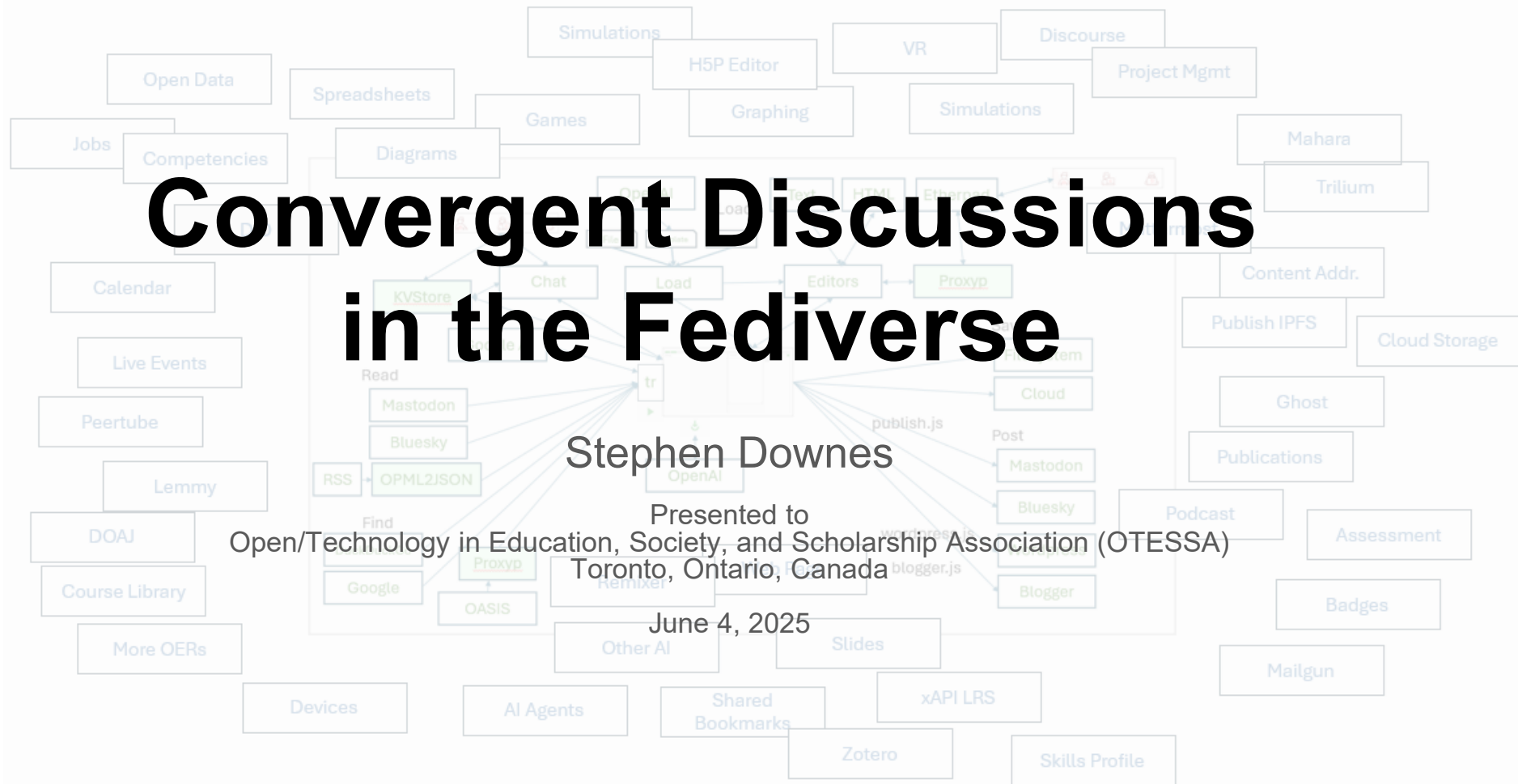# Convergent Discussions in the Fediverse

Stephen Downes

Presented to
Open/Technology in Education, Society, and Scholarship Association (OTESSA)
Toronto, Ontario, Canada

June 4, 2025

Start With The Demo

https://ple.mooc.ca/

Promises I Made in the Abstract

- Description of the fediverse and introduction to major fediverse services such as Mastodon, Bluesky, Peertube, etc.
- Discussion of the dynamics on online discussion including especially the characteristics of 'divergent', 'linear' and convergent discussions
- Demonstration of convergent fediverse discussion software
- Interactive practice using the software among participants to conduct an online convergent discussion
- Consideration of learning potential for convergent discussions in the fediverse

Platforms

Why platform social media is so awful

Wikipedia: "Criticisms include the outsize influence Facebook has on the lives and health of its users and employees, as well as Facebook's influence on the way media, specifically news, is reported and distributed."

https://en.wikipedia.org/wiki/Criticism_of_Facebook
https://en.wikipedia.org/wiki/Criticism_of_Twitter
https://en.wikipedia.org/wiki/LinkedIn#Criticism_and_controversies
Trends image: Anatoliy Gruzd, OTESSA 2025, photo by author
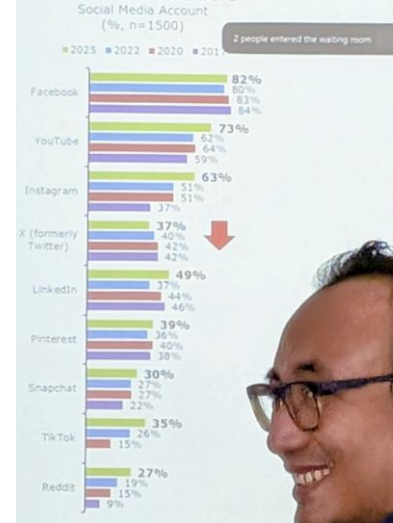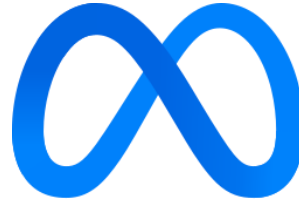
The Fediverse

