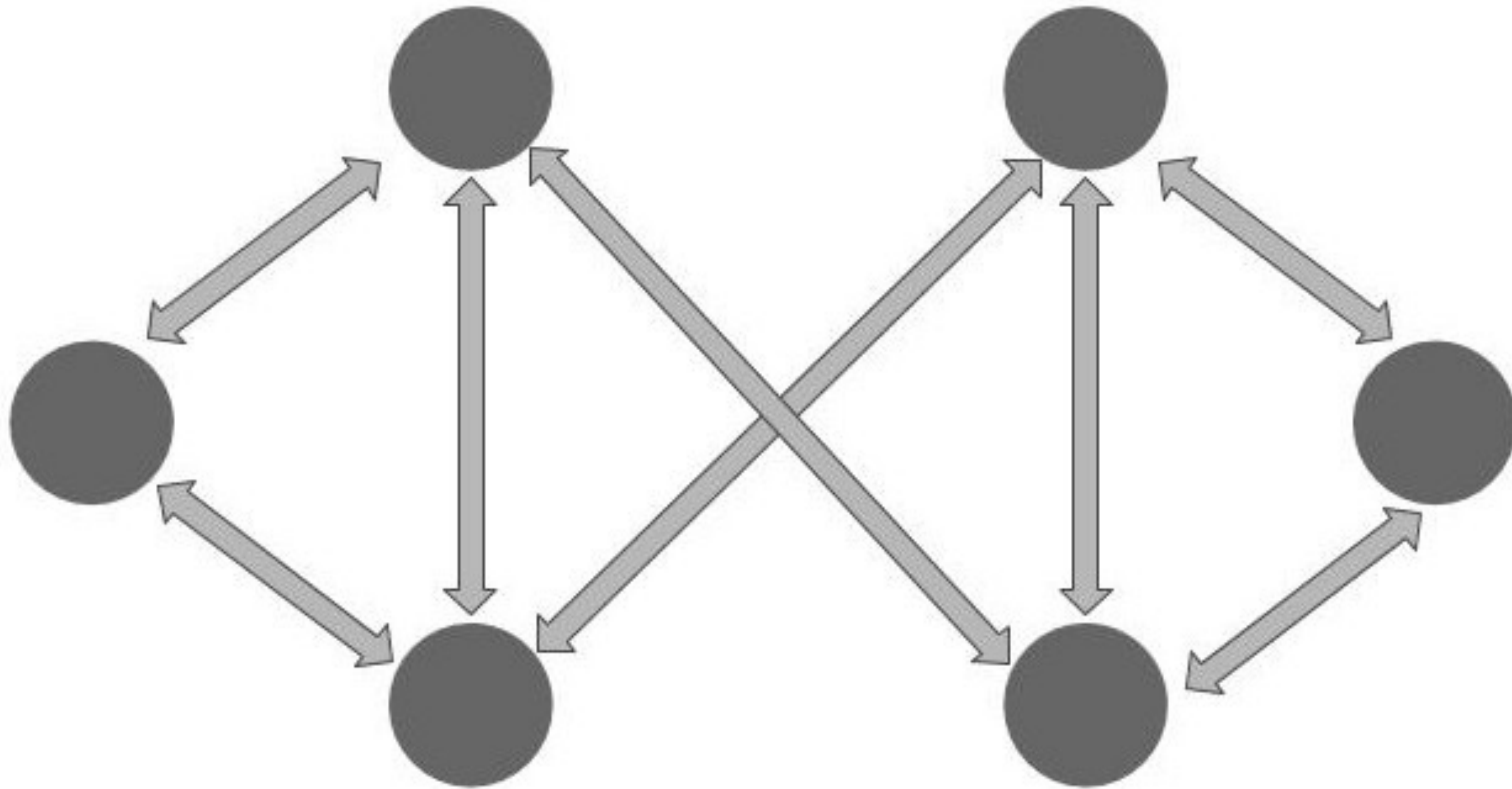


WebRTC in a decentralized environment

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De-centralized

No single control



Resilient

Intent to survive worst possible conditions

Image: [Sapling](#) by Jason Scragz. CC BY 2.0



Privacy-aware

Harder to control and snoop on user data



Secure

End-to-end encryption to avoid unauthorized access

Re-decentralize

Ask for a decentralized, secure and private internet with open access for everyone.



