Proposing an open interoperable signaling layer for WebRTC

matthew@matrix.org

There are two ways to use WebRTC:

1. Contextual communication (e.g. talking to your bank about your overdraft)

2. 'Free' communication (e.g. simply having a conversation)

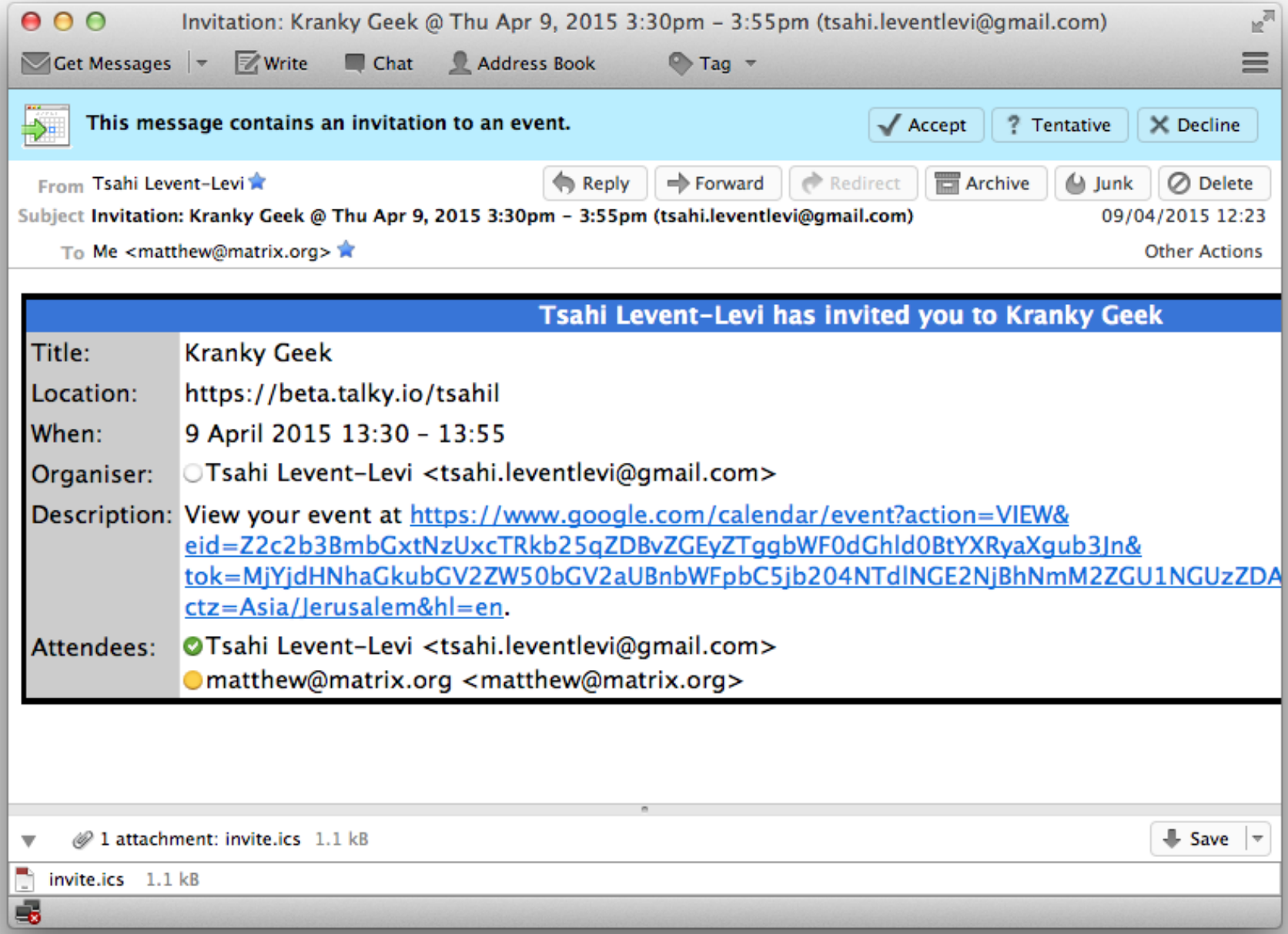
matrix

There are two ways to use WebRTC:

1. Contextual communication (e.g. talking to your bank about your overdraft)

2. 'Free' communication (e.g. simply having a conversation)

What does it mean to "call someone via WebRTC"?


