Decentralized Networked Communities As Essential Infrastructure

By Christopher Lemmer Webber

- **Introduction**
- Social Centralization, Social Harm
- Federation, Past and Present
- The Future of Decentralization
- Essential Infrastructure

Who am I?

- FOSS activist (CC tech lead, etc)
- Standards author/editor
- ActivityPub co-author
- Spritely founder / lead dev

ActivityPub

Supporting Individuals

Supporting Communities

Supporting Human Rights

- Introduction
- **Social Centralization, Social Harm**
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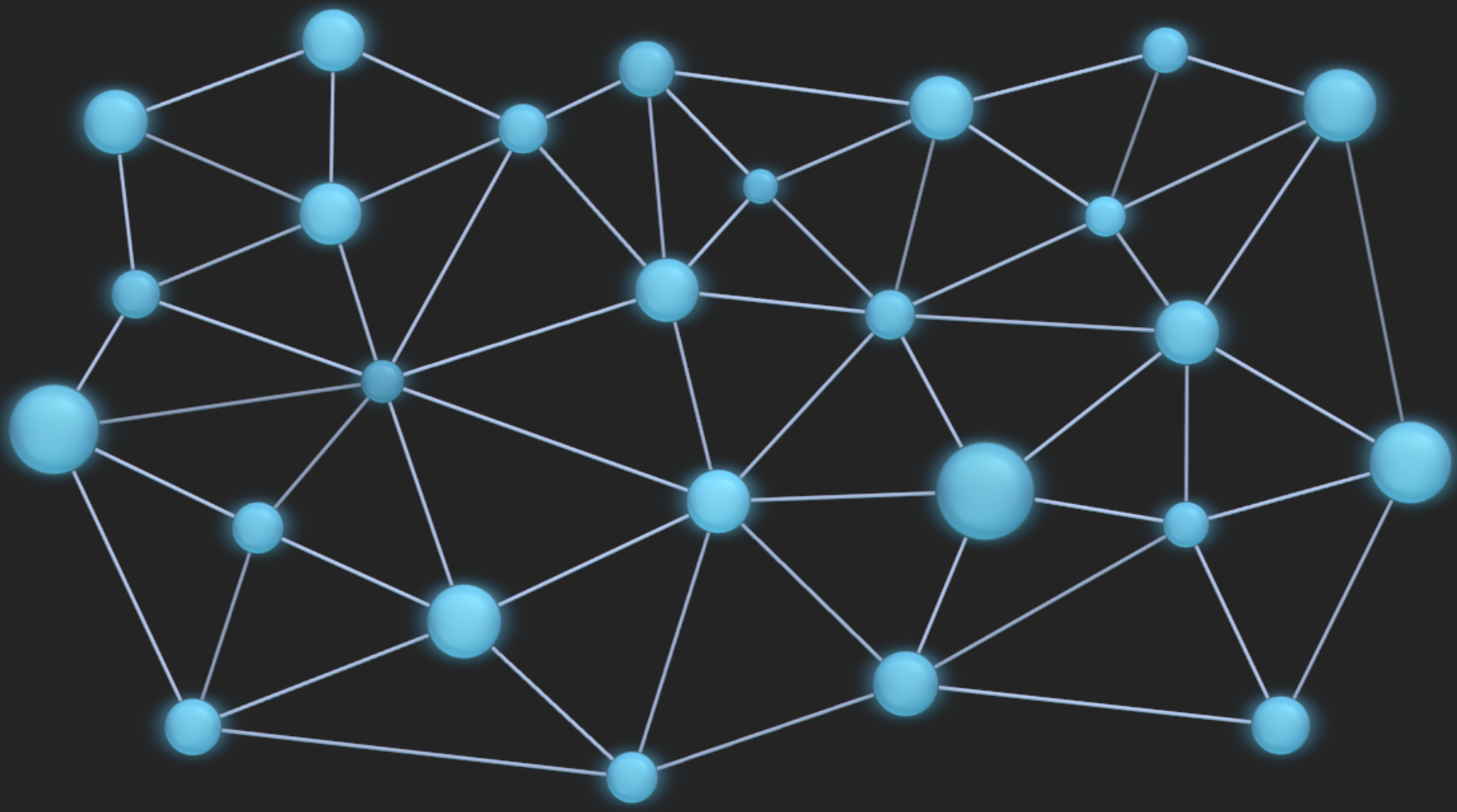
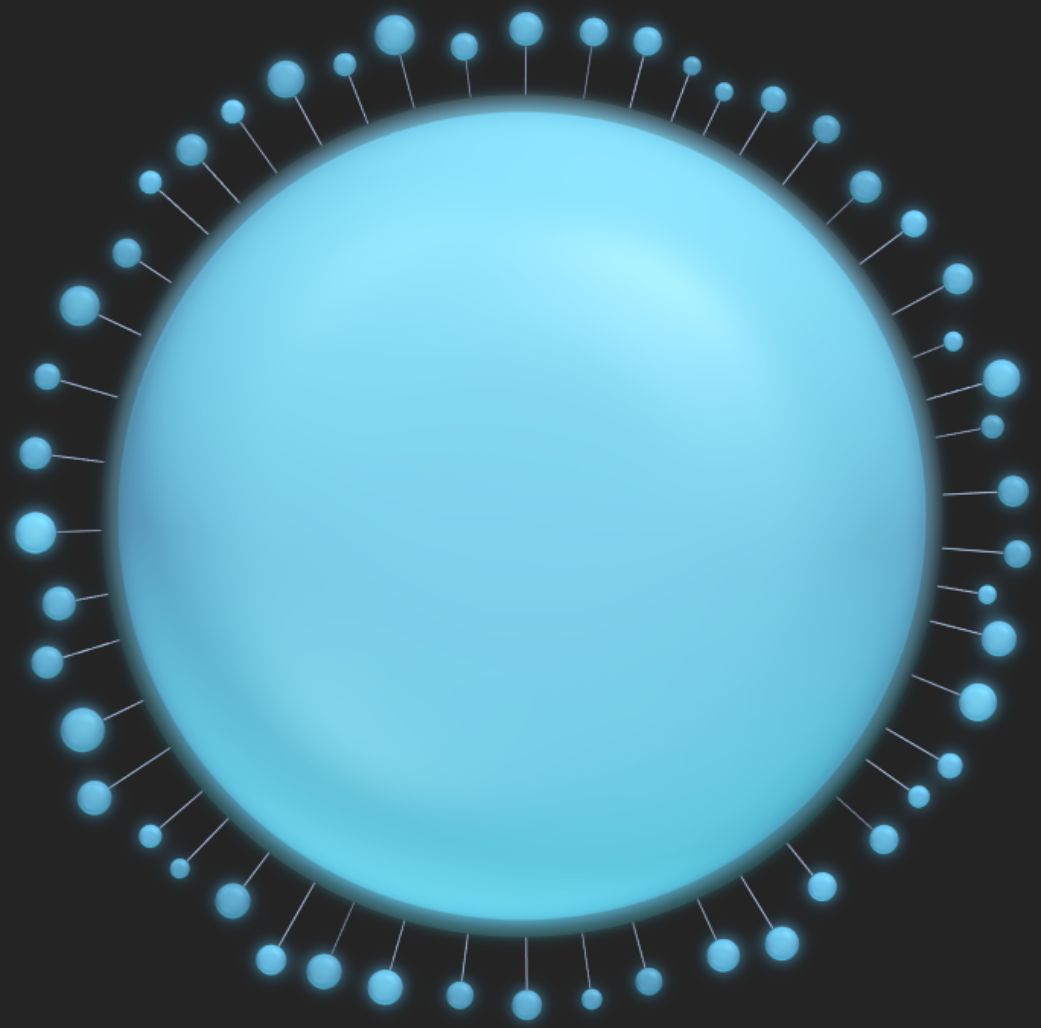
Centralized Social Networks