A *federation* of social network services based on common protocols and distributed governance

Some applications include:
- Mastodon
- Bluesky
- Lemmy
- Peertube
- Pixlfed
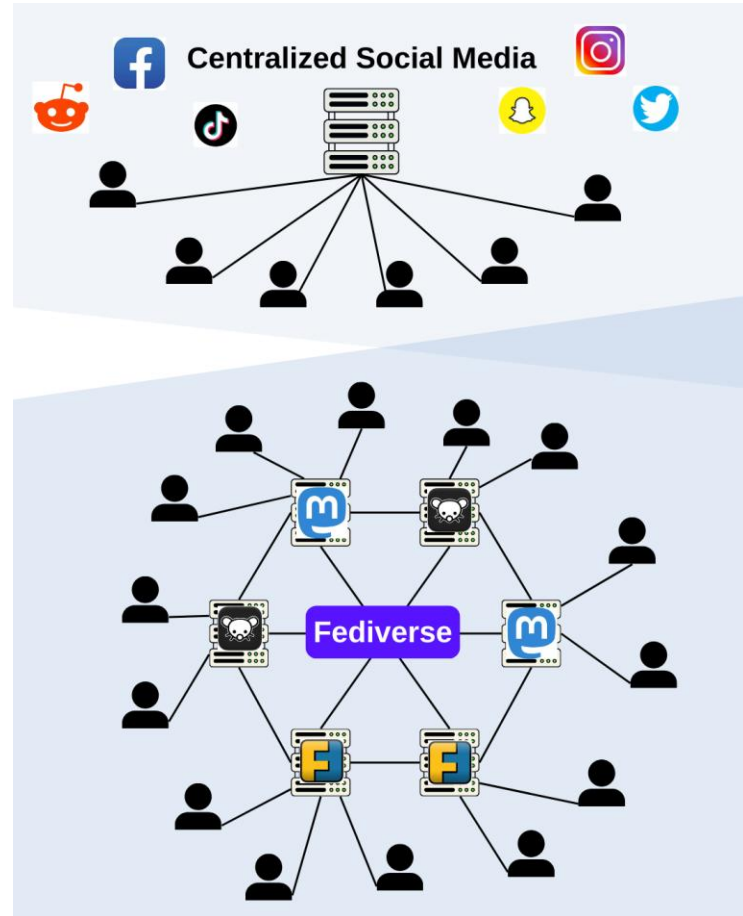
Online Discussion

I don't think online discussion has ever really succeeded as a format

Linear Discussion Lists

Threaded Discussion Lists

Linear-Threaded Discussion Lists
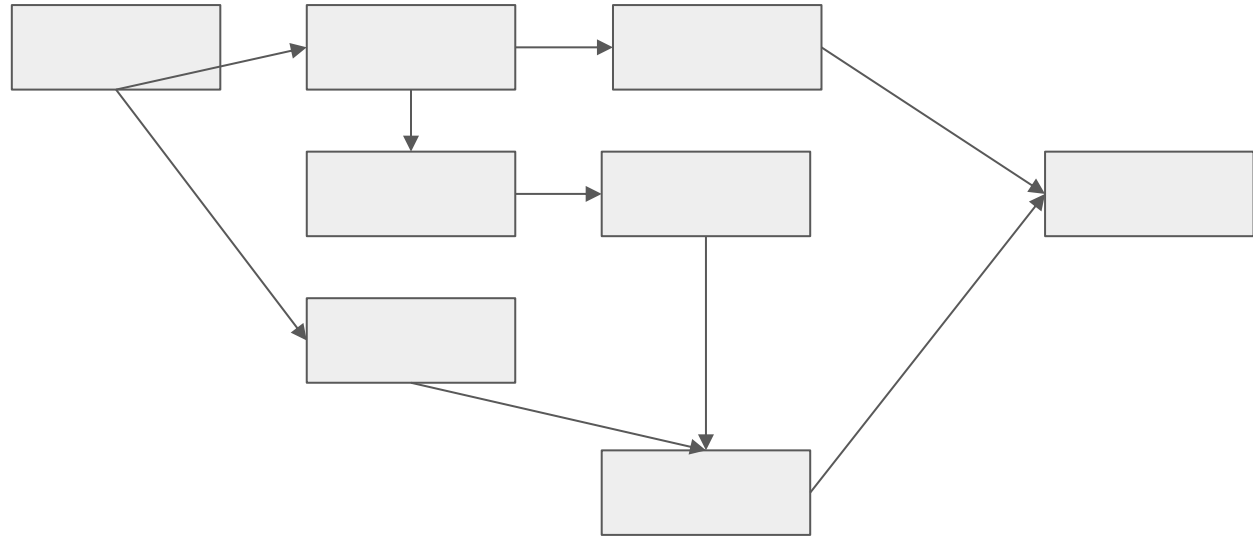
Convergent

This is a pattern very common in scientific literature but mostly absent from social media

