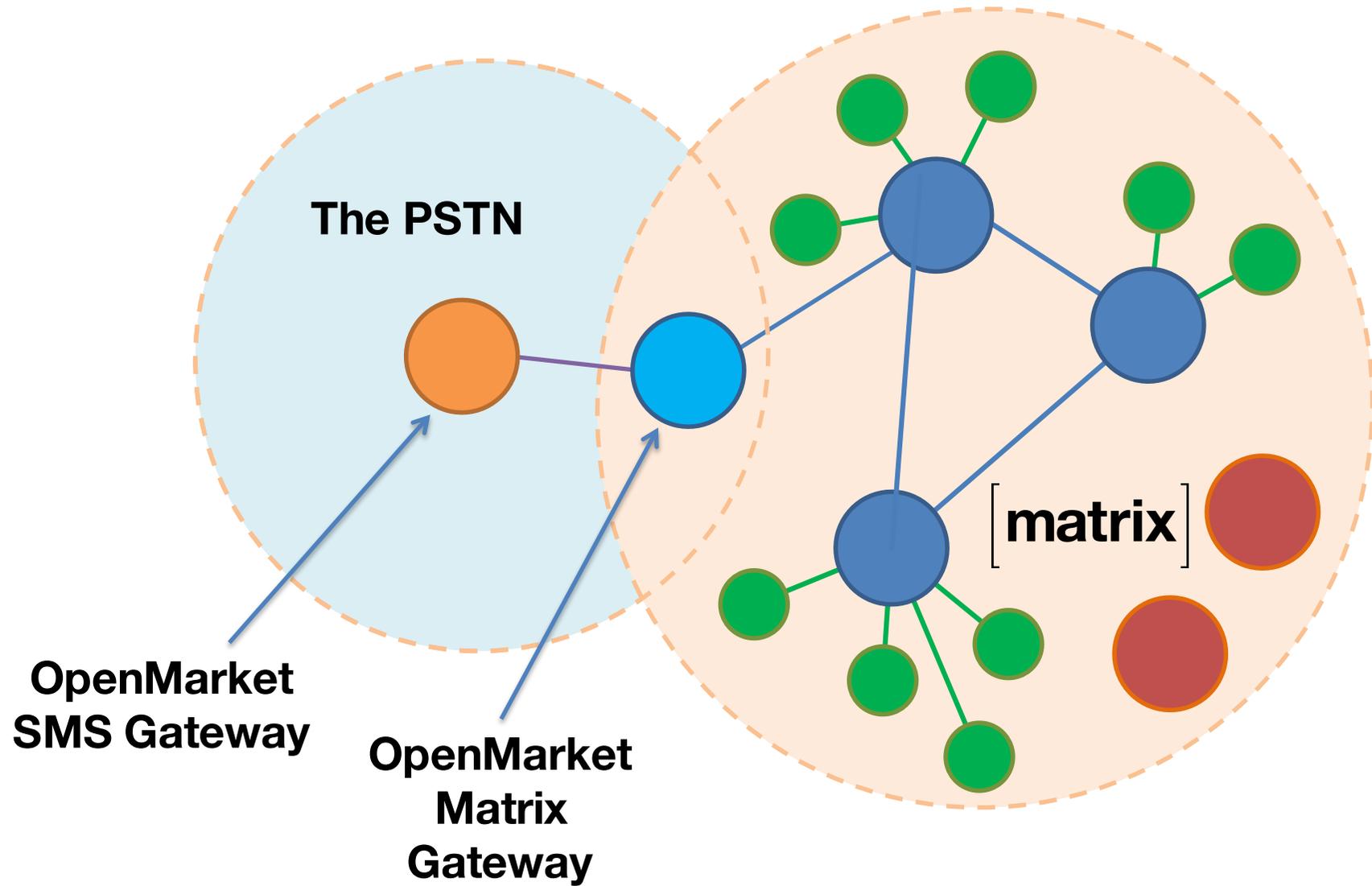
Matrix to slack

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