cause social harm





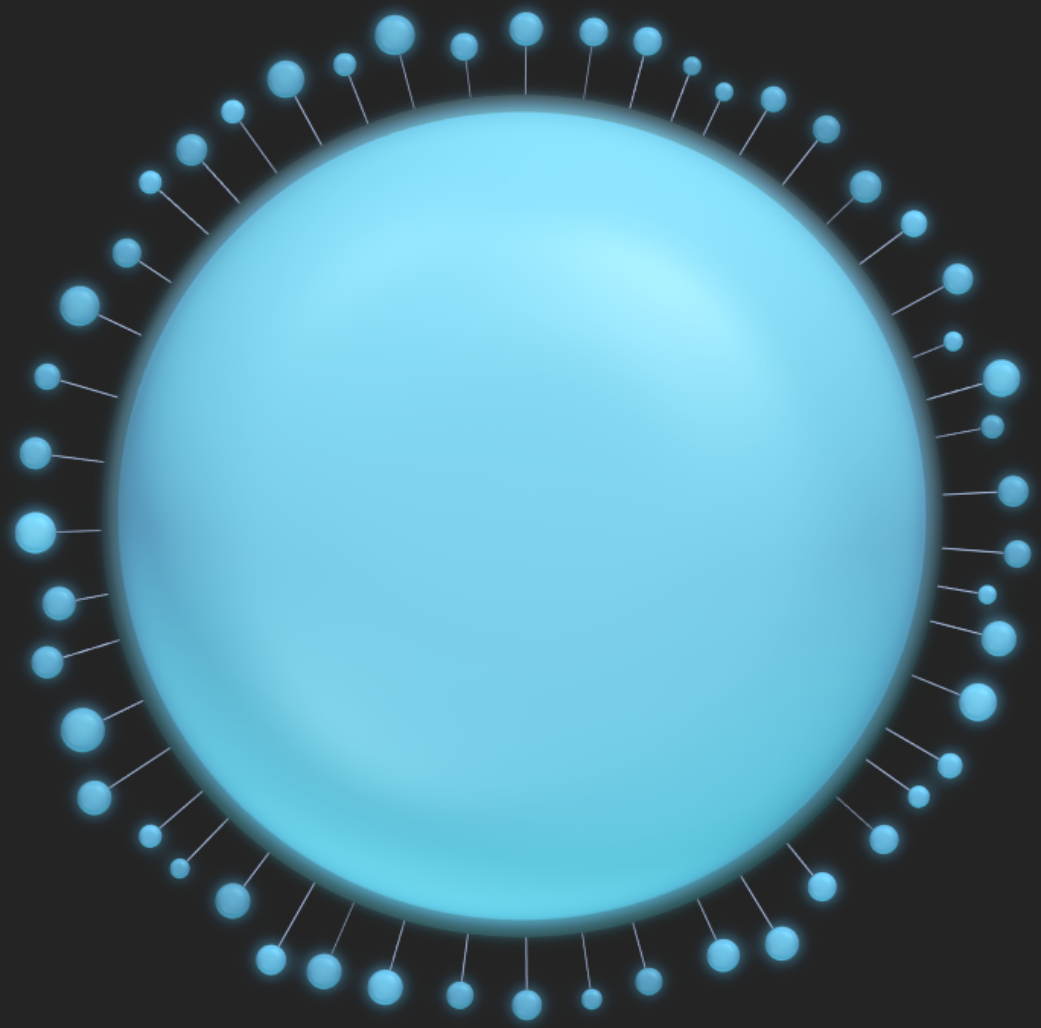
Loss of Agency

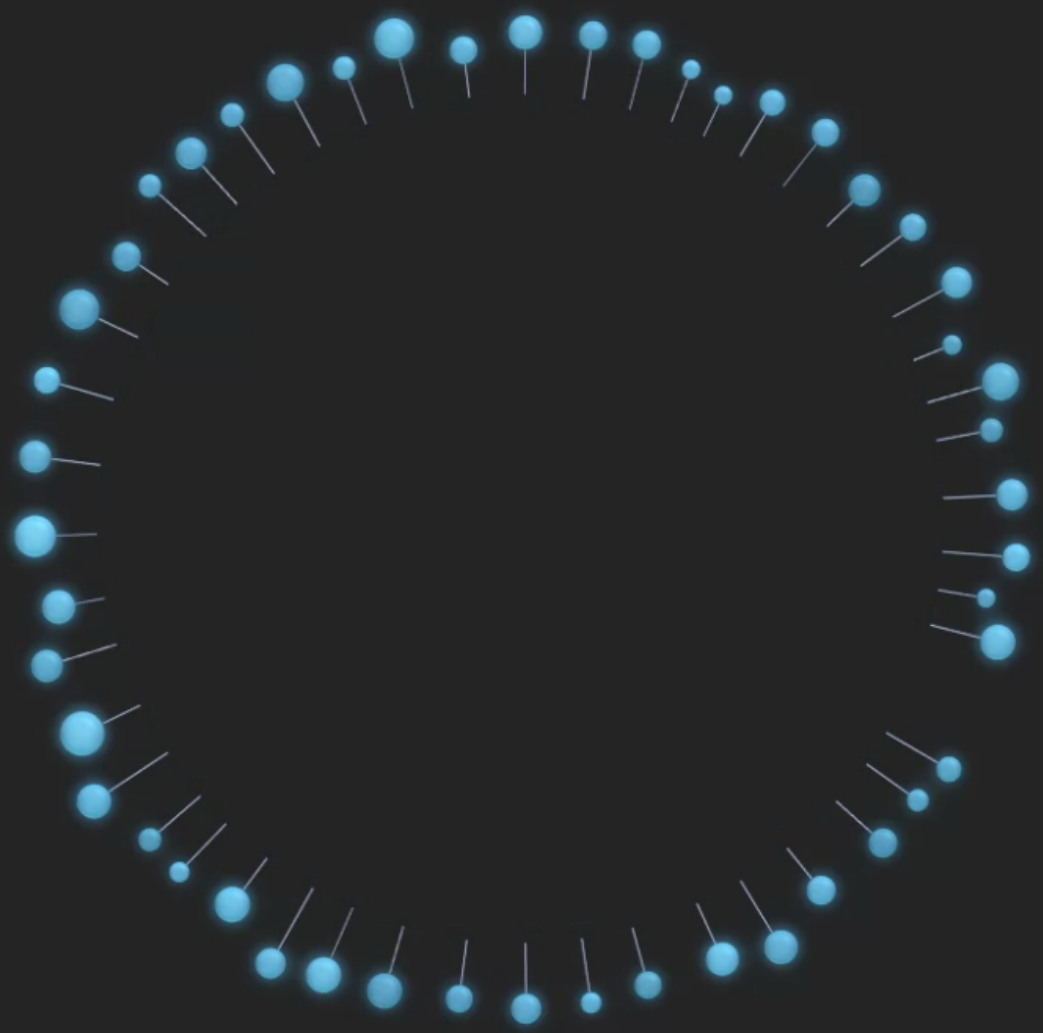
Loss of Community

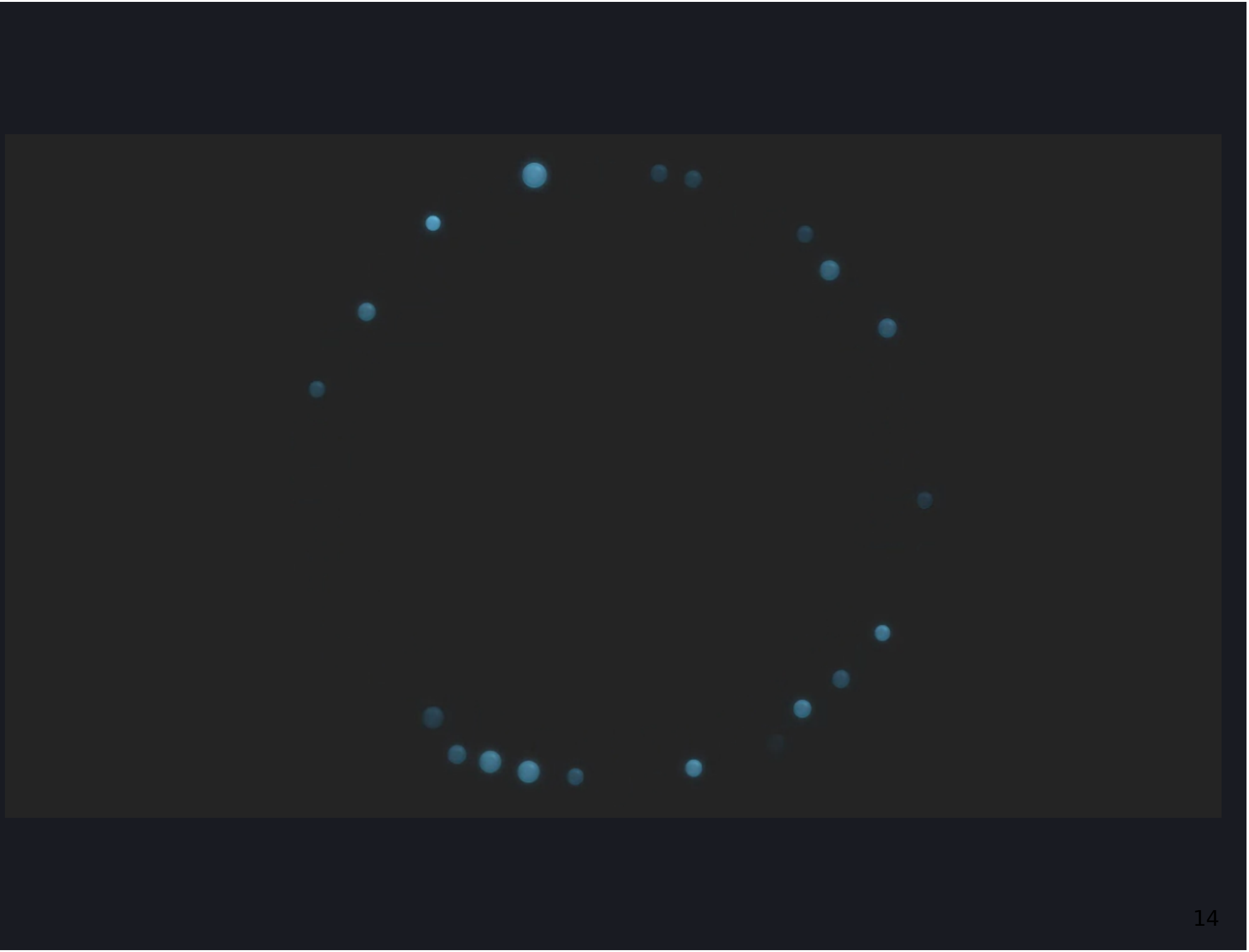
Anti-Participatory Structures

are

Anti-Community Structures







Context Collapse

causes social harm

Alice's Communities

High school math teacher

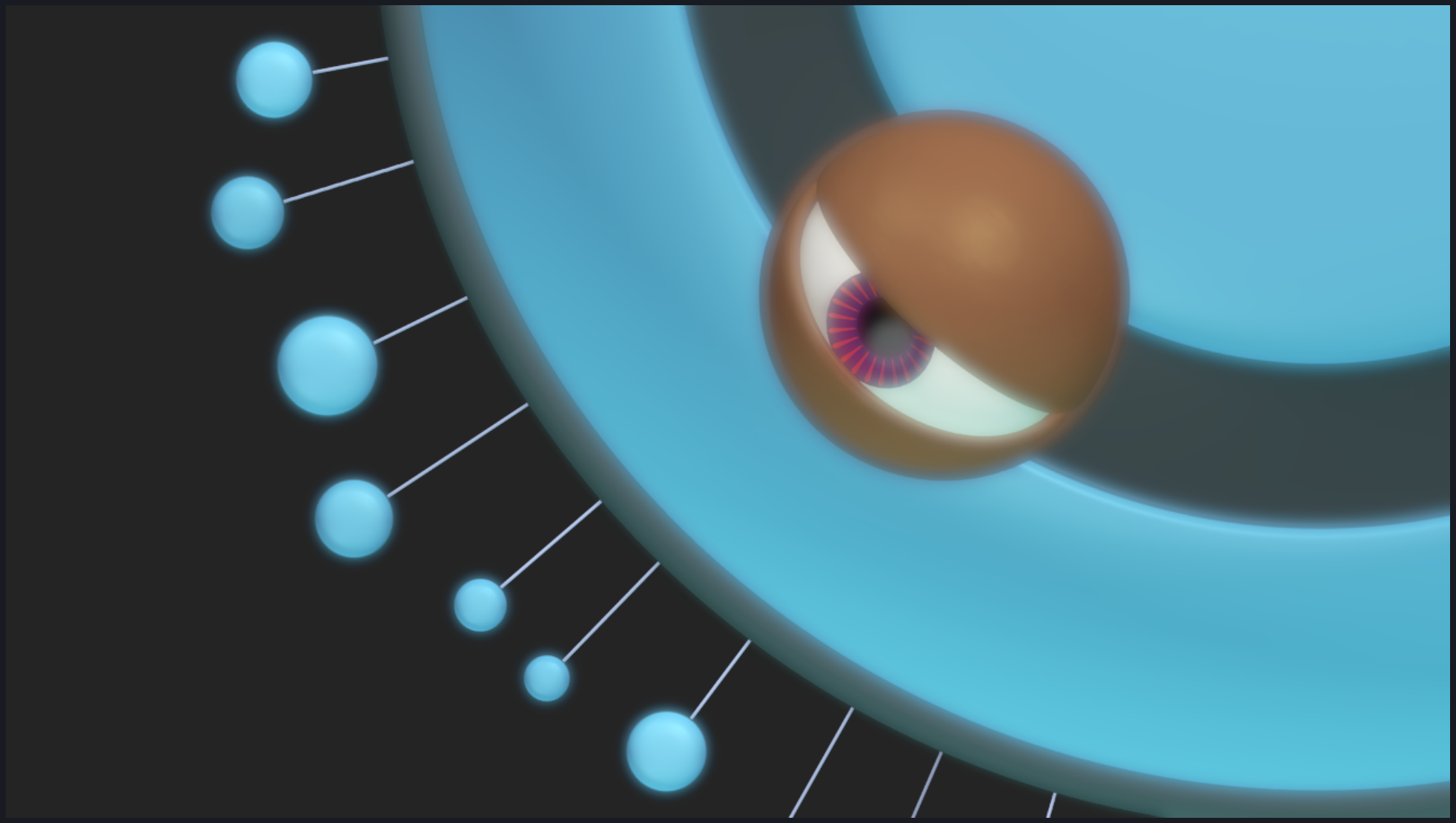
Tabletop games with friends

Fanfiction author

Context Collapse vs Communities

Surveillance Capitalism

causes social harm



Ad-Driven Engagement

causes social harm

The economics of ad-driven engagement

- Remove as much friction as possible!
- Monetize attention!
- Monetize controversy!
- Monetize conflict!