Convergence in Scientific Literature
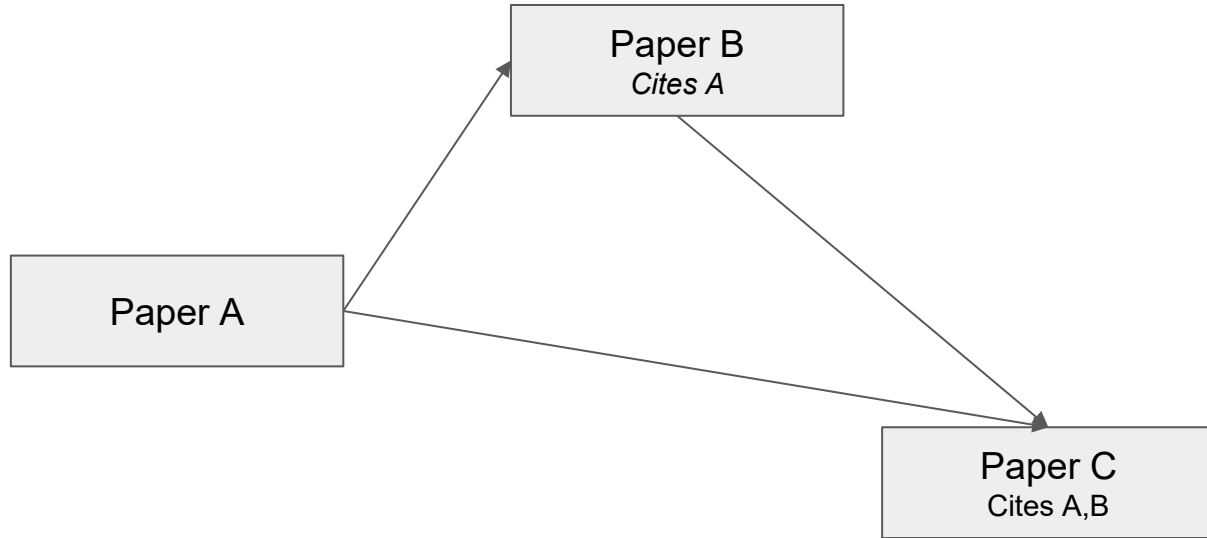
Some (AI) Tools for Convergence
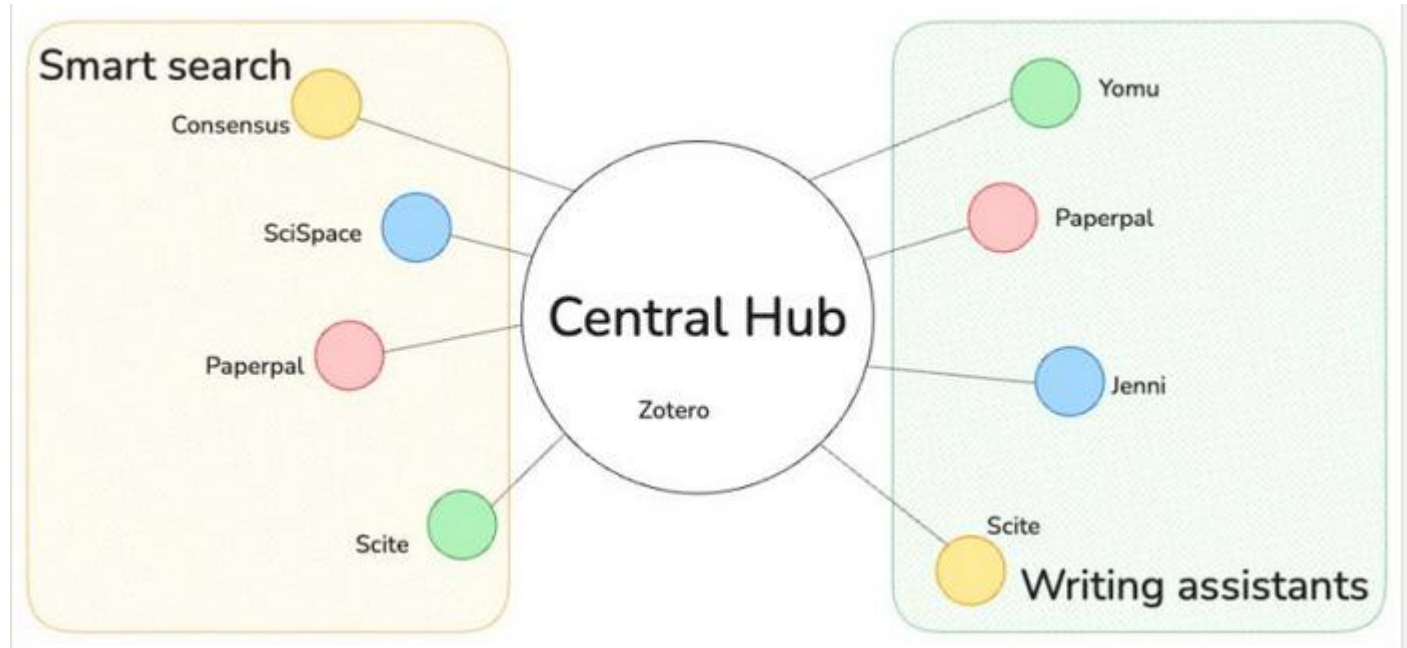
My Approach