Invitation: Kranky Geek @ Thu Apr 9, 2015 3:30pm – 3:55pm (tsahi.leventlevi@gmail.com)
Get Messages
Write
Chat
Address Book
Tag
This message contains an invitation to an event.
Accept
Tentative
Decline
From Tsahi Levent-Levi
Reply
Forward
Redirect
Archive
Junk
Delete
Subject Invitation: Kranky Geek @ Thu Apr 9, 2015 3:30pm – 3:55pm (tsahi.leventlevi@gmail.com)
09/04/2015 12:23
To Me <matthew@matrix.org>
Other Actions
Tsahi Levent-Levi has invited you to Kranky Geek
Title: Kranky Geek
Location: https://beta.talky.io/tsahil
When: 9 April 2015 13:30 – 13:55
Organiser: Tsahi Levent-Levi <tsahi.leventlevi@gmail.com>
Description: View your event at https://www.google.com/calendar/event?action=VIEW&
eid=Z2c2b3BmbGxtNzUxcTRkb25qZDBvZGEyZTggbWF0dGhld0BtYXRyaXgub3Jn&
tok=MjYjdHNhaGkubGV2ZW50bGV2aUBnbWFpbC5jb204NTdlNGE2NjBhNmM2ZGU1NGUzZDA
ctz=Asia/Jerusalem&hl=en.
Attendees: Tsahi Levent-Levi <tsahi.leventlevi@gmail.com>
matthew@matrix.org <matthew@matrix.org>
1 attachment: invite.ics 1.1 kB
Save
invite.ics 1.1 kB

matrix

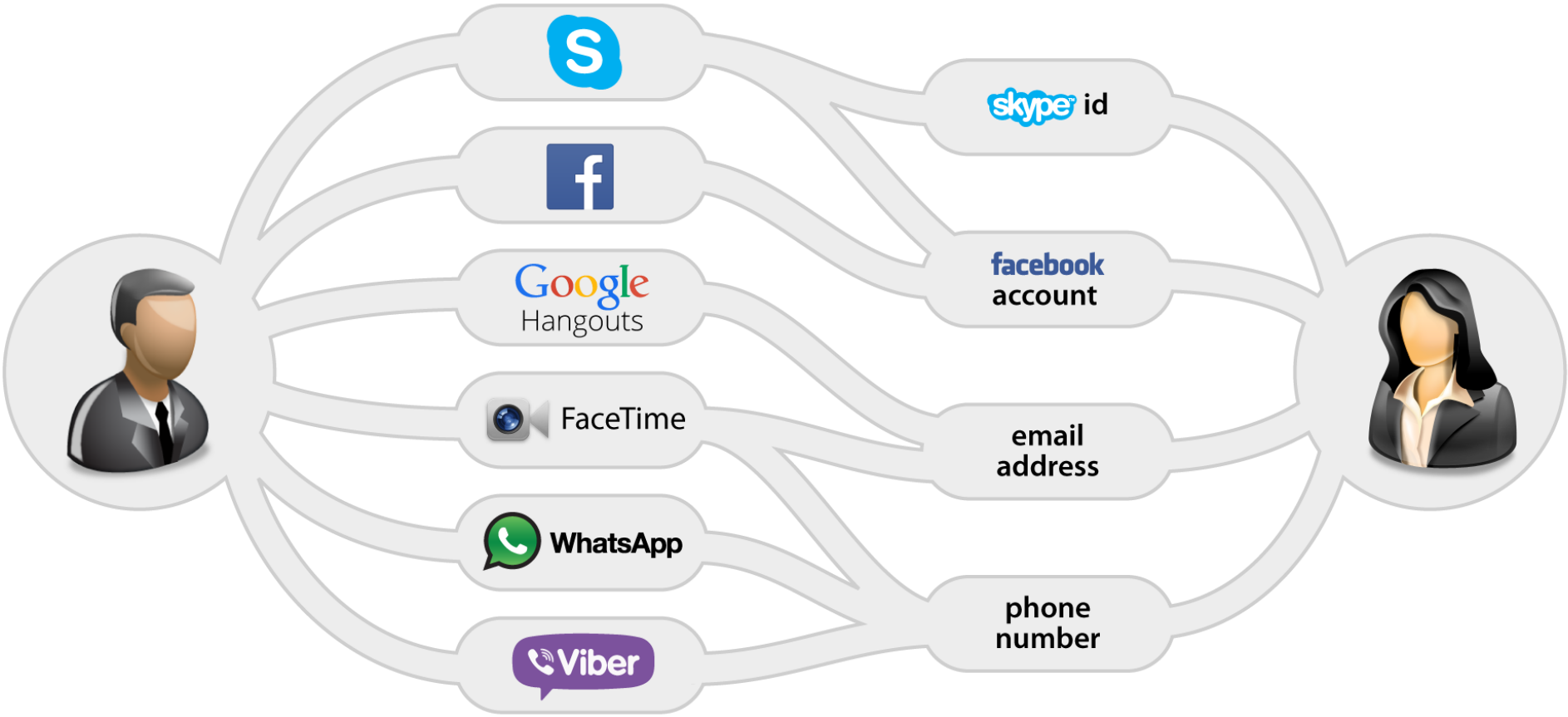
Title:	Kranky Geek
Location:	https://beta.talky.io/tsahil
When:	9 April 2015 13:30 - 13:55
Organiser:	Tsahi Levent-Levi