The economics of ad-driven engagement

Bad behavior: not just zero cost...

It's profitable!

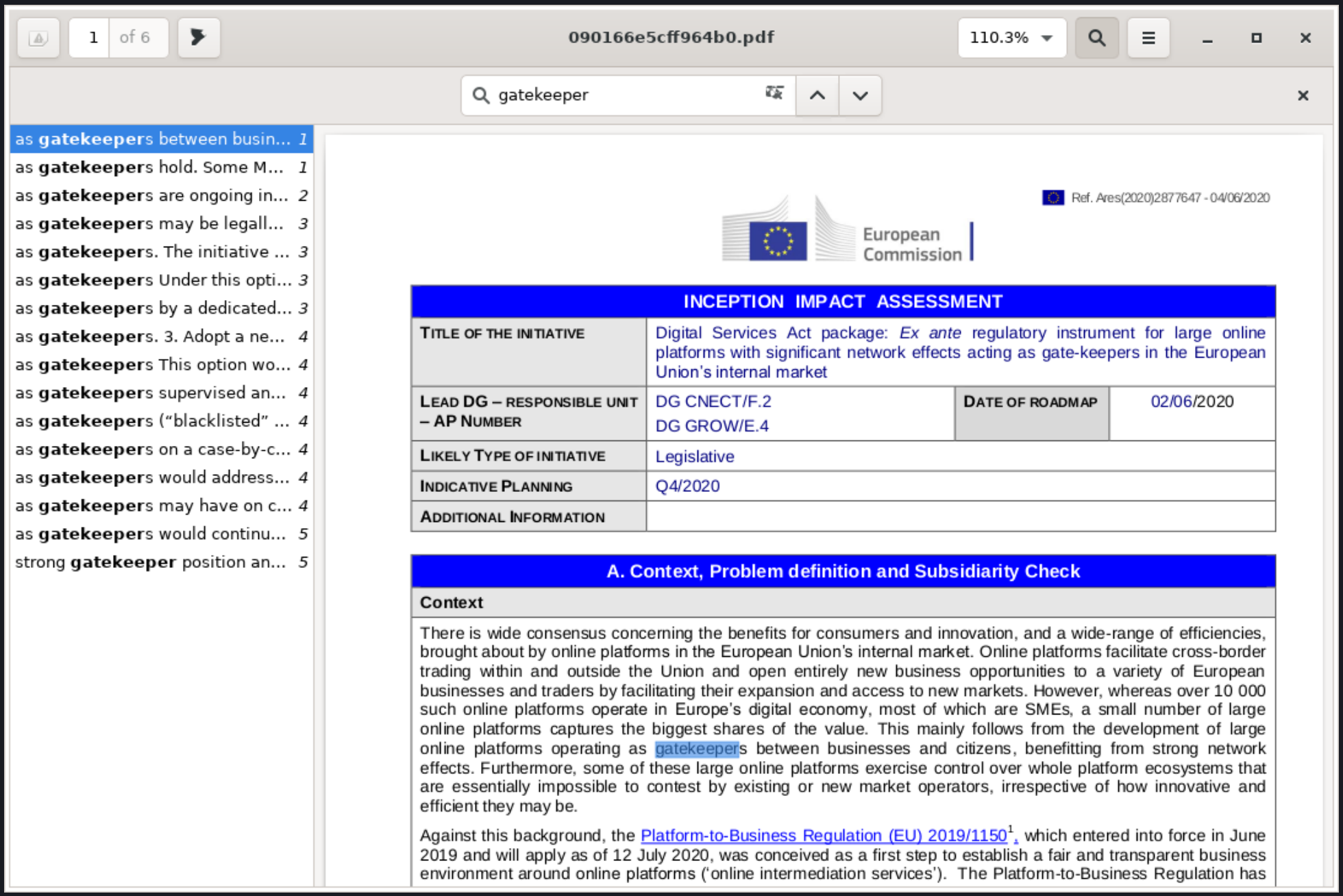
I know, we'll solve this with reputation systems!

Gameable credit reports

for every aspect of your life!

Gatekeepers

cause social harm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gatekeeper
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as gatekeepers ("blacklisted" ... 4
as gatekeepers on a case-by-c... 4
as gatekeepers would address... 4
as gatekeepers may have on c... 4
as gatekeepers would continu... 5
strong gatekeeper position an... 5
Ref. Ares(2020)2877647 - 04/06/2020
European Commission
INCEPTION IMPACT ASSESSMENT
TITLE OF THE INITIATIVE
Digital Services Act package: Ex ante regulatory instrument for large online platforms with significant network effects acting as gate-keepers in the European Union's internal market
LEAD DG – RESPONSIBLE UNIT – AP NUMBER
DG CNECT/F.2
DG GROW/E.4
DATE OF ROADMAP
02/06/2020
LIKELY TYPE OF INITIATIVE
Legislative
INDICATIVE PLANNING
Q4/2020
ADDITIONAL INFORMATION
A. Context, Problem definition and Subsidiarity Check
Context
There is wide consensus concerning the benefits for consumers and innovation, and a wide-range of efficiencies, brought about by online platforms in the European Union's internal market. Online platforms facilitate cross-border trading within and outside the Union and open entirely new business opportunities to a variety of European businesses and traders by facilitating their expansion and access to new markets. However, whereas over 10 000 such online platforms operate in Europe's digital economy, most of which are SMEs, a small number of large online platforms captures the biggest shares of the value. This mainly follows from the development of large online platforms operating as gatekeepers between businesses and citizens, benefitting from strong network effects. Furthermore, some of these large online platforms exercise control over whole platform ecosystems that are essentially impossible to contest by existing or new market operators, irrespective of how innovative and efficient they may be.
Against this background, the Platform-to-Business Regulation (EU) 2019/1150[1], which entered into force in June 2019 and will apply as of 12 July 2020, was conceived as a first step to establish a fair and transparent business environment around online platforms ('online intermediation services'). The Platform-to-Business Regulation has

How do we fix it?

"Top-Down" or "Bottom-Up"?


RISK
Opdrachten
RISK
Territoria

INFECTION RA
CHENNAI
BANGKOK
SHANGHAI
HONG KONG
JAKARTA
HO CHI MINH CITY
TAIPEI
OSAKA

Hugs as Emergent Behavior

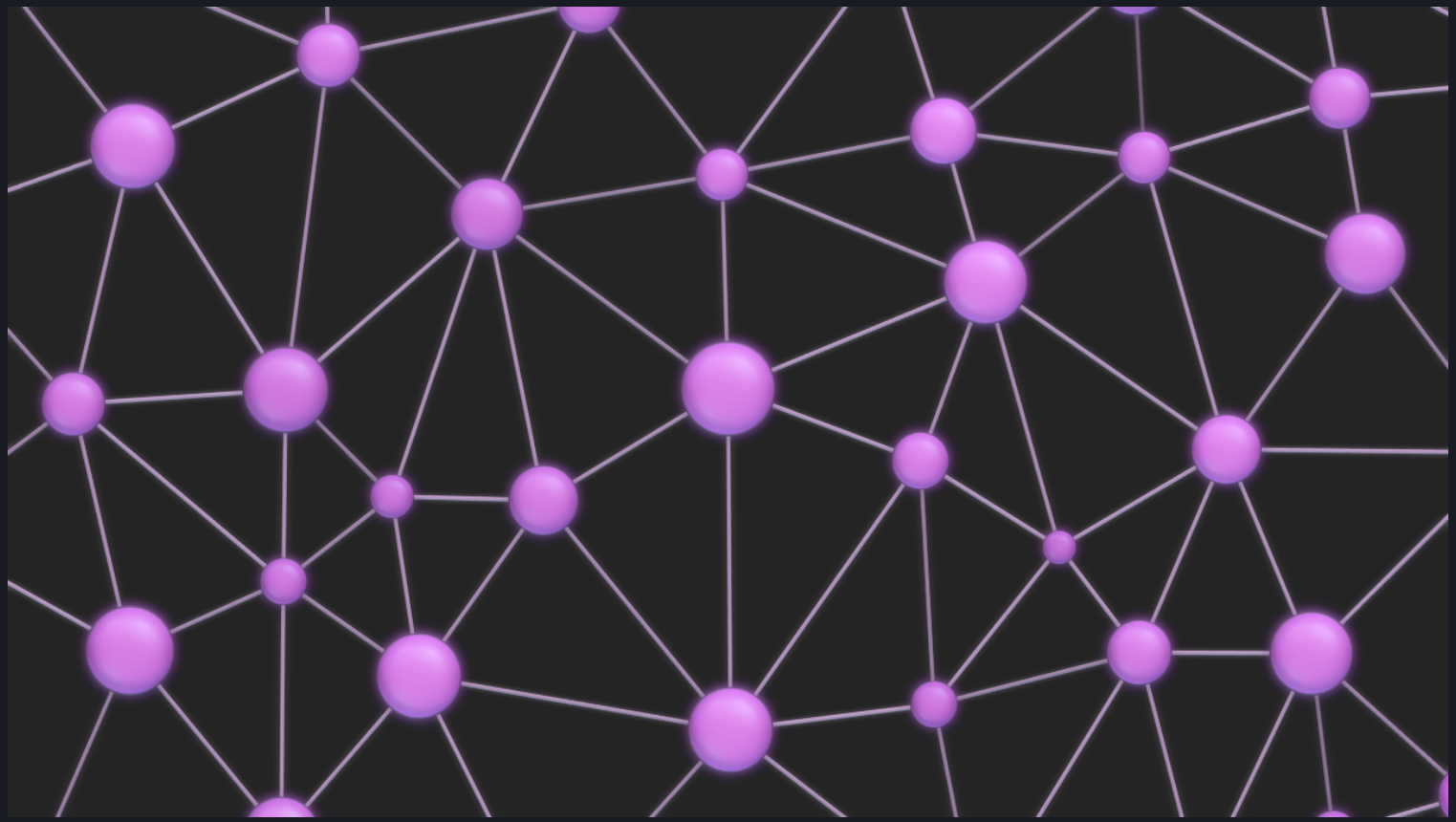
vs

Mandatory Hugs

You can't solve centralization

with more centralization

But we have a solution...