Social Network

Blogs

Articles

Writing Space

List of references

Social Network

Blog Post

Article

Flow

Left
Pane

Read
Pane

Write
Pane

Right
Pane

Aggregate

Remix

Repurpose

Feed Forward
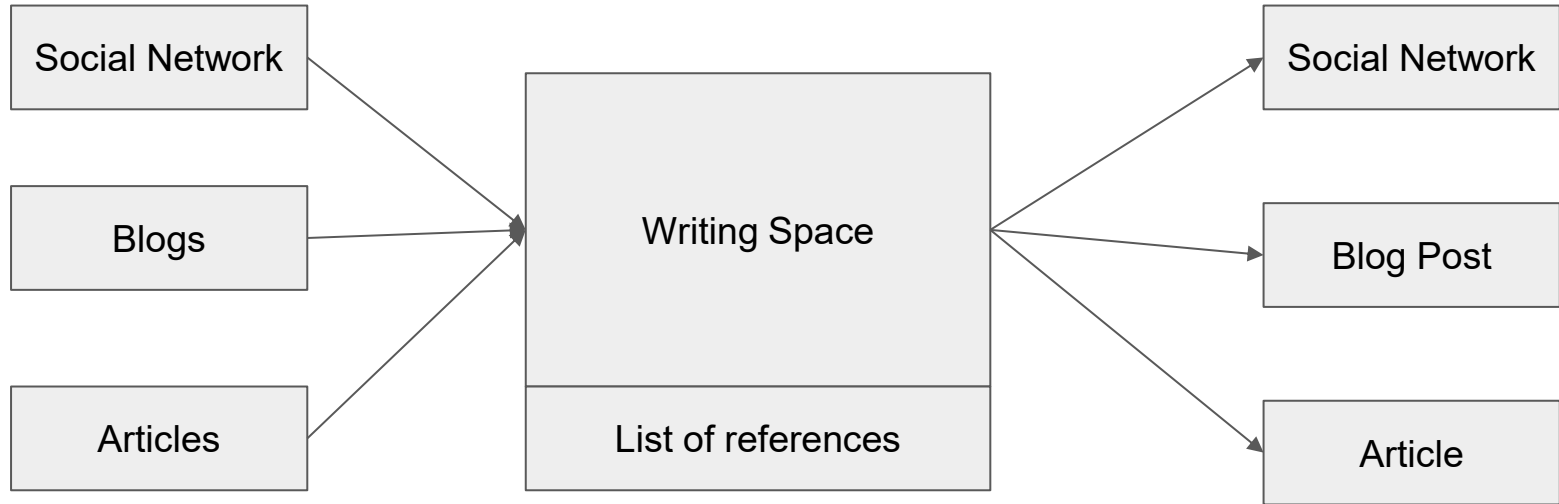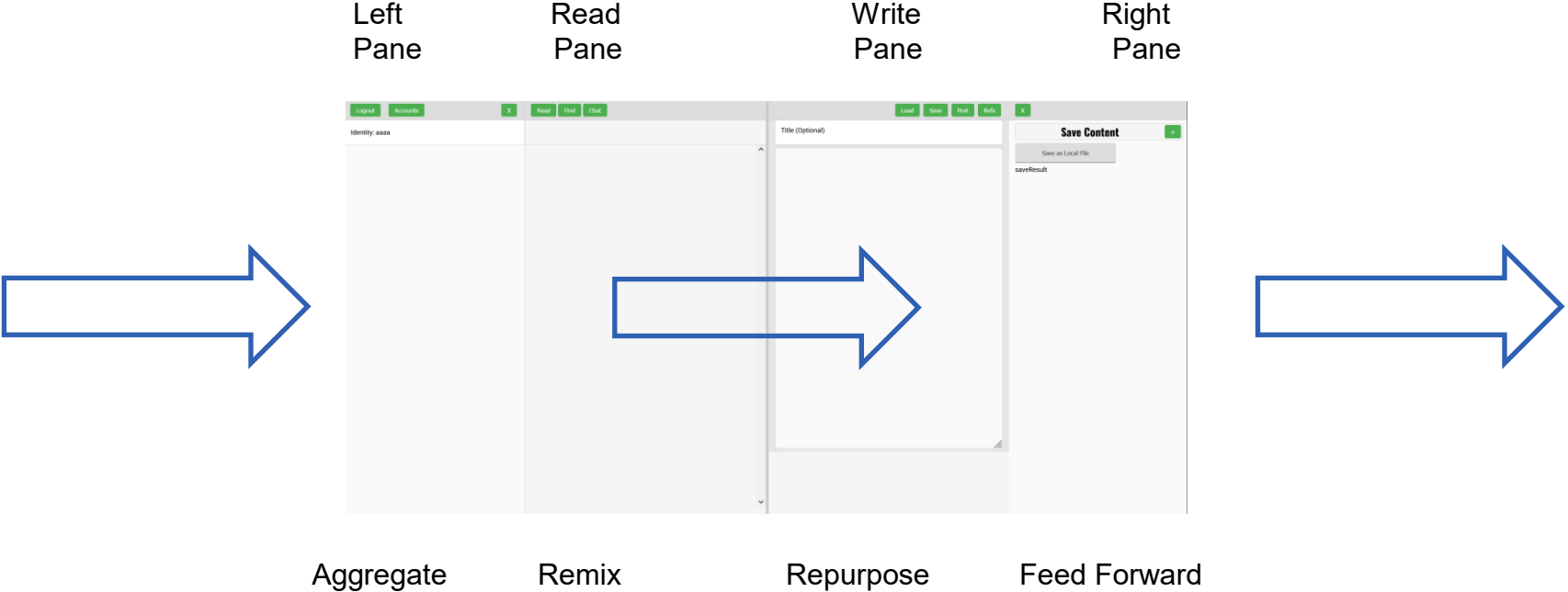
Caveats

- This is a *prototype,* not a completed application
- This is a *live demo,* so some things might not work
- Yes, *other people* have done some of the same things
- No, *it's not* fully secure against all possible attacks
- I know that other people could have *coded it better*

Design Considerations

- This is a *single user* application, not a multi-user platform
- It's completely open source CC-by to be *used by anyone*
- As a whole it is designed to be *distributed and decentralized*
- It is as *simple as possible*, so anyone can use it
- The ideal is that it can *run anywhere* (still working on that)
- Mostly plain *HTML-JS-CSS* (no Node, no React, no crazy installs)

OK Let's Get Started

Identity Server and Accounts

KVStore

kvstore.js

Each service is enabled by a standalone JS, in this case, kvstore.js

Scripts provide information to Clist in a standardized format, in this case an accounts array with values in a JSON object

Obviously, we would like a more robust identity server for the future.