Why should I have to use Tsahi's app?

Why should I trust Tsahi's app?

Why should the data for this call get trapped in Tsahi's app?

How do I know how to contact Tsahi in future?


Google
Hangouts
FaceTime
WhatsApp
Viber
skype id
facebook
account
email
address
phone
number

The problem is that WebRTC deliberately specifies no standard signalling protocol.

Current signalling protocol options include:

- SIP
- XMPP
- WebRTC Data Channel
- Lots and lots of custom HTTP APIs

SIP:

matrix

Pros:

- Integrates with existing VoIP

Cons:

- Heavyweight
- Complicated specification
- Complicated stack
- Not web-native stack
- Buys little over HTTP

XMPP/Jingle:

matrix

Pros:

- Slightly saner than SIP.
- Extensibility

Cons:

- Baseline is way too minimal
- Not web-native stack
- Jingle has limited uptake
- XML.

HTTP APIs:

matrix

Pros:

- Web-native! Simple!

Cons:

- Everyone's written their own
- Most are proprietary/closed
- Variable quality
- Almost none of them interop
- None of them federate

Enter Matrix:

Non-Profit
Open Source / Open Standard
HTTP Federated Signalling API

Matrix

matrix

Pros:

- Simple HTTP Signalling API
- Open Federation
- Open Standard + Open Impls
- Decentralised conversations
- Group conversations always
- Extensible (VoIP, IM, IoT…)
- Identity Agnostic
- Secure (E2E Crypto)

Cons:

- It's Beta (since Dec 2014)

matrix

Won **Audience Choice** & Best Social Integration awards at WebRTC Expo 2014 and **Best Innovation** at WebRTC Paris 2014

For the geeks:

matrix

Open
Decentralised
Persistent
Eventually Consistent
Cryptographically Secure
Messaging Database
with JSON-over-HTTP API.