Internet has centralized parts

Undersea cables, root name servers, web servers

We can decentralize enough

Can we build a decentralized
communications application?

matrix.org + WebRTC

Standard for decentralized communication

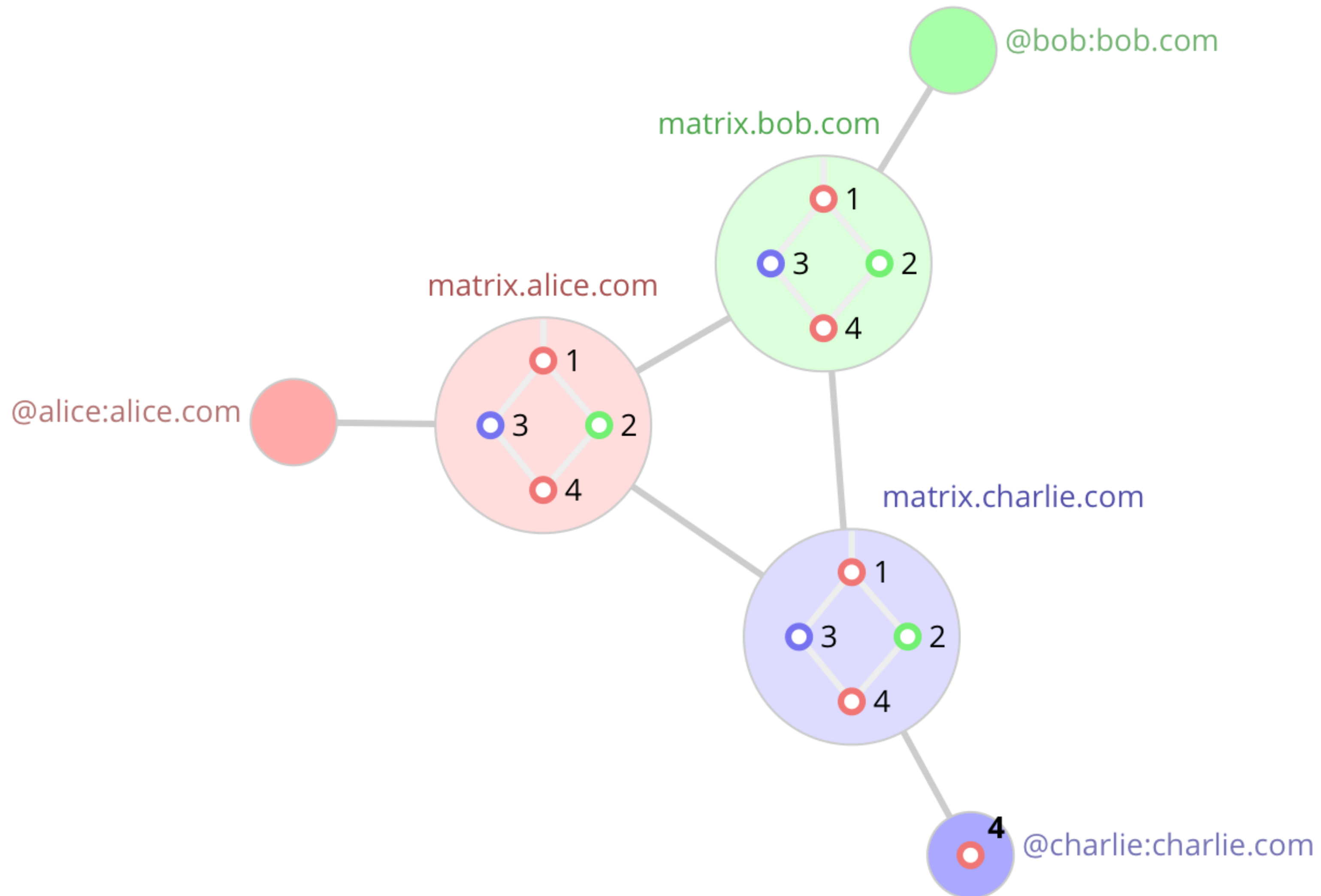
JSON API over HTTP

Specifications for secure distribution of data

Data persistence

Open federation of servers

How matrix works



Peer-to-peer WebRTC

Use matrix for signalling. Distributed discovery.
Once connected, use data channels to exchange data.

About data channels

`RTCPeerConnection.createDataChannel()` -> `RTCDataChannel`

Uses SCTP (message-oriented, flow and congestion control)

Send files as blobs

Works with JavaScript primitives, like `ArrayBuffer`.

Using RTCDataChannel

```
var pc = new RTCPeerConnection();

// Connect to peer through matrix... Then...
var dchannel = pc.createDataChannel("hello", options);

dchannel.onmessage = function (evt) {
    console.log("Received:", evt.data);
};

dchannel.onopen = function () {
    dataChannel.send("Hello, World!");
};
```


Trade-offs

Cannot initially support more than 3 users in a call.

Cannot directly record stream on the server.

Needs significantly more effort than a centralised signalling server.

Quick Fix: multi-party environments

matrix.org + SFU + WebRTC

Use matrix rooms for grouping participants

Use SFU to mix and broadcast traffic

Use WebRTC to build clients across platforms

Alternatives?

The SAFE network

A decentralized internet

Just decentralizing is not enough

You need to deliver value.

Read more:

“Why decentralize technology?”

<https://kaustavdm.in/why-decentralize-technology.html>

Thanks!

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