Flasker
- Identity server and accounts
- Simple Flask key-value store

```
let flaskSiteUrl = 'https://datastore.downes.ca';
// Base URL of your identity server
```

Design Considerations

Issues related to decentralized identity

- OAuth2 https://autho.com/intro-to-iam/what-is-oauth-2
- OIDC https://openid.net/developers/how-connect-works/
- Self-Sovereign Identity

  https://en.wikipedia.org/wiki/Self-sovereign_identity

Key-Value Stores

- Cloud, e.g. Vault
- Host, e.g. 1Password

Dock. Decentralized Identity: The Ultimate Guide.
https://www.dock.io/post/decentralized-identity
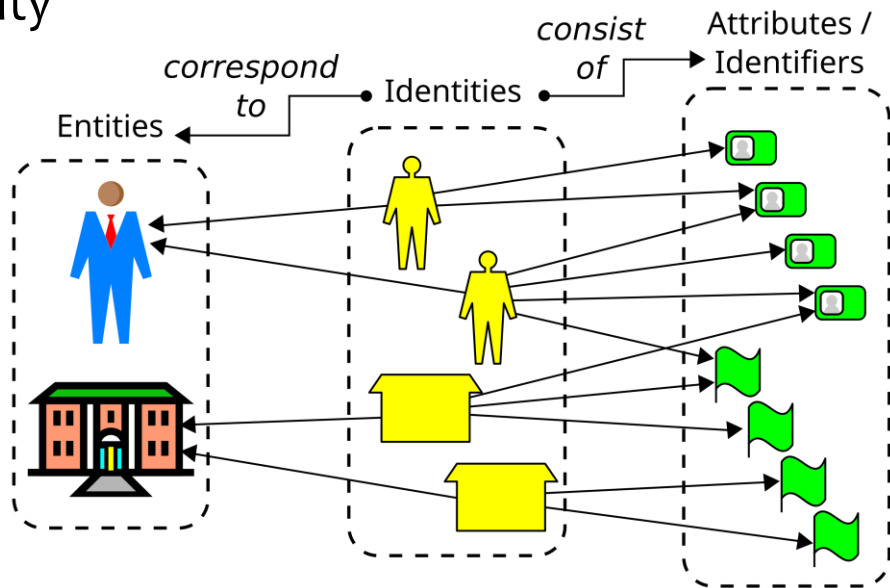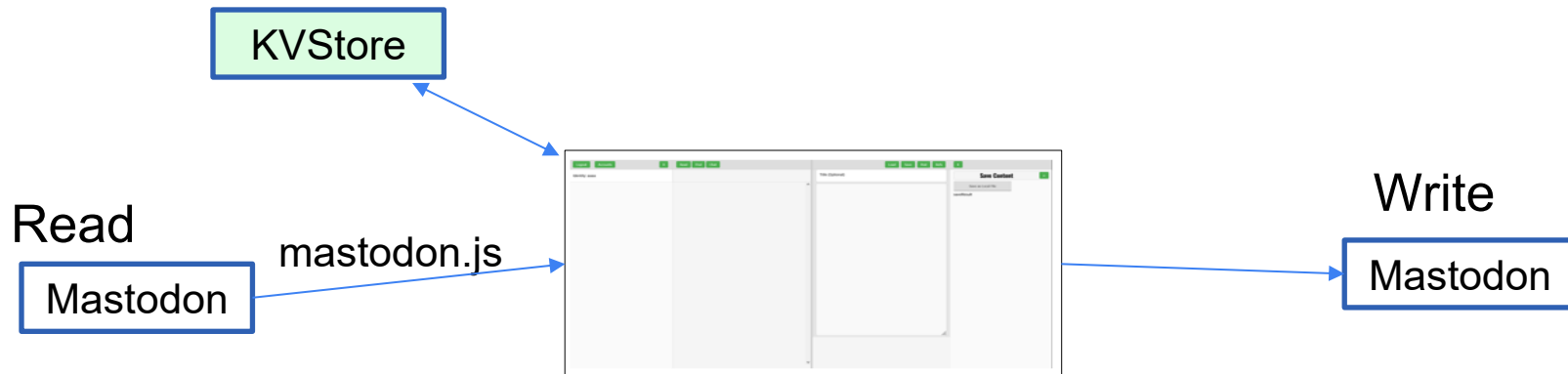
Mastodon