Architecture

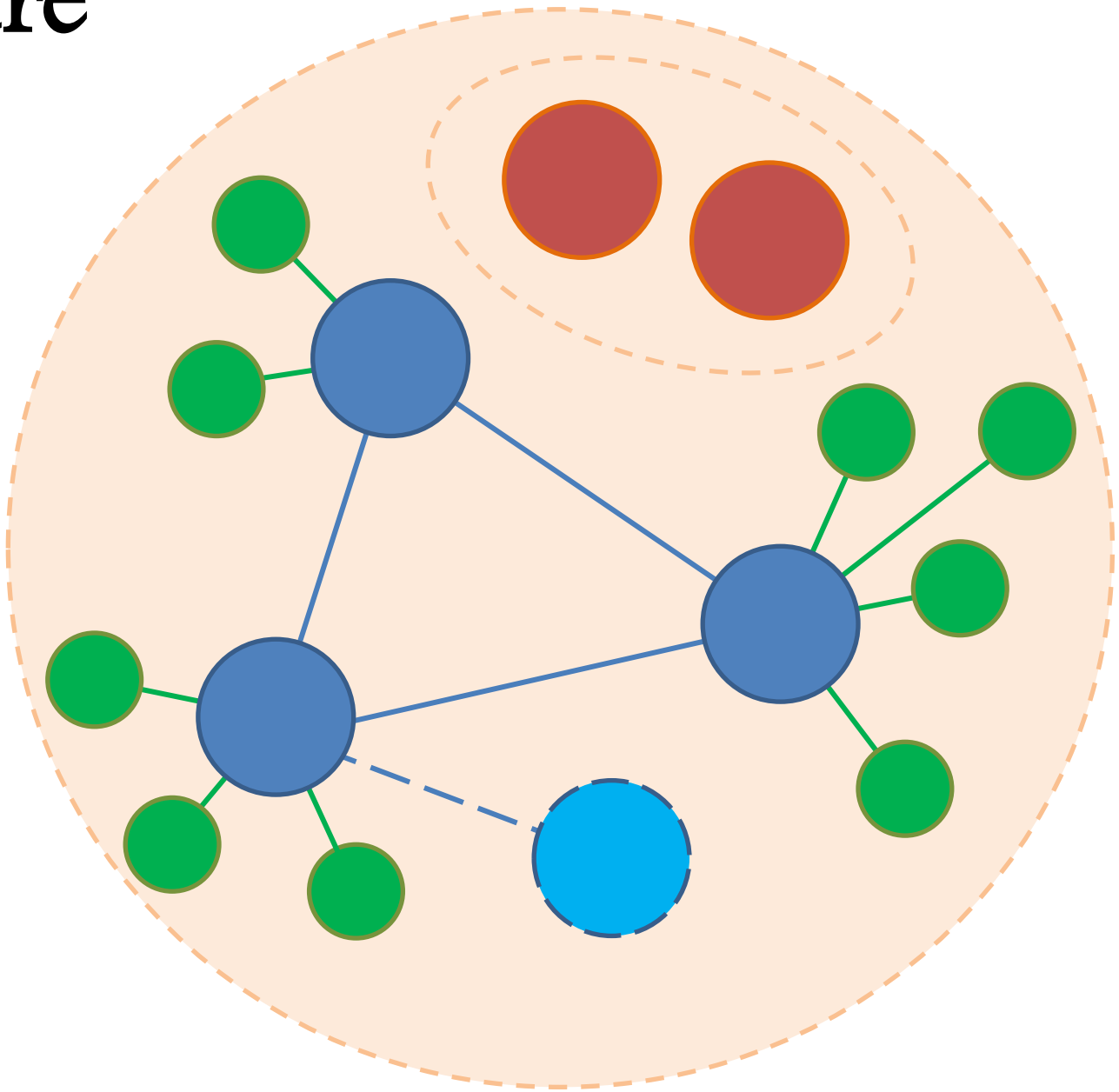
matrix

Clients

Home Servers

Identity Servers

Application Services

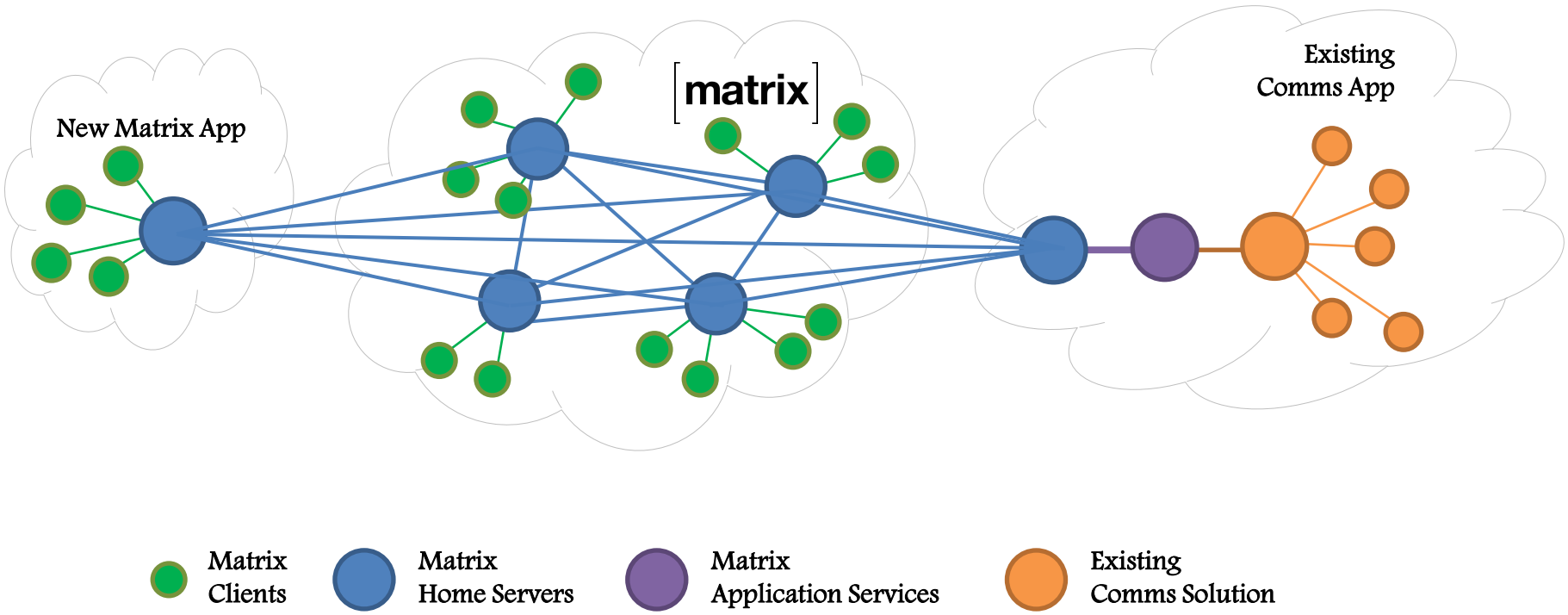


[matrix]

Functional Responsibility

- **Clients**: Talks simple HTTP APIs to homeservers to push and pull messages and metadata. May be as thin or thick a client as desired.
- **Homeservers**: Stores all the data for a user – the history of the rooms in which they participate; their public profile data.
- **Identity Servers**: Trusted clique of servers (think DNS root servers): maps 3rd party IDs to **matrix** IDs.