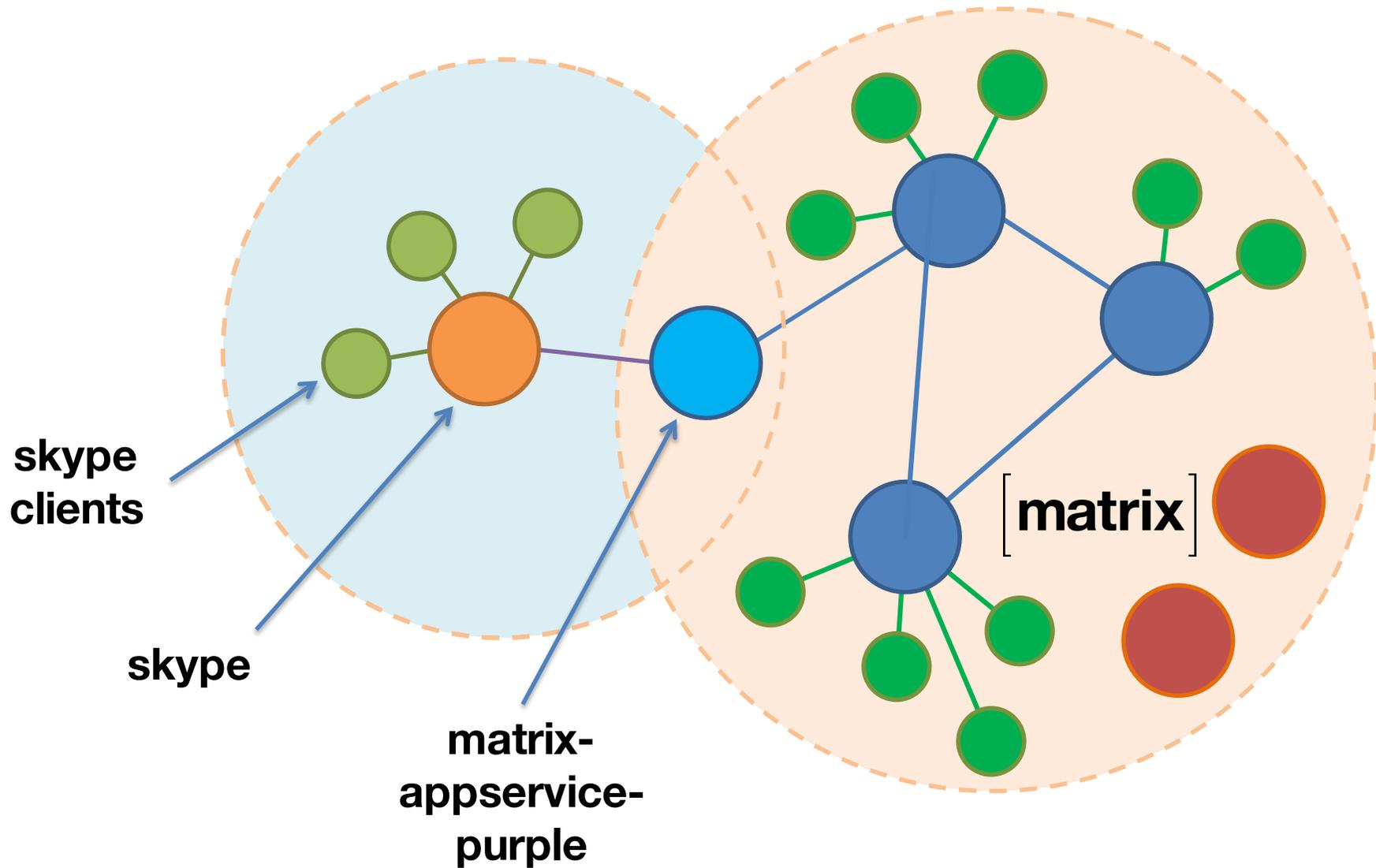
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Matrix to SMS