KVStore

Read

Mastodon

mastodon.js

Write

Mastodon

Mastodon

Image:
https://softwaremill.com/the-architecture-of-mastodon/
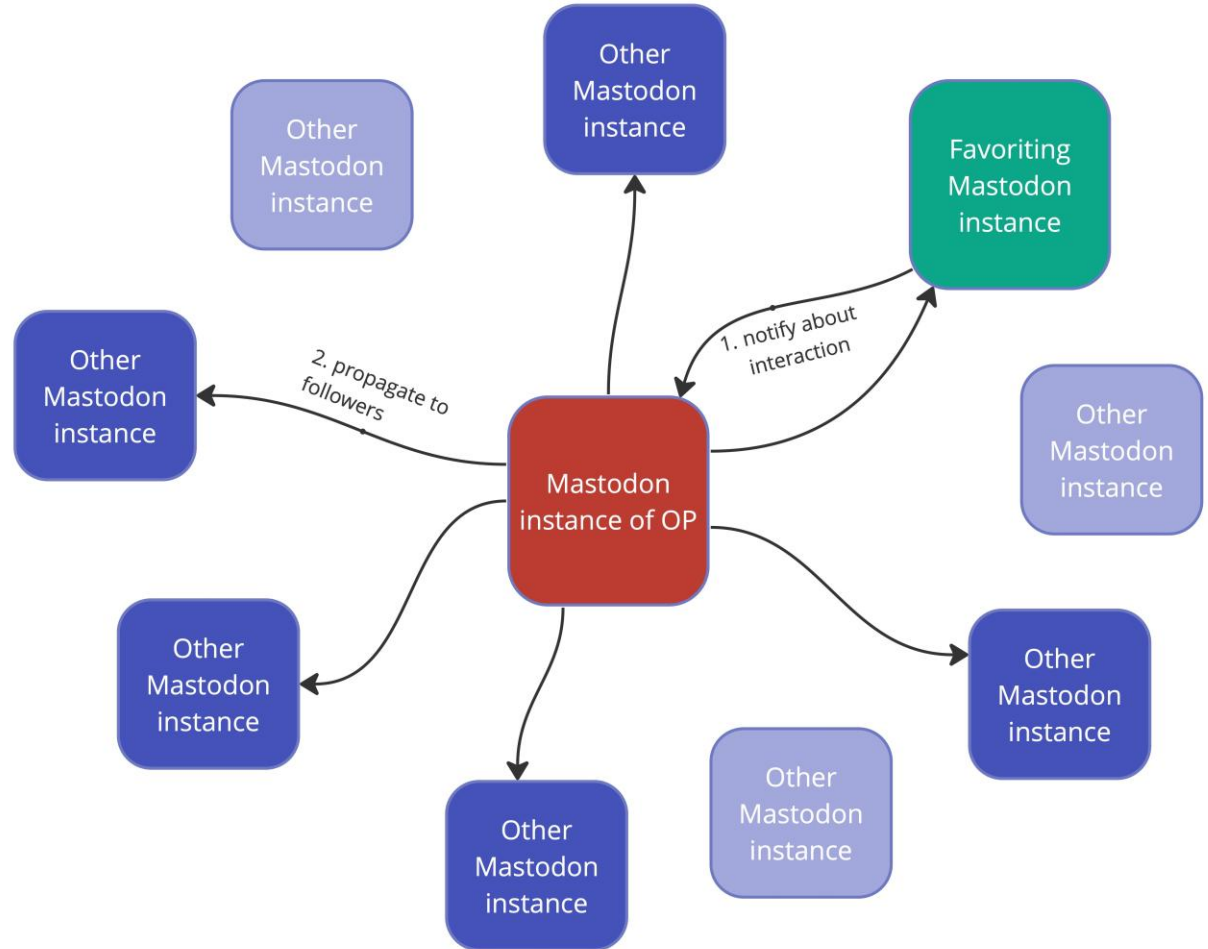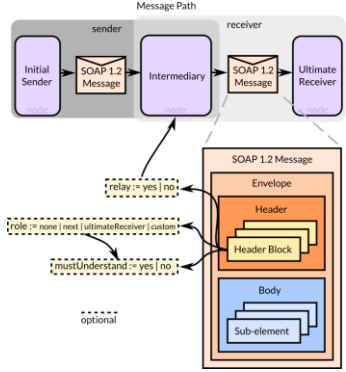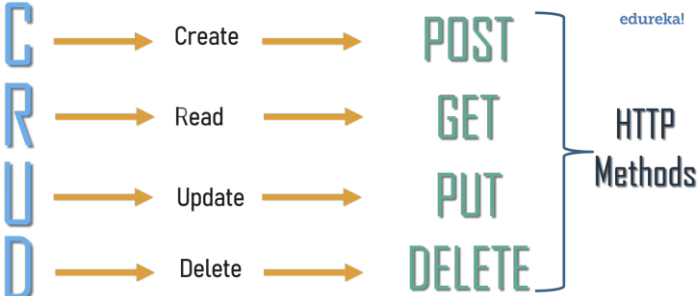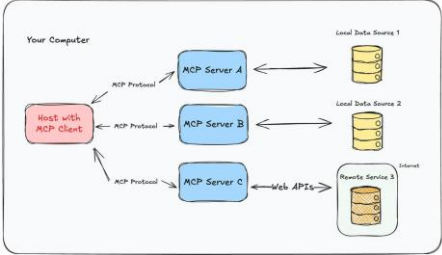
Mastodon
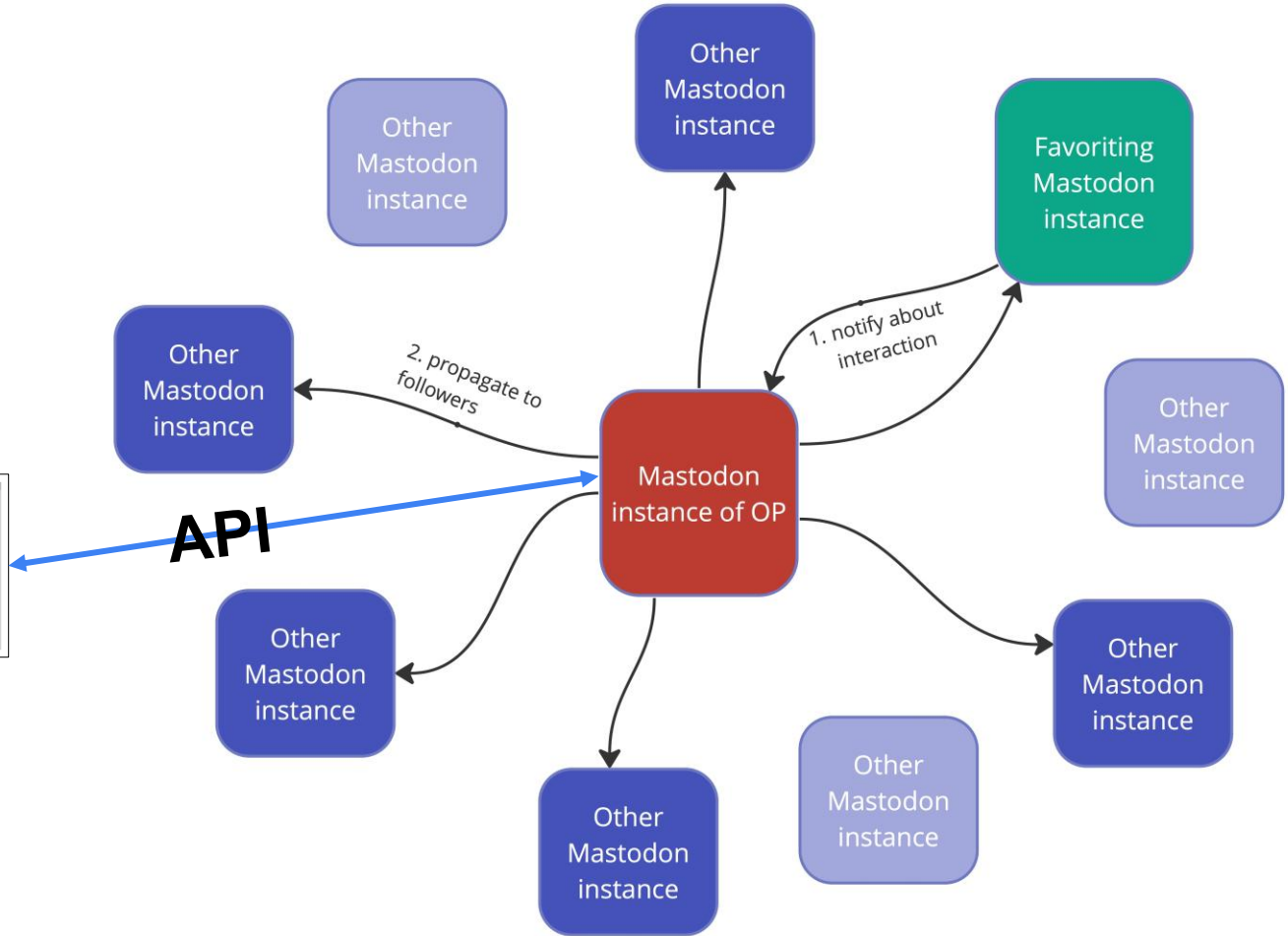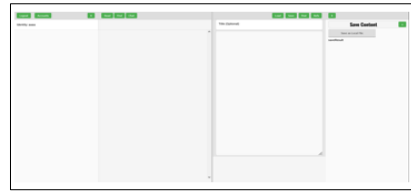
Three Generations of APIs