- **Application Services**: Optional; delivers application layer logic on top of Matrix (Gateways, Conferencing, Archiving, Search etc). Can actively intercept messages if required.

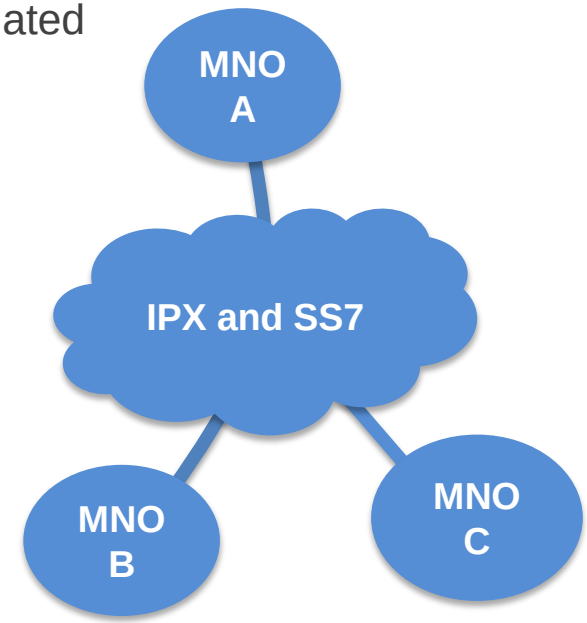
Architecture (Bridging)



The World Before Matrix

Telco

- Total pervasive ubiquity
- Universal interoperability
- QoS & carrier-grade availability
- Customer billing relationship
- SIM-based crypto-strong ID
- E.164
- Regulated



Internet

- Services need good IP connectivity
- Zero interoperability
- No QoS; best-effort availability
- Inconsistent billing relationships, if any
- Optional PKI-based crypto
- Fragmented ID systems
- Unregulated