... and we're going to get the internet back

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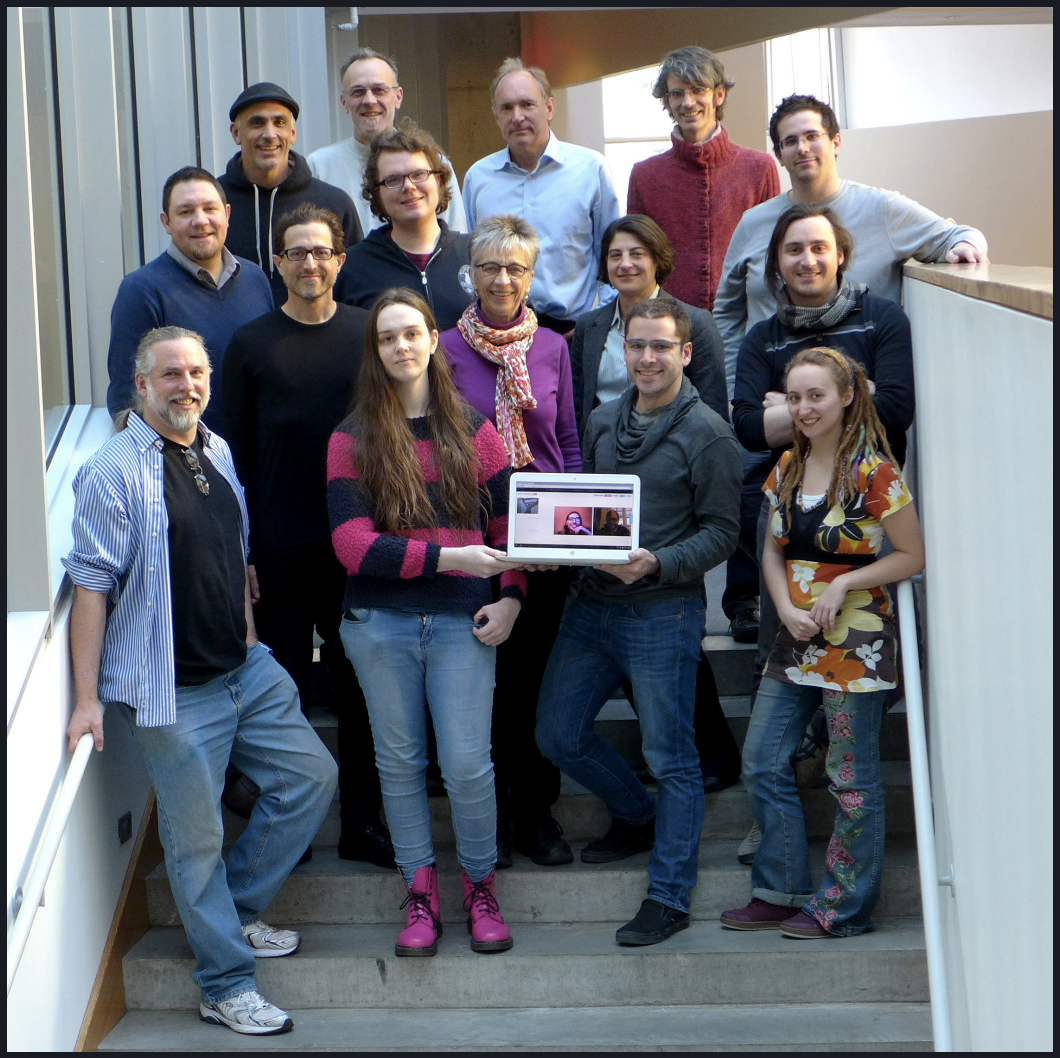
ActivityPub

Healing a fractured federation

- OStatus
- Zot
- XMPP
- Pump
- Tent
- Diaspora

About 3 years of standardization efforts...



ActivityPub

W3C Recommendation 23 January 2018

This version:

https://www.w3.org/TR/2018/REC-activitypub-20180123/

Latest published version:

https://www.w3.org/TR/activitypub/

Latest editor's draft:

https://w3c.github.io/activitypub/

Test suite:

https://test.activitypub.rocks/

Implementation report:

https://activitypub.rocks/implementation-report

Previous version:

https://www.w3.org/TR/2017/PR-activitypub-20171205/

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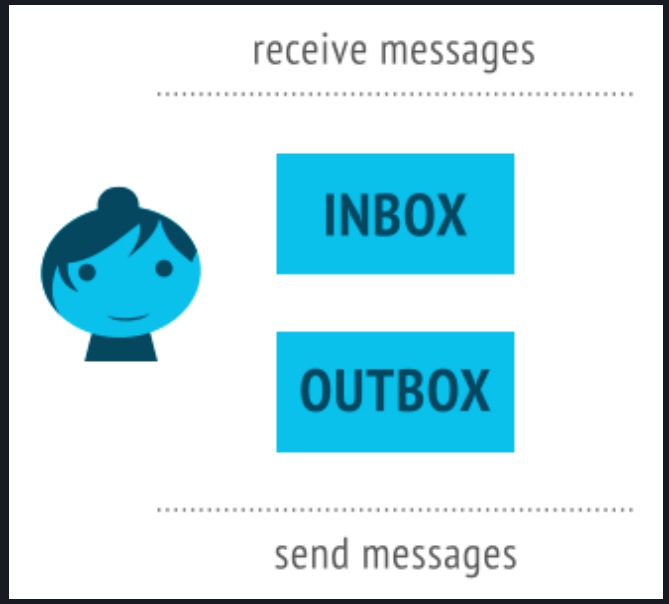
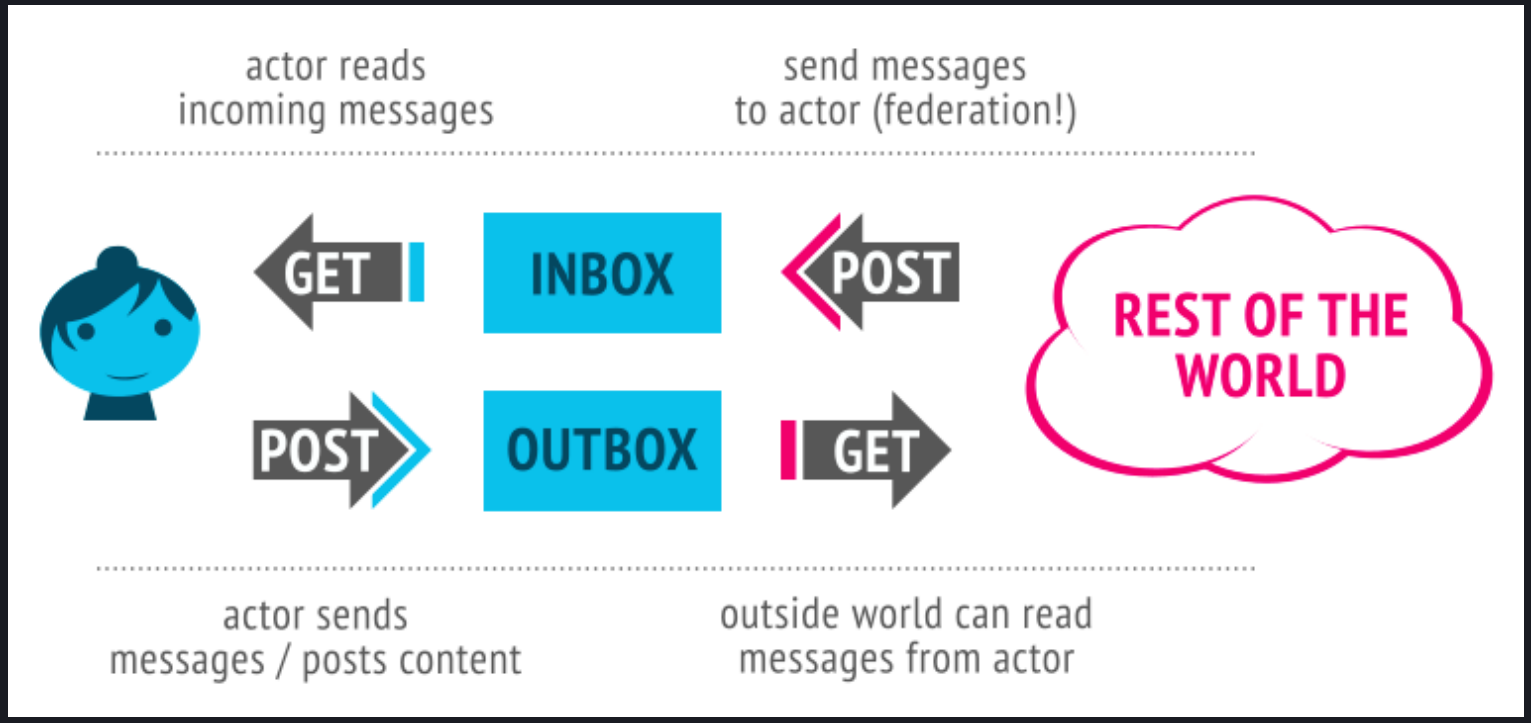
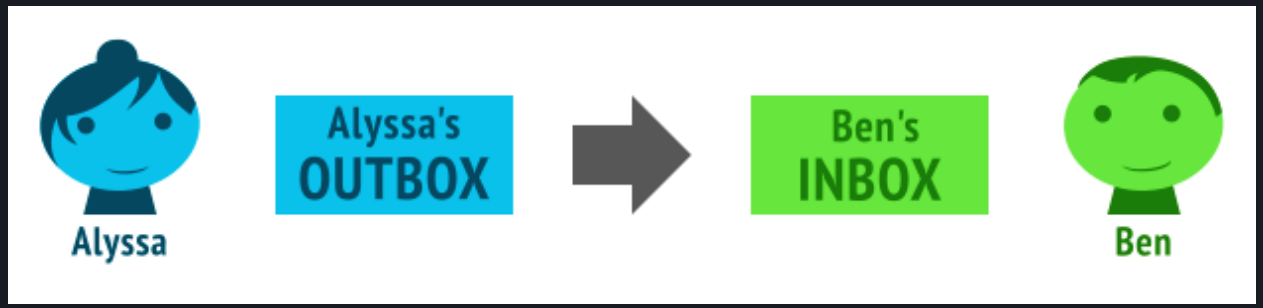
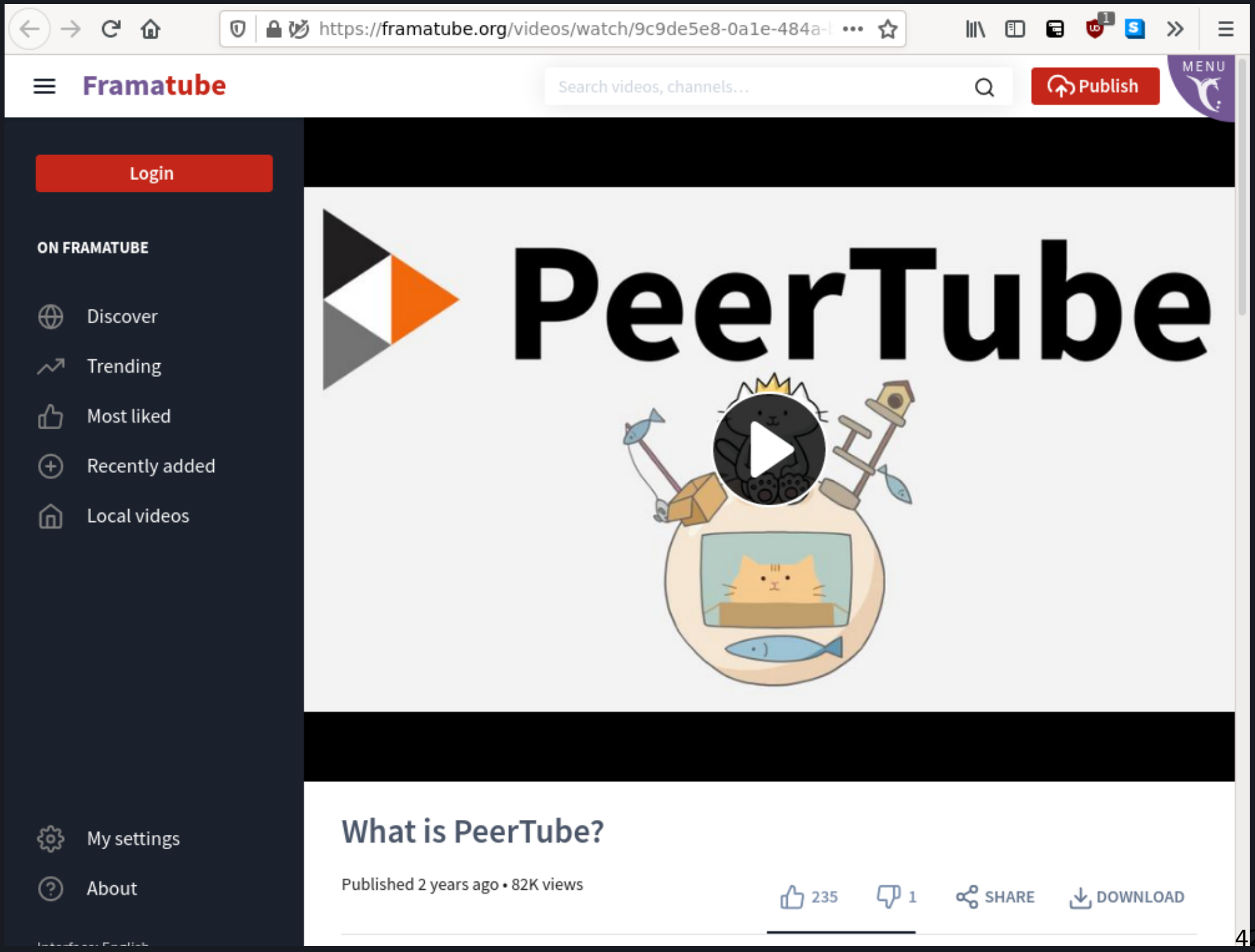