SOAP	REST	MCP
https://garba.org/article/general/soa/soap.html	https://www.edureka.co/blog/what-is-rest-api/	https://medium.com/@elisowski/mcp-explained-the-new-standard-connecting-ai-to-everything-79c5a1c98288

Auto-Translation

And Auto-Accessibility…?

KVStore

Google AI

Read

translate.js

tr

Mastodon

Post

Mastodon
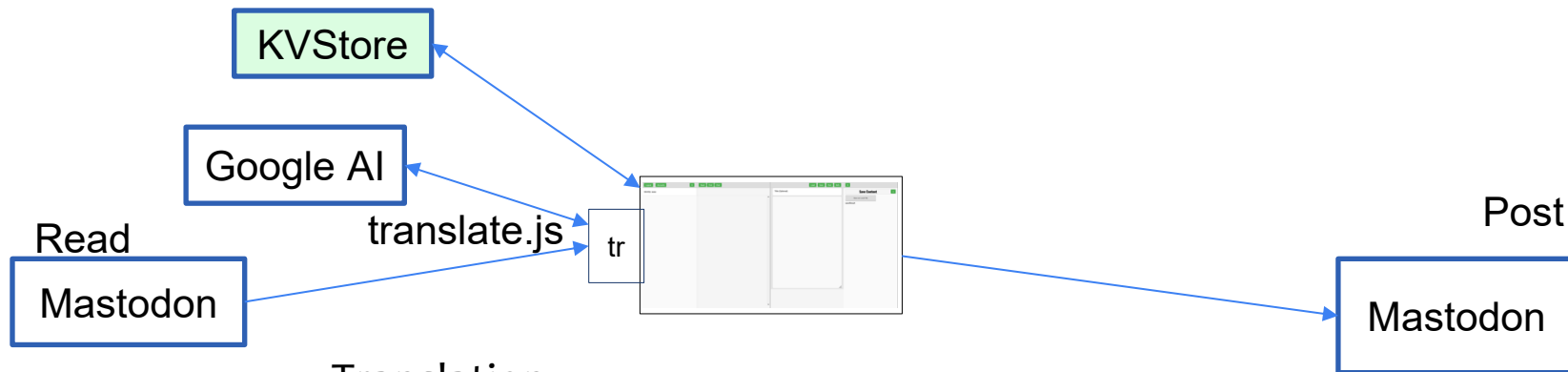
Translation
- Account from AI translation service
- Optional and need not be used
- Raises AI costs