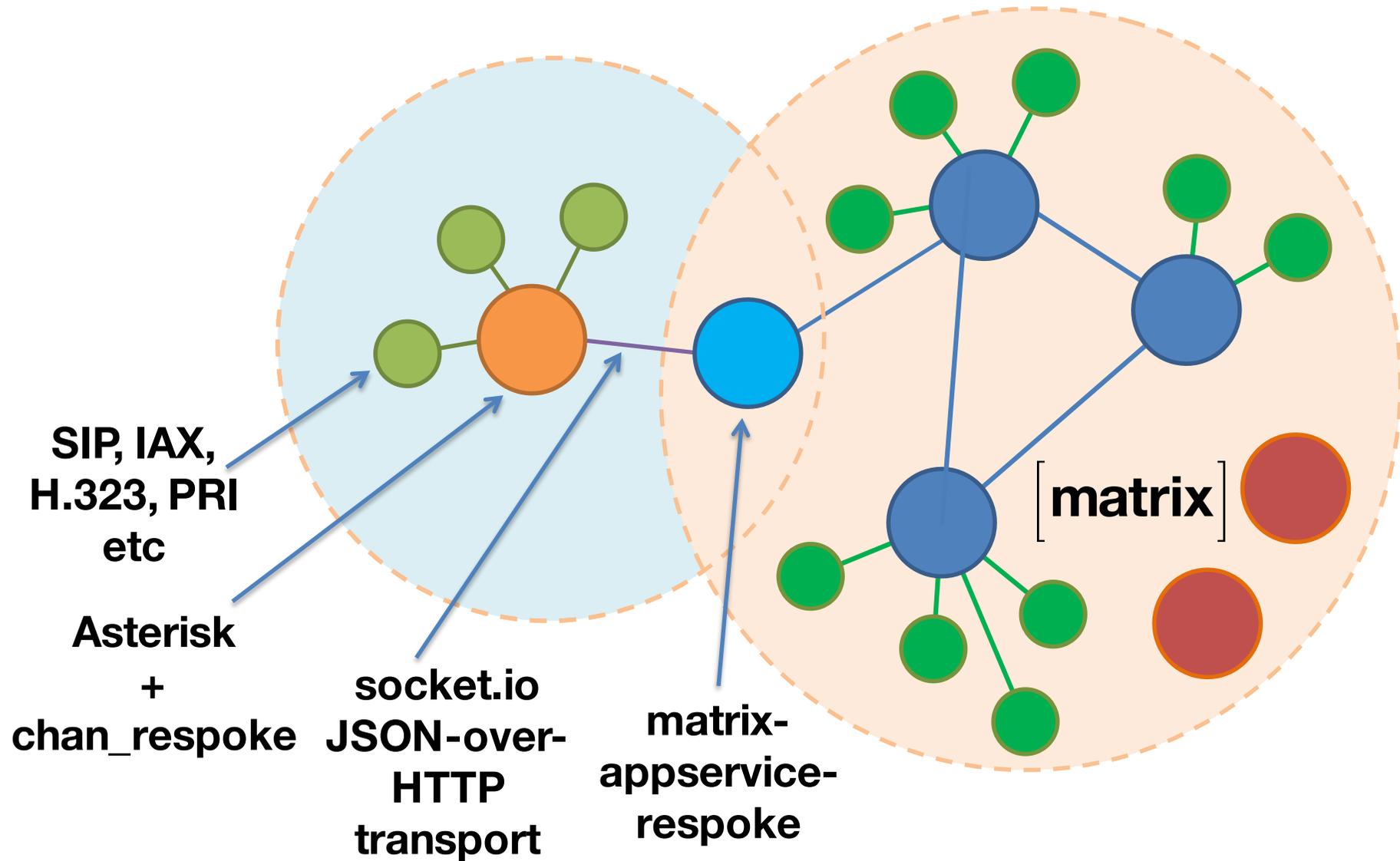
Matrix to Skype, Lync, Facebook, AIM, ICQ...?!