receive messages
INBOX
OUTBOX
send messages


actor reads
incoming messages
send messages
to actor (federation!)
GET
INBOX
POST
REST OF THE
WORLD
POST
OUTBOX
GET
actor sends
messages / posts content
outside world can read
messages from actor


Alyssa's
SERVER
POST
Ben's
INBOX
Ben


Alyssa
Alyssa's
OUTBOX
Ben's
INBOX
Ben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Search videos, channels...
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MENU
Login
ON FRAMATUBE
Discover
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Most liked
Recently added
Local videos
My settings
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PeerTube
What is PeerTube?
Published 2 years ago • 82K views
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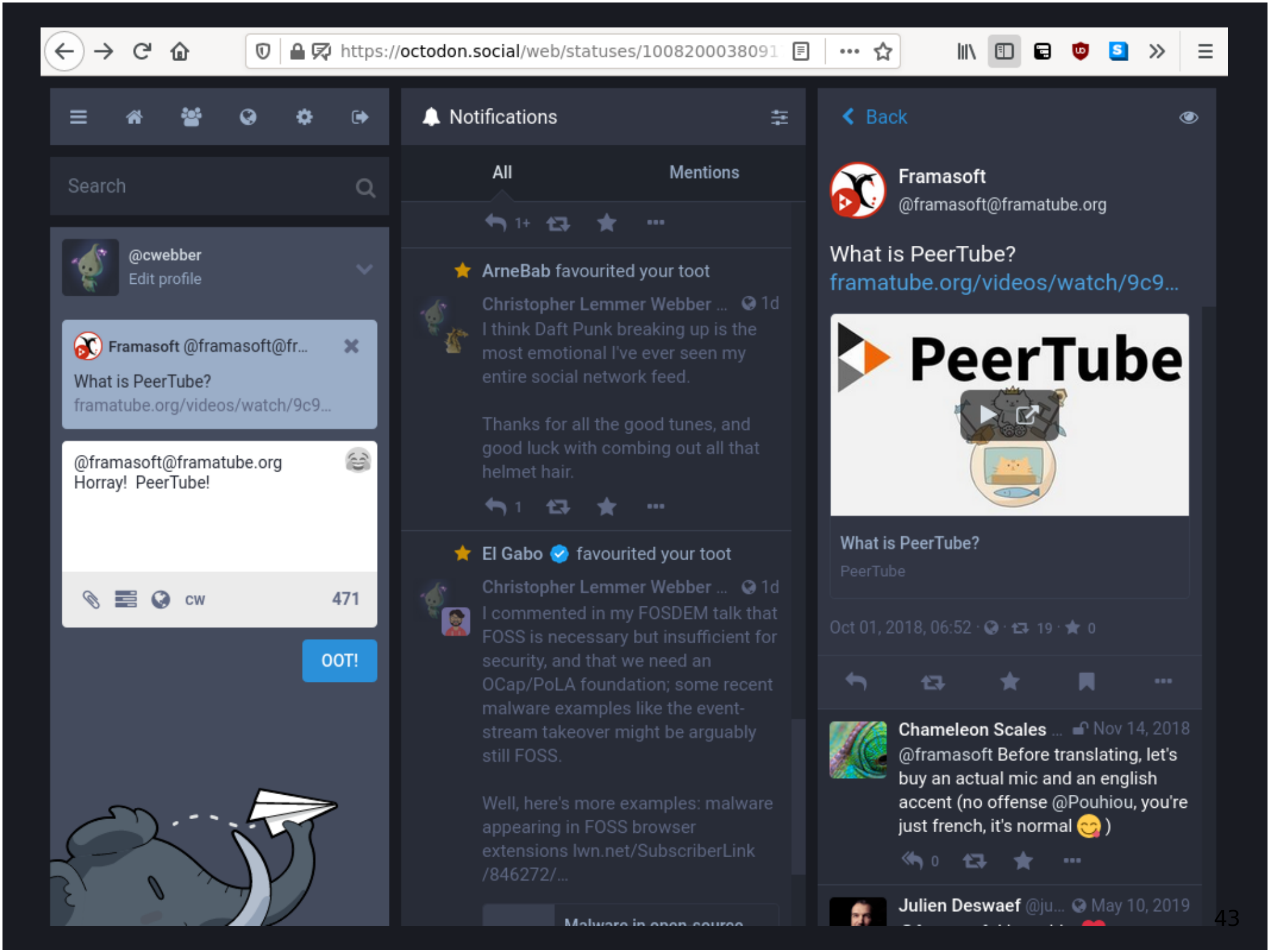
SHARE
DOWNLOAD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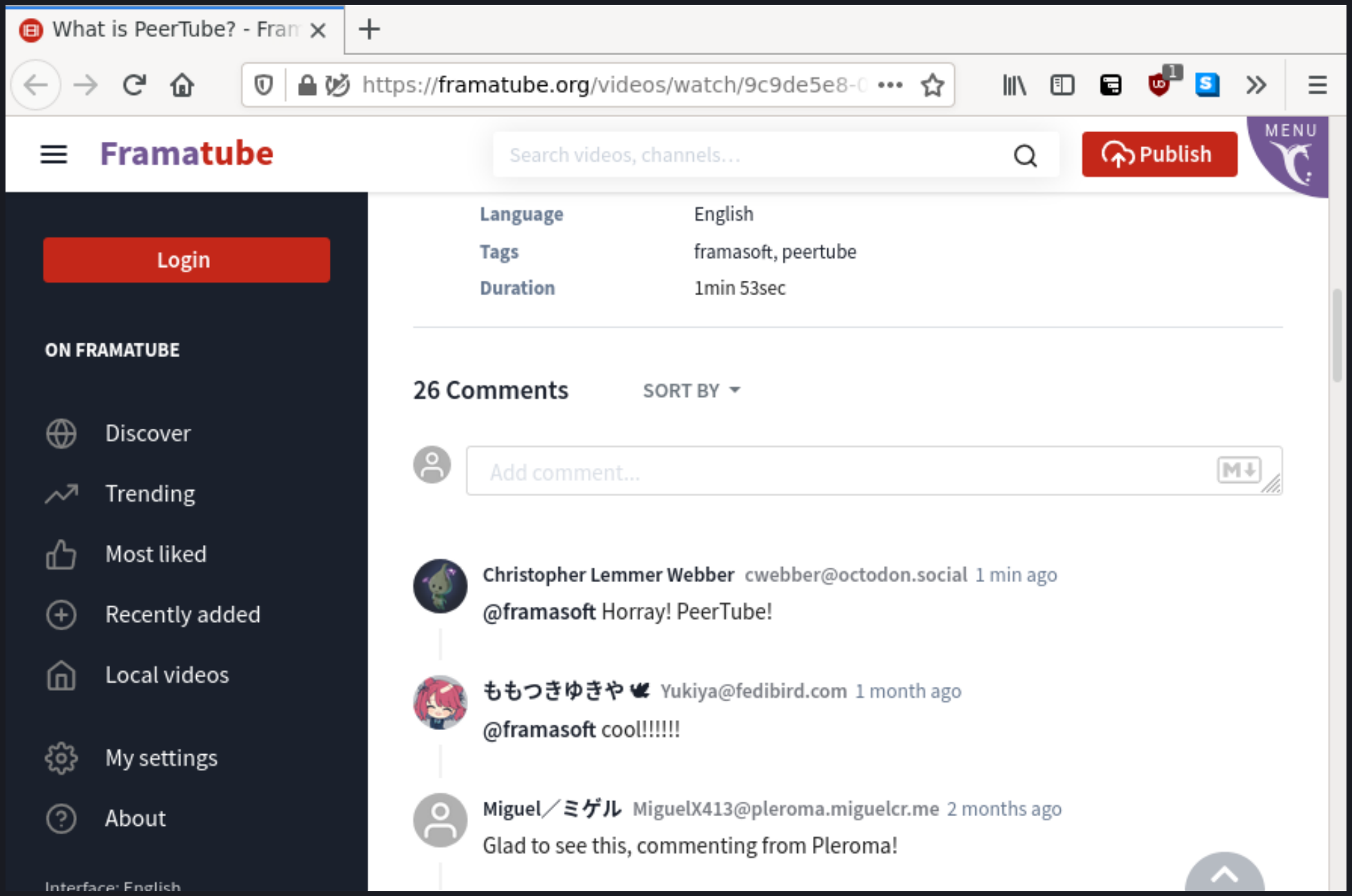
Search
@cwebber
Edit profile
Framasoft @framasoft@fr...
What is PeerTube?
framatube.org/videos/watch/9c9...
@framasoft@framatube.org
Horray! PeerTube!
cw
471
OOT!
Notifications
All
Mentions
1+
ArneBab favourited your toot
Christopher Lemmer Webber ... 1d
I think Daft Punk breaking up is the most emotional I've ever seen my entire social network feed.
Thanks for all the good tunes, and good luck with combing out all that helmet hair.
1
El Gabo favourited your toot
Christopher Lemmer Webber ... 1d
I commented in my FOSDEM talk that FOSS is necessary but insufficient for security, and that we need an OCap/PoLA foundation; some recent malware examples like the event-stream takeover might be arguably still FOSS.
Well, here's more examples: malware appearing in FOSS browser extensions lwn.net/SubscriberLink/846272/...
Back
Framasoft
@framasoft@framatube.org
What is PeerTube?
framatube.org/videos/watch/9c9...
PeerTube
What is PeerTube?
PeerTube
Oct 01, 2018, 06:52 · 19 · 0
Chameleon Scales ... Nov 14, 2018
@framasoft Before translating, let's buy an actual mic and an english accent (no offense @Pouhiou, you're just french, it's normal)
0
Julien Deswaef @ju... May 10, 2019


What is PeerTube? - Fran
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Framatube
Search videos, channels...
Publish
MENU
Login
ON FRAMATUBE
Discover
Trending
Most liked
Recently added
Local videos
My settings
About
Interface: English
Language English
Tags framasoft, peertube
Duration 1min 53sec
26 Comments
SORT BY
Add comment...
Christopher Lemmer Webber cwebber@octodon.social 1 min ago
@framasoft Horray! PeerTube!
ももつきゆきや Yukiya@fedibird.com 1 month ago
@framasoft cool!!!!!!
Miguel／ミゲル MiguelX413@pleroma.miguelcr.me 2 months ago
Glad to see this, commenting from Pleroma!