© 2015 Matrix.org

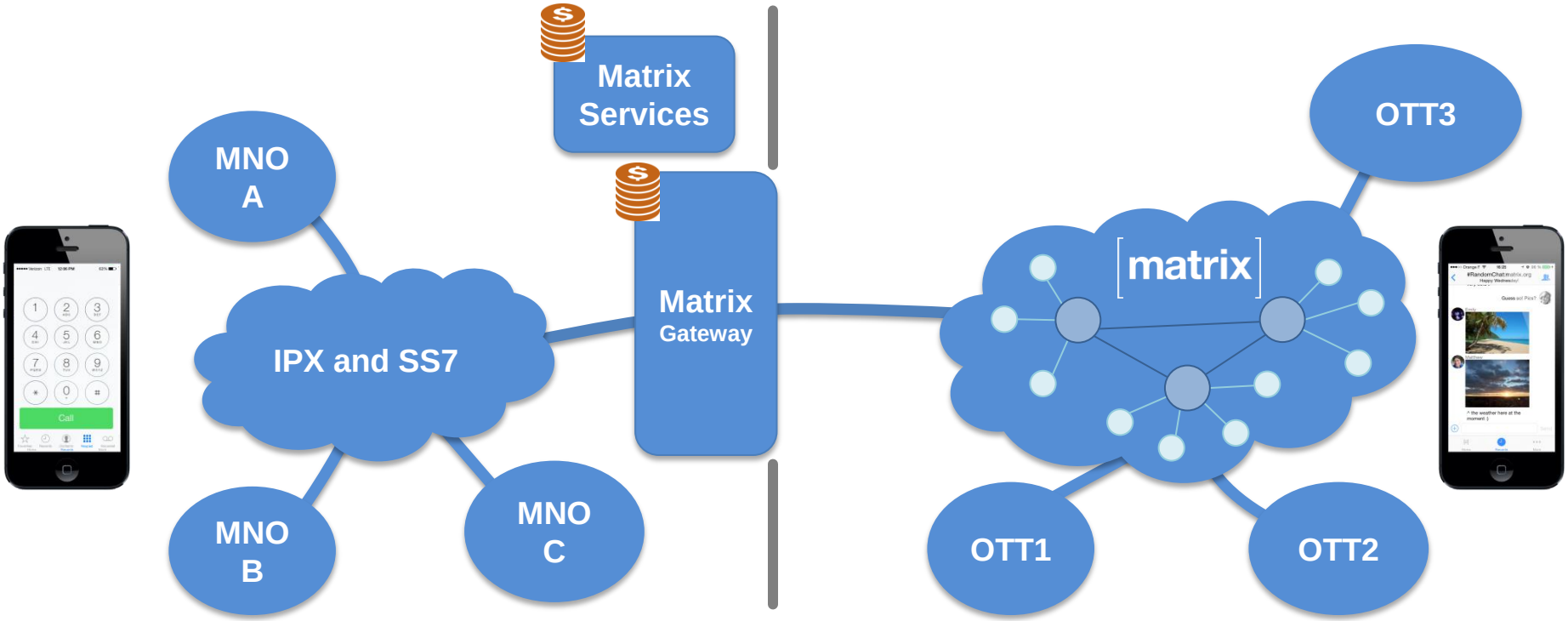
But Telcos are **perfectly** positioned to:

- **Host carrier-scale services** – be the Google or FB of the Matrix ecosystem!
- Be **primary driver** of Matrix from the outset
- Be the paid gateway for **PSTN connectivity** (call termination and "one-number" services)
- Bill customers for **premium services**