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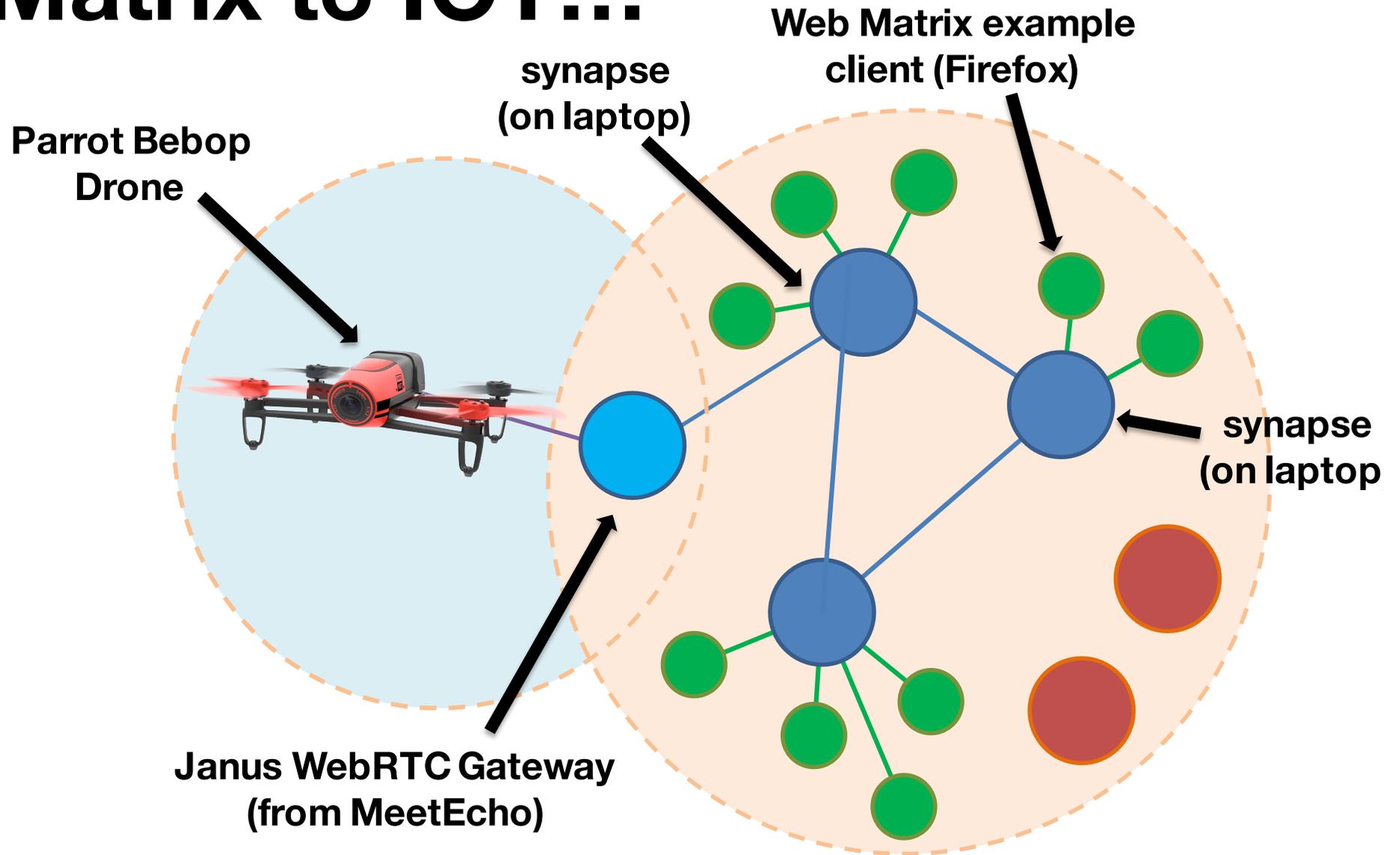