See "Overview" section of

of the ActivityPub spec

Widely implemented...

- Mastodon
- Pleroma
- Peertube
- Funkwhale
- Pixelfed
- Wordpress plugin
- ... too many to track anymore

Not bad, ActivityPub!

~50-100 implementations

Thousands of servers

Millions of users

On the Accomplishments of the Fediverse

How communities protect the needs of their members

Enormous community-driven success!

But there's more to do.

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Unmet needs in present AP ecosystem

- Content survival
- Identity survival and migration
- Better privacy and security (E2EE, P2P)
- Stronger anti-abuse / anti-harassment
- Richer interactions

ELECTRIC
COMMUNITIES

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LOS ALTOS, CA 94022
415.917.5640
ELECTRIC@COMMUNITIES.COM

Cyberspace Protocol Requirements

Version 27-February-1995

We begin with the overall system goals. We have identified eight high-level characteristics that the Global Cyberspace Infrastructure architecture must possess:

	Scalable	The technological and institutional components should be sufficient for a system that includes every person and computer in the world.
	Open	Cyberspace is open to new providers of services without regulation and at low cost.
	Decentralized	There exists no singular privileged technical or administrative nexus.
	Traversable	Data and objects can move between users, between services, and between machines.
$	Commercial	Cyberspace contains a complete foundation for economic activity of all kinds.
	Social	Cyberspace contains the components necessary to support community life.
	Secure	The technology facilitates making good decisions about which entities can be trusted and protects users from the untrusted ones.
	Portable	Protocols and service features are logically independent of the technical details of the physical network.

Object-Capability Security in Virtual Environments

Martin Scheffler Jan P. Springer Bernd Froehlich

Bauhaus-Universität Weimar

Abstract

Access control is an important aspect of shared virtual environments. Resource access may not only depend on prior authorization, but also on context of usage such as distance or position in the scene graph hierarchy. In virtual worlds that allow user-created content, participants must be able to define and exchange access rights to control the usage of their creations. Using object capabilities, fine-grained access control can be exerted on the object level. We describe our experiences in the application of the object-capability model for access control to object-manipulation tasks common to collaborative virtual environments. We also report on a prototype implementation of an object-capability safe virtual environment that allows anonymous, dynamic exchange of access rights between users, scene elements, and autonomous actors.

Keywords: Object Capabilities, Security, Virtual Environments

Index Terms: D.1.5 [Programming Techniques]: Object-Oriented Programming; I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism—Virtual Reality; K.6.5 [Computing Milieux]: Management of Computing and Information Systems—Security and Protection

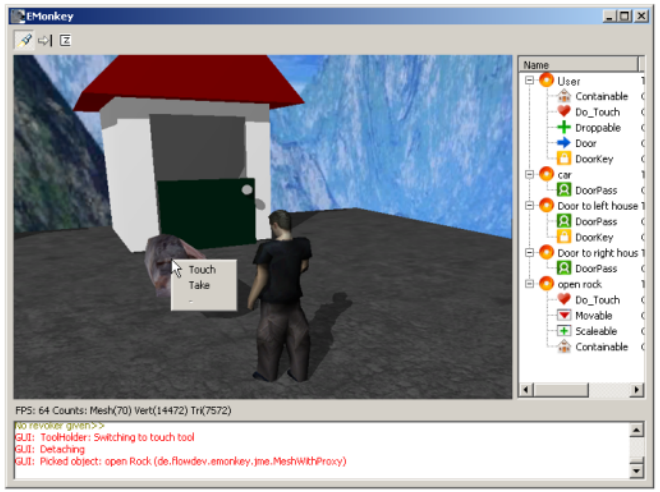

Figure 1: Screenshot of a prototype virtual environment using object-capability security.

1 Introduction

The rise of a new category of virtual environments could be observed in recent years: virtual worlds that allow thousands of users to interact and shape their surroundings. The premier example of this kind of virtual world is Second Life (http://www.secondlife.com). In Second Life, a number of tools can be used to add virtual objects to the world. Using a scripting language, users can program their objects to let them interact with other users or objects. It is possible that allow for dynamic assignment and revokation of fine-grained access rights in an anonymous way.

We created a prototype virtual environment using the capability-secure programming language E (cf. figure 1). In our system, capabilities define how actors can be accessed and manipulated (e. g. how they can be moved or how to change their appearance). Capabilities can be attached to the visual representation of their actors to make them publicly available and they can be exchanged

https://spritelyproject.org/

Spritely Golem: Secure, p2p distributable content for the fediverse

Prerequisite reading: (none)

Recommended reading: Magenc

This is a demo for Golem, one of the Spritely demos. Each Spritely demo tries to demonstrate a key idea on how to "level up" the fediverse.

The problems this demo is trying to address is:

- Nodes go down, and their content tends to go with them. How can we have content that survives? Content which is distributable over a peer to peer network seems like it would help.
- Except if an entire network is helping hold onto and distribute content, how do we keep private content private?
- How to do this in a way that is compatible with the ActivityPub specification?

By encrypting the file and splitting it into chunks distributed through the network and only sharing the decryption key with the intended recipient, and by using a URI scheme that captures the appropriate information, we can accomplish all the above. Golem uses the magenc extension of the magnet URI scheme to accomplish the above.

Why the name "Golem"? In folklore and fantasy literature (the name here can apply to either but borrows more from the fantasy literature tradition, but the idea originates in Jewish folklore), a Golem is assembled from inanimate parts, and only through the casting of magic words is it brought to life. Likewise, here encrypted chunks are distributed inanimately through the network, and the magic words uttered are the decryption key, known only to the intended recipients (and, well, anyone they choose to pass them on to).

NOTE: This demo is not intended for production deployments. The purpose of this demo is to explain its core ideas to federated social web implementors. As such, the demo takes many shortcuts for the sake of brevity. It is intended to be simple enough to

OcapPub: Towards networks of consent

This paper released under the Apache License version 2.0; see LICENSE.txt for details.

For a broader overview of various anti-spam techniques, see AP Unwanted Messages, which is in many ways informed this document but currently differs in some implementation rollout differs. (These two documents may converge.)

Conceptual overview

The federated social web is living in its second golden age, after the original success of StatusNet and OStatus in the late 2000s. A lot of this success has been around unification of adoption of a single protocol, ActivityPub, to connect together the many different instances and applications into a unified network.

Unfortunately from a security and social threat perspective, the way ActivityPub is currently rolled out is under-prepared to protect its users. In this paper we introduce OcapPub, which is compatible with the original ActivityPub specification. With only mild to mildly-moderate adjustments to the existing network, we can deliver what we call “networks of consent”: explicit and intentional connections between different users and entities on the network. The idea of “networks of consent” is then implemented on top of a security paradigm called “object capabilities”, which as we will see can be neatly mapped on top of the actor model, on which ActivityPub is based. While we do not claim that all considerations of consent can be modeled in this or any protocol, we believe that the maximum of consent that is *possible* to encode in such a system can be encoded.

Intentional, Granted, Accountable, Revokeable

OcapPub: Towards networks of consent

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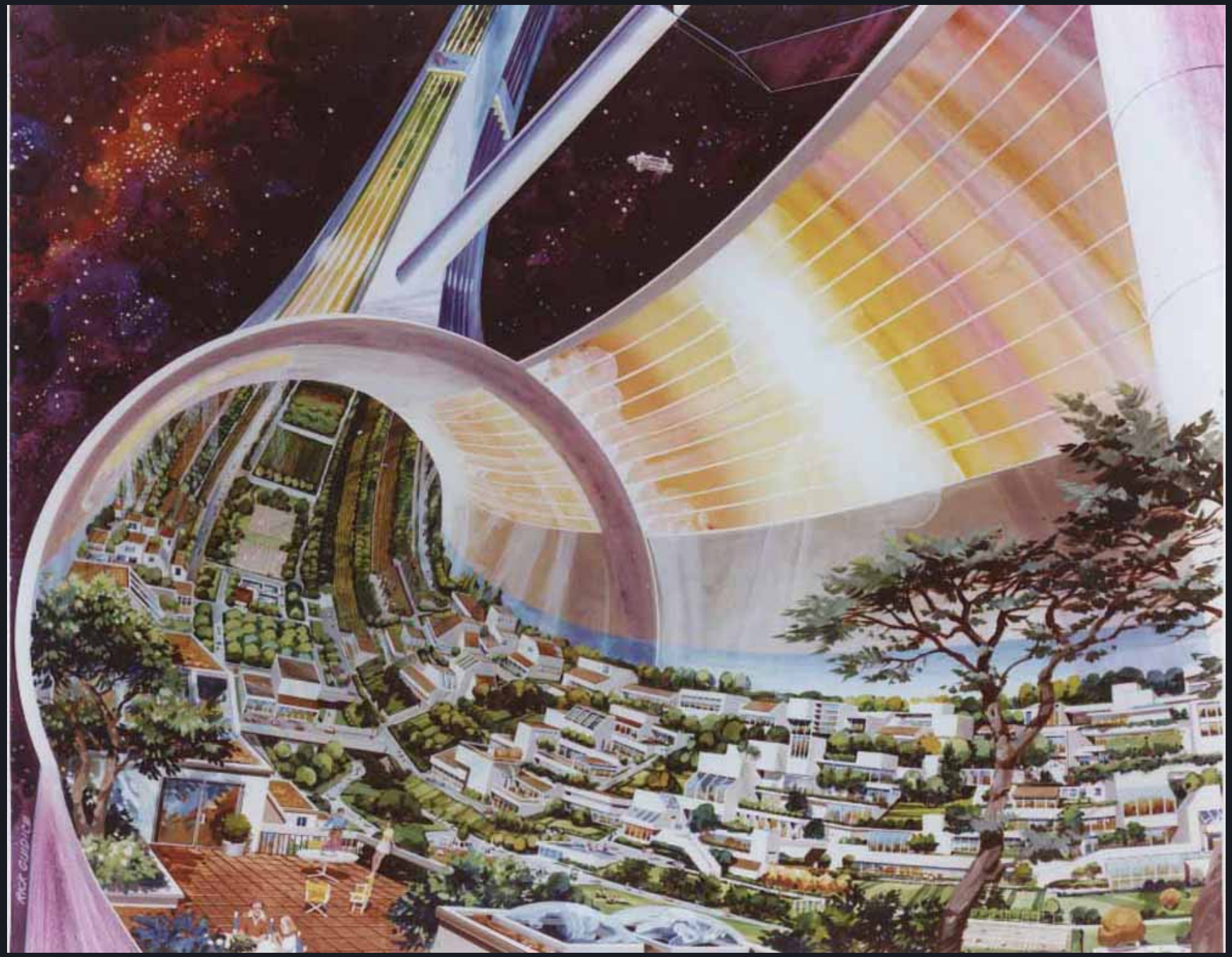
The complement to freedom of speech

is the freedom to filter



https://en.wikipedia.org/wiki/NASA_spinoff_technologies

Contents [hide]

Build the present,

build the future.