© 2015 Matrix.org

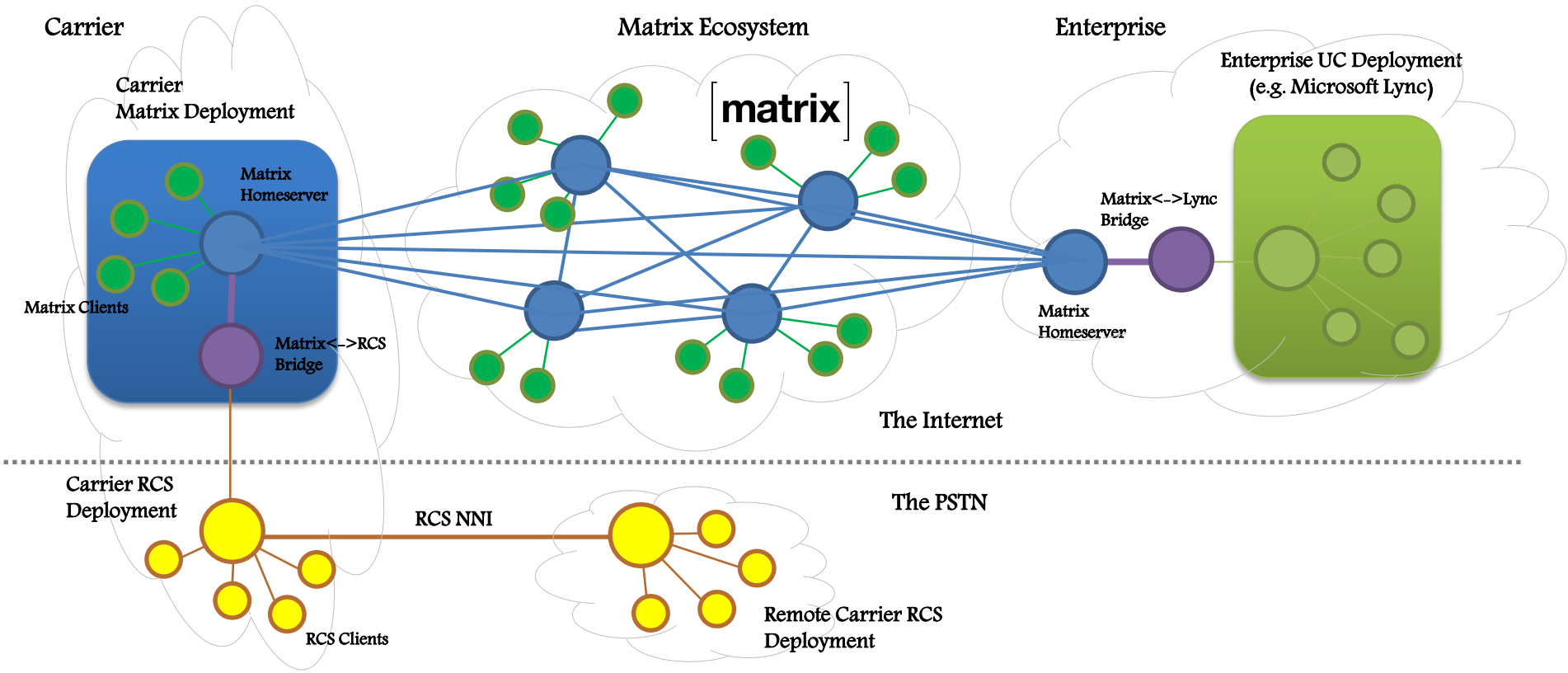
A world where Telcos leverage Matrix

- CSPs provide commercial carrier-grade Matrix services:
  - Carrier-grade consumer and enterprise **Matrix hosting**
  - Internet-friendly commercial **WebRTC <-> PSTN** connectivity
  - Branded "**One Number**" TuGo-style services extending the PSTN to the internet
  - **Premium VASs**: conferencing, archiving, search, transcription, ads, developer APIs...



© 2015 Matrix.org

Matrix with RCS/IMS



Demo

https://matrix.org/beta

matrix

Current Progress

- Funded May 2014
- Launched alpha Sept 2014
- Entered beta Dec 2014
- May 2014: v1.0 release?!
- Remaining:
  - Performance improvements in reference impls
  - Build more gateways
  - Finalise spec
  - End-to-End Encryption
  - v2 Client-Server API

We need help!!

- We need more partners to participate in Matrix.
- We need people to run their own servers and join Matrix.
- We need feedback on the APIs.
- We need more people to actually use it!

http://matrix.org

THANK YOU!

matrix: @matthew:matrix.org
mail: matthew@matrix.org
twitter: @matrixdotorg