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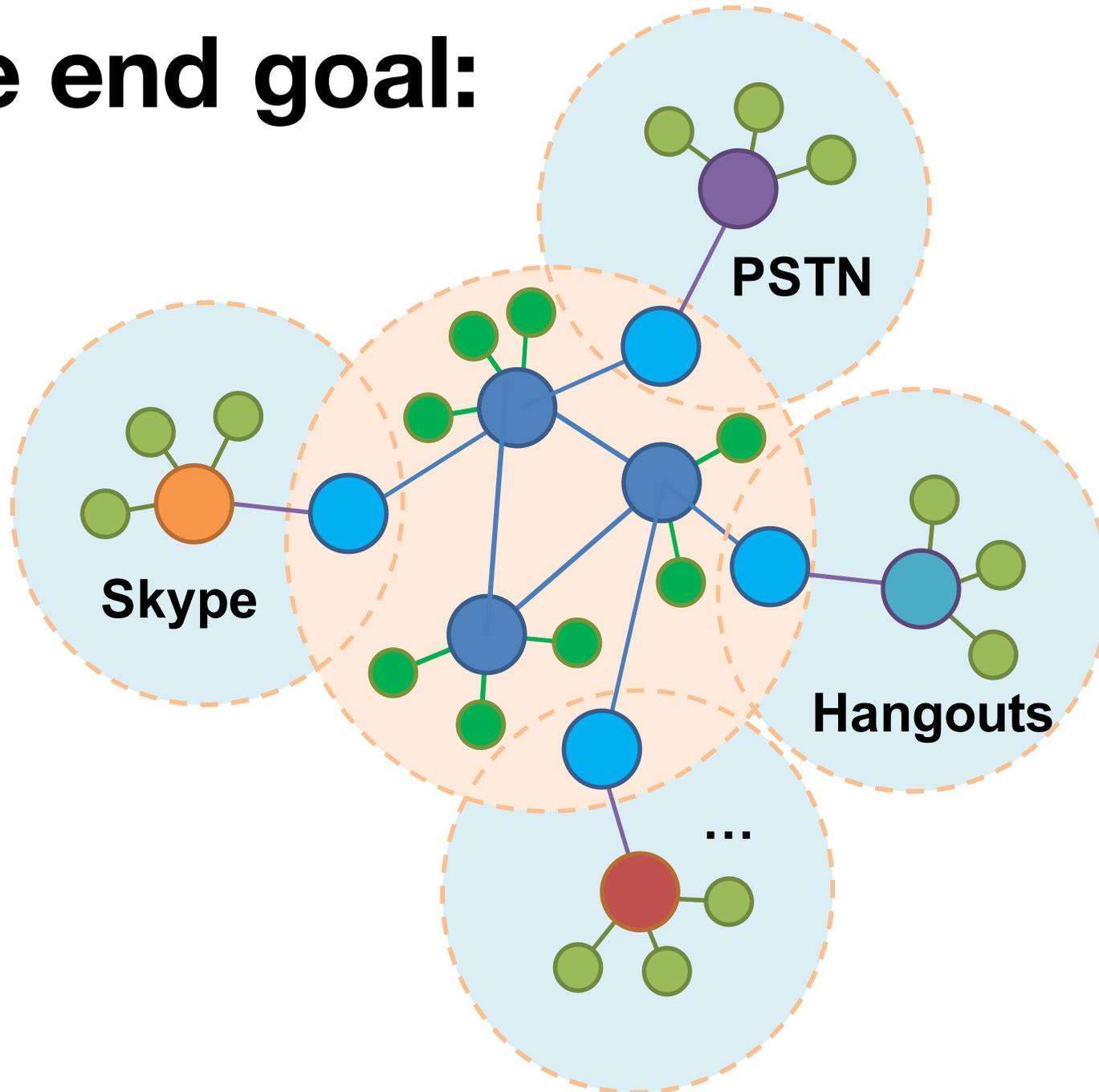
Matrix to Asterisk



Matrix to IoT...