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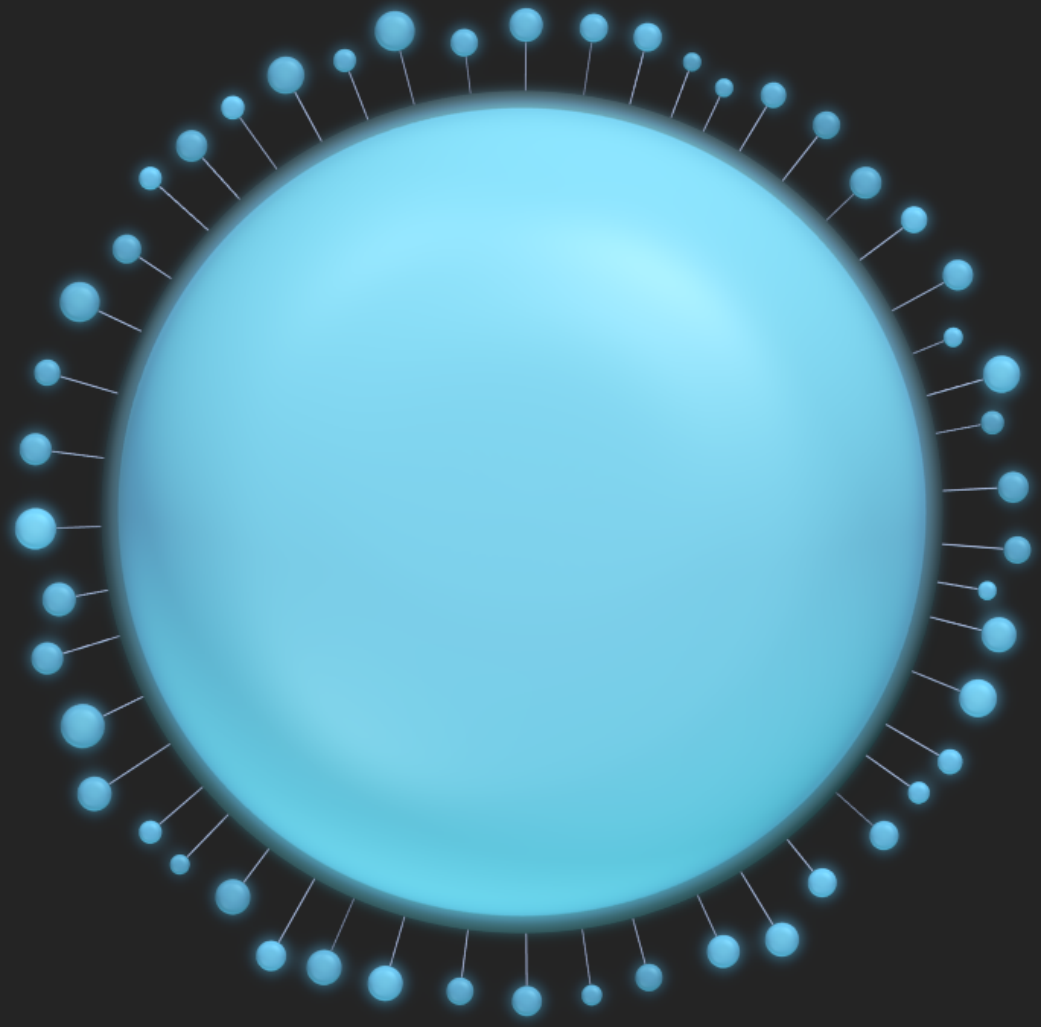
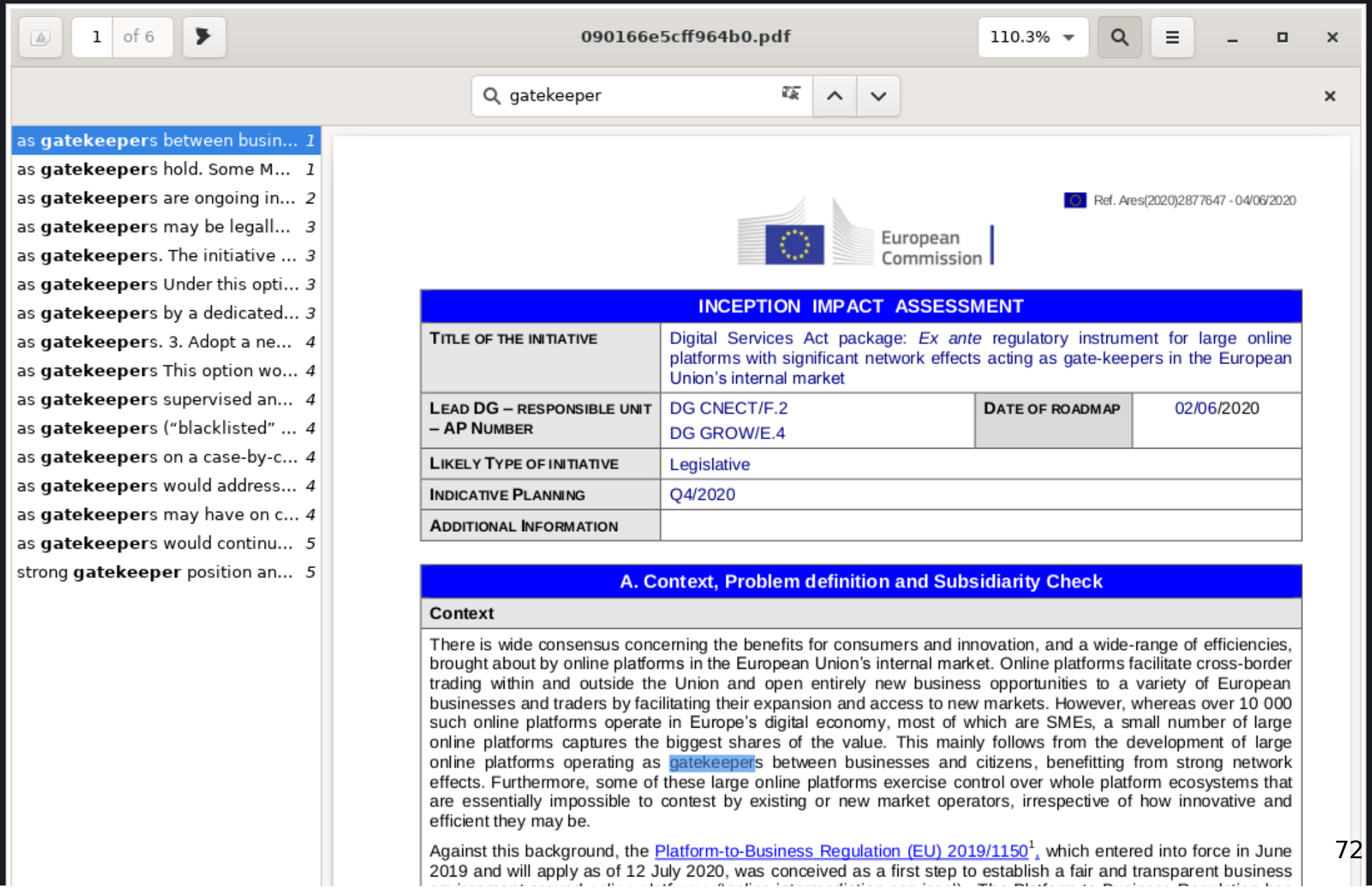
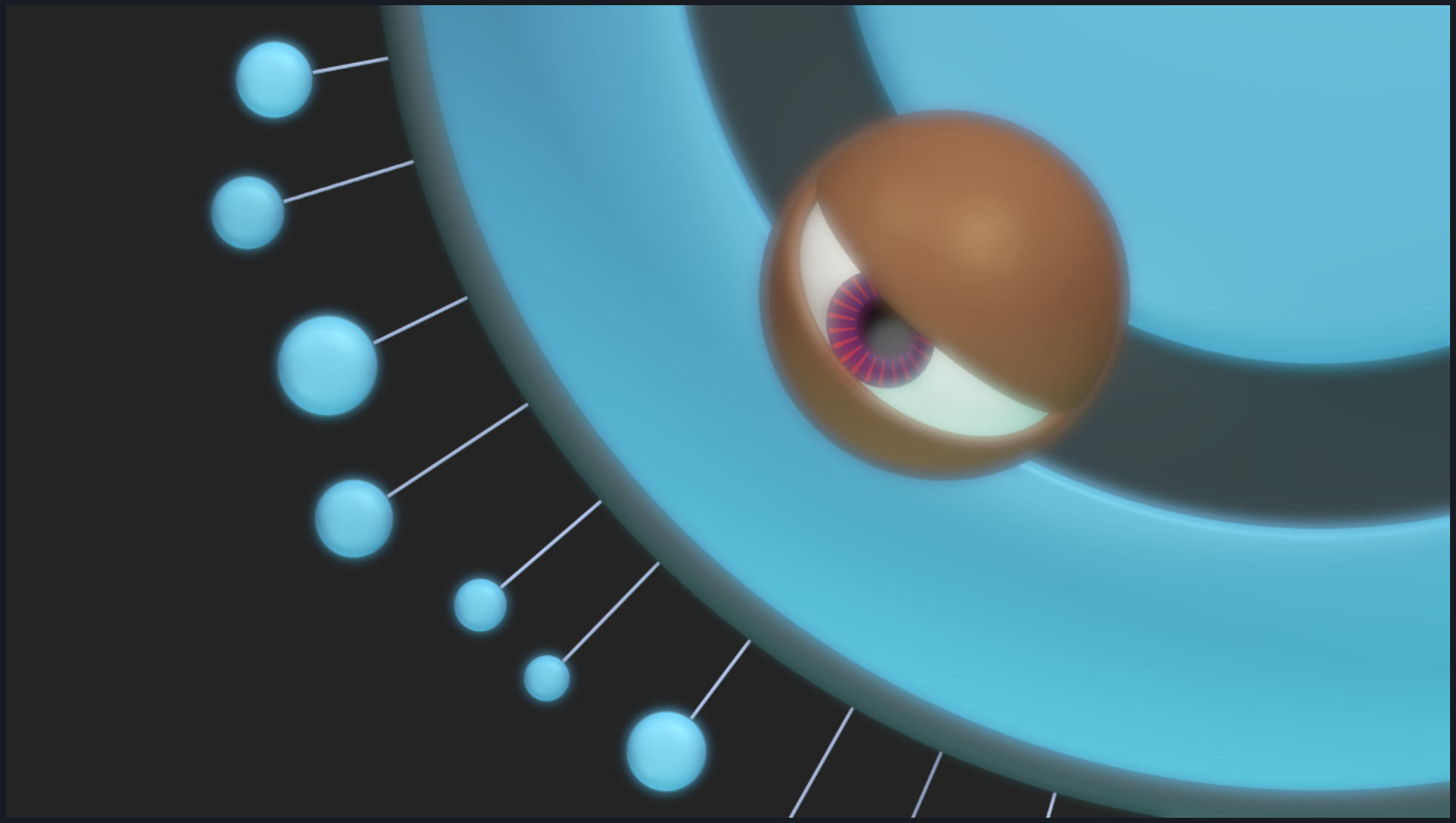
A centralized social pandemic