https://cloud.google.com/translate

Bluesky

KVStore

Google AI

Read

Mastodon

Bluesky

bluesky.js

tr

Post

Mastodon
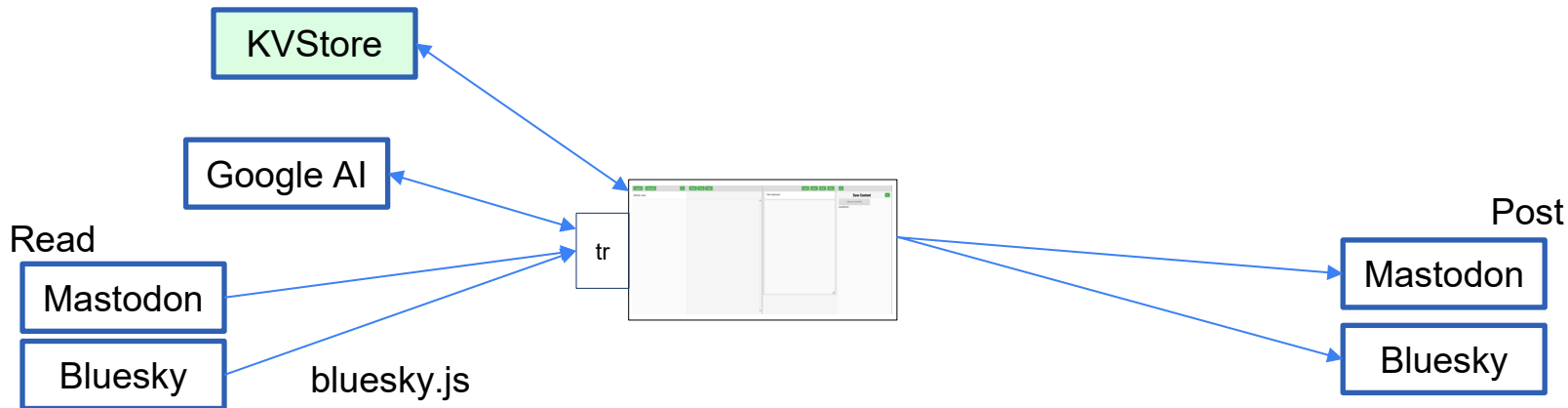
Bluesky

Bluesky
- Accounts from multiple servers (if we ever get multiple servers)
- Multiple accounts from the same server

https://bsky.app/

Fediverse Protocols

Three major decentralized protocols have emerged:

- Fediverse (#ActivityPub) – The most established and widely used, forming a "native" backbone of the #openweb.
- Bluesky (#AtProto) – A Twitter-funded project that claims decentralization but is still highly centralized.
- Nostr – A relay-based, censorship-resistant protocol with interesting tech but major cultural and usability challenges.

hamish campbell. 2025. Comparing Decentralized #openweb Protocol. Medium. https://hamishcampbell.com/comparing-decentralized-social-protocols-why-activitypub-fediverse-is-the-best-choice-over-bluesky-atproto-and-nostr/

Feed and Status Actions

Mastodon

| Post | Following | Bookmarks | Lists | Local | Hashtag | User |

@weblearning (@weblearning@social.ds106.us) wrote:
Now that's very interesting. This {{Databoks}} is how you
include an infobox information in af wikipedia. I presume it
pulling the info from wikidata.org?

↩ ↻ ★ 🔖 ↗ ⧉

Bluesky

| Post | Timeline | Favorites | Pinned | Recommended | What's Hot | Search |

OLDaily (@OLDaily) wrote: It's time to redefine how we learn
and connect #oldaily https://www.downes.ca/post/77533 This
post links to the YouTube site where I will be making an
announcement next Monday, the 27th, at 12 noon Eastern (5
pm UTC).

↩ ♥ ↻ ↗

↩ Reply

↻ Boost

⧉ Thread

↗ View Original

★ Favorite

♥ Like

🔖 Bookmark

▸ Repurpose

Thread Summary

KVStore

Google AI

Read

Mastodon

Bluesky

t
r

summarize.js

OpenAI

Post

Mastodon

Bluesky
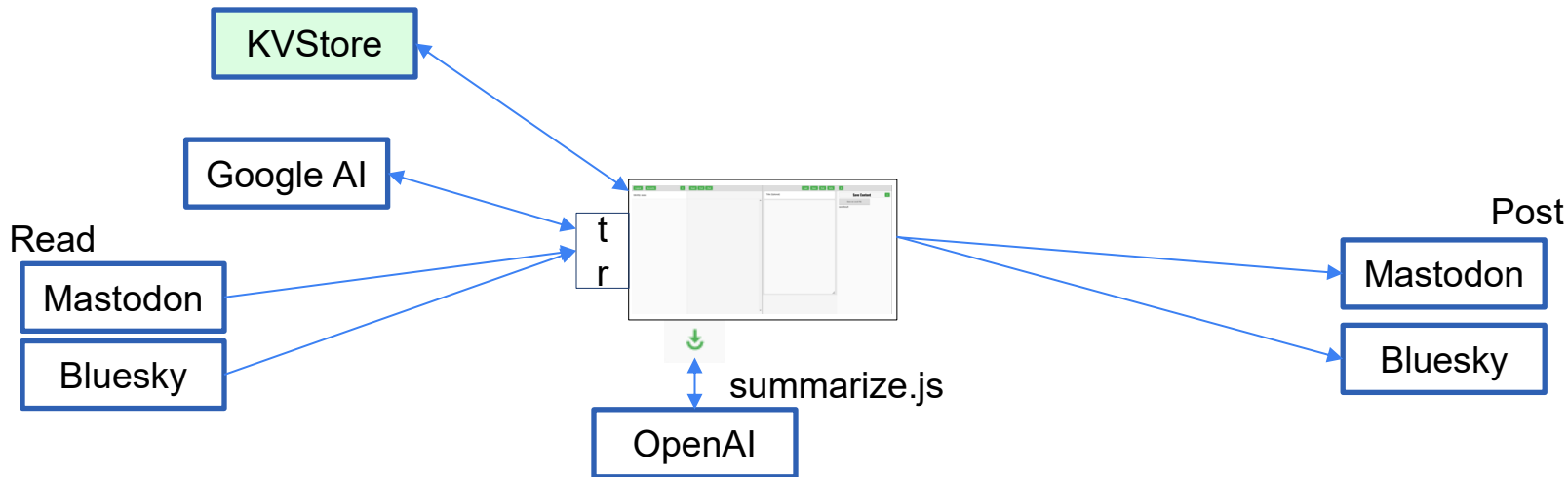
Thread Summarizer
- Account from AI summarization service
- Thread (or whatever) fed to summarizer service
- Summary becomes new feed item

Content Feeds: OPML and RSS

KVStore

Google AI

Read

Mastodon

Bluesky

RSS → OPML2JSON

opml.js

t
r

OpenAI

Post

Mastodon

Bluesky