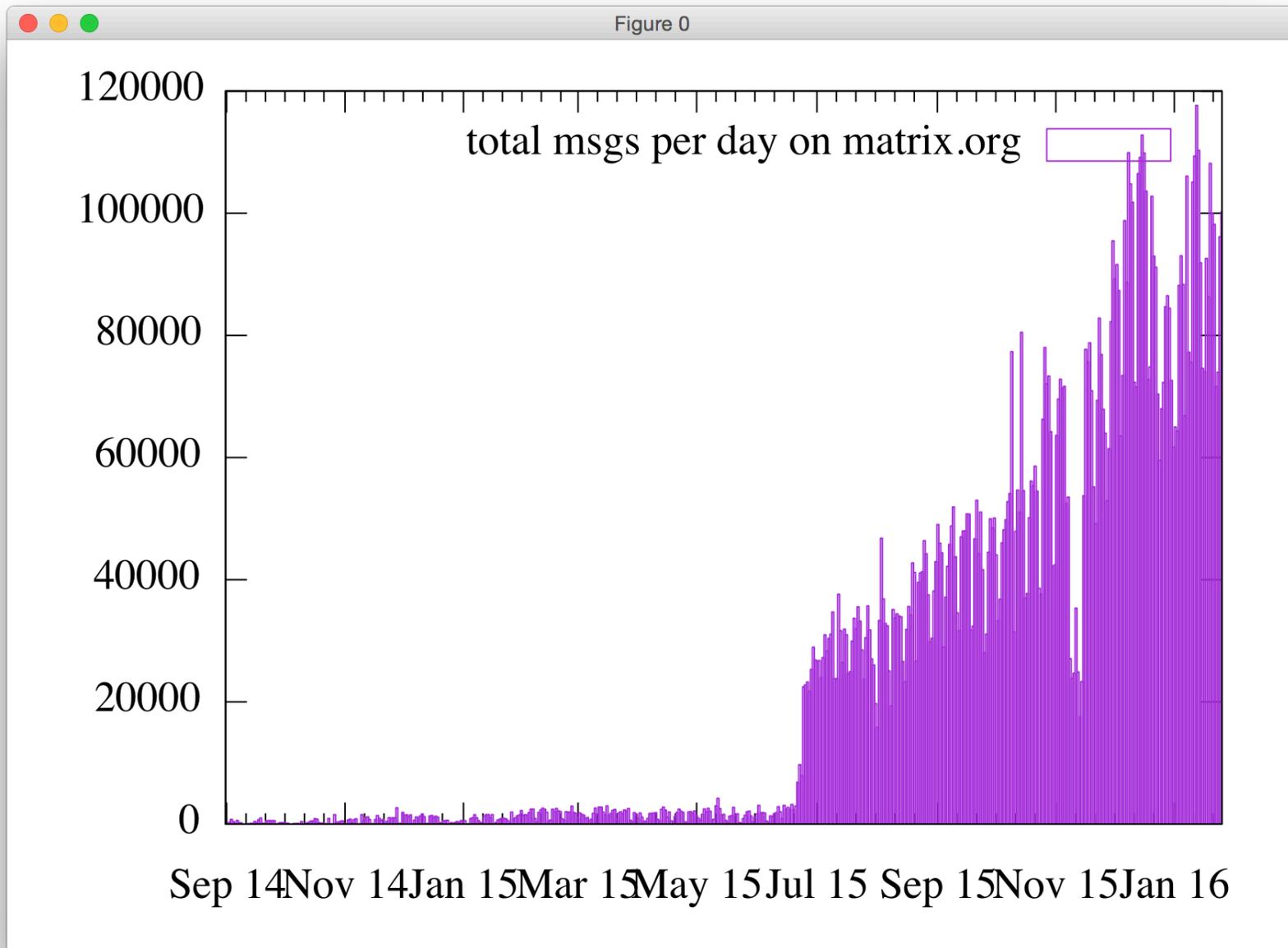
The end goal:



Community Status

- Started out in Sept 2014
- Currently in late beta
- ~120K user accounts on the Matrix.org homeserver (many of these are bridged)
- ~100K messages per day
- ~300 federated servers

Community Status



What's left?

- Rolling out End-to-end Encryption
- Threading
- Message tagging (e.g. “Like” support)
- Group ACLs
- File tagging and management
- Decentralised identity
- “Fixing spam”

End to End Encryption with Olm

- **Apache License C++11 implementation of an Axolotl-style ratchet, exposing a C API.**
- **Axolotl is Open Whisper System's better-than-OTR cryptographic ratchet, as used by TextSecure, Pond, WhatsApp etc.**
- **Supports encrypted asynchronous group communication.**
- **130KB x86-64 .so, or 208KB of asm.js**

We need help!!

- **We need people to try running their own servers and join the federation.**
- **We need people to run gateways to their existing services**
- **We need feedback on the APIs.**
- **Consider native Matrix support for new apps**
- **Follow [@matrixdotorg](https://twitter.com/matrixdotorg) and spread the word!** 

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Thank you!

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