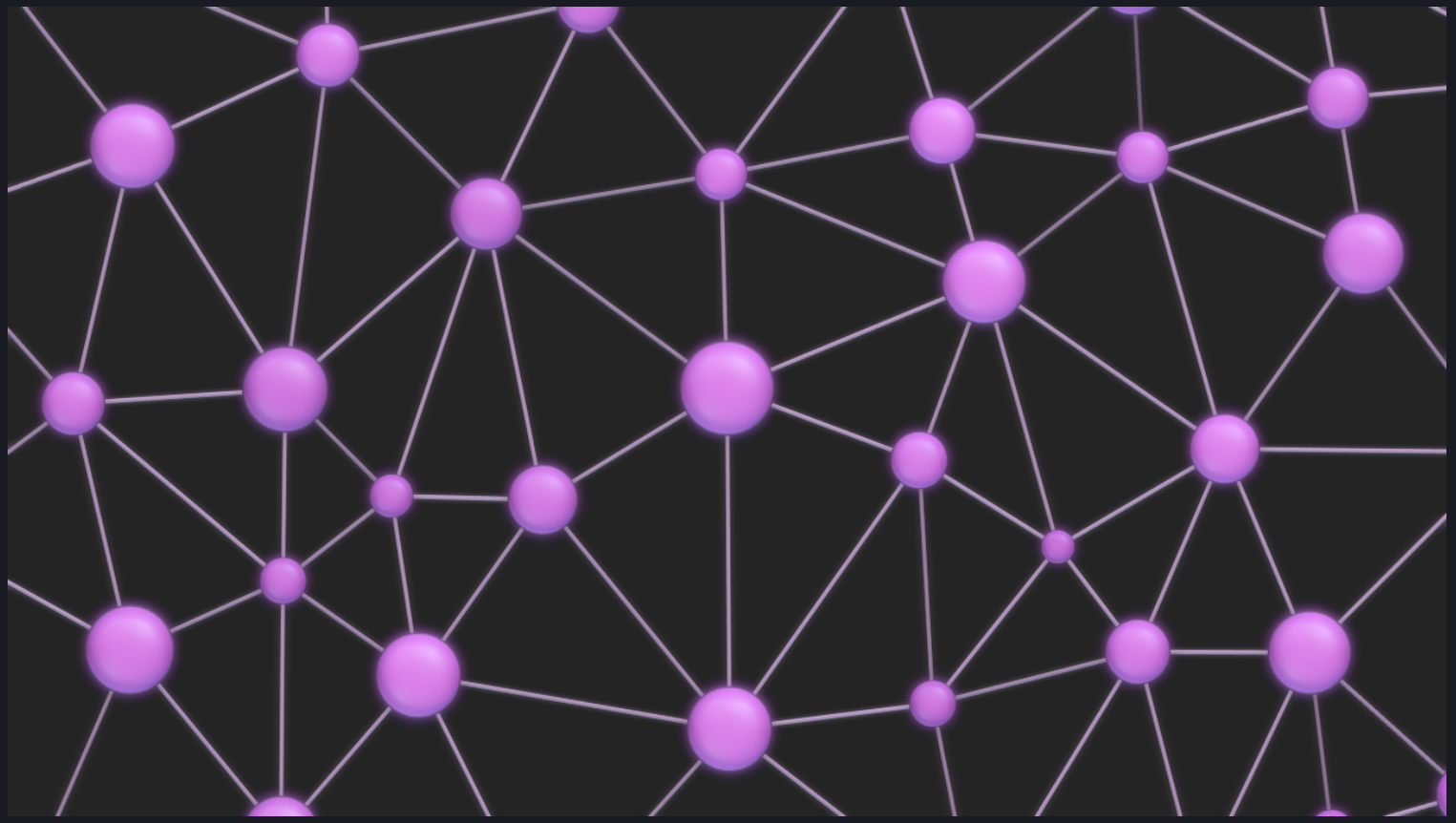


The immune response





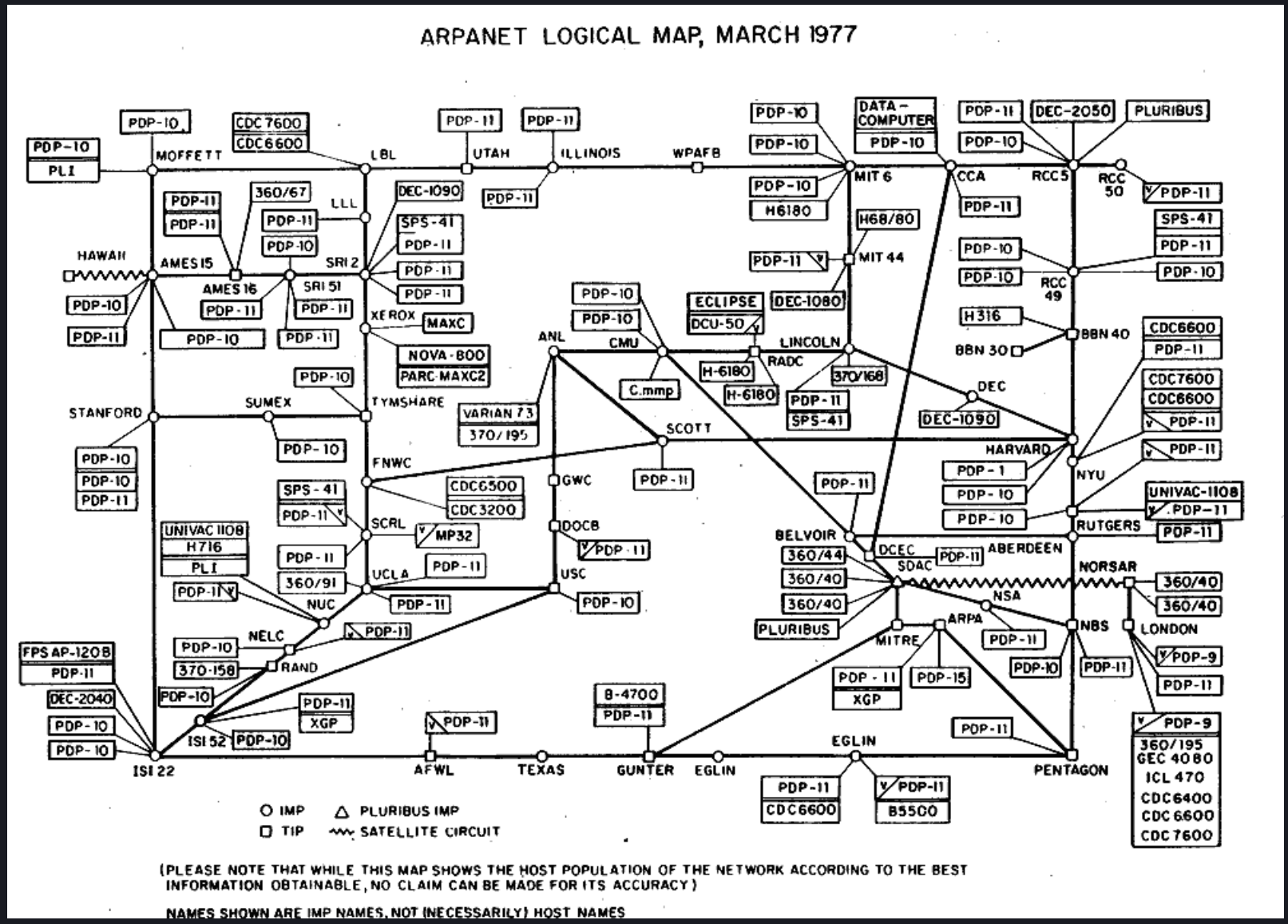
We have a non-gatekeeper alternative...



...but we need support.

Networked community technology

is essential infrastructure


ARPANET LOGICAL MAP, MARCH 1977
PDP-10
PDP-10
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CDC6600
LBL
PDP-11
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PDP-10
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DATA-COMPUTER
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SPS-41
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H68/80
PDP-11
MIT 44
SPS-41
PDP-11
PDP-10
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HAWAII
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DCU-50
DEC-1080
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DEC-1090
CDC7600
CDC6600
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SUMEX
STANFORD
VARIAN 73
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PLI
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PLURIBUS
DCEC
PDP-11
SDAC
ABERDEEN
NORSAR
360/40
360/40
PDP-11
PDP-10
PDP-10
NUC
PDP-11
NSA
ARPA
PDP-11
NBS
LONDON
PDP-9
PDP-11
NELC
PDP-11
MITRE
PDP-15
PDP-11
XGP
PDP-10
PDP-11
FPSAP-120B
PDP-11
370-158
RAND
DEC-2040
PDP-10
PDP-10
PDP-10
PDP-11
XGP
ISI52
PDP-10
ISI 22
PDP-11
AFWL
TEXAS
8-4700
PDP-11
GUNTER
EGLIN
EGLIN
PDP-11
CDC6600
PDP-11
B5500
PENTAGON
PDP-9
360/195
GEC 4080
ICL 470
CDC6400
CDC 6600
CDC 7600
IMP
TIP
PLURIBUS IMP
SATELLITE CIRCUIT
(PLEASE NOTE THAT WHILE THIS MAP SHOWS THE HOST POPULATION OF THE NETWORK ACCORDING TO THE BEST INFORMATION OBTAINABLE, NO CLAIM CAN BE MADE FOR ITS ACCURACY)
NAMES SHOWN ARE IMP NAMES, NOT (NECESSARILY) HOST NAMES

We have the alternative to gatekeepers.

We can do better than the status quo.

Avoid entrenching social monopolists

Demand open, interoperable protcocols (but be flexible)

Fund community-oriented alternatives

Participate!

The information superhighway isn't done.

Networked communities are our future.

Let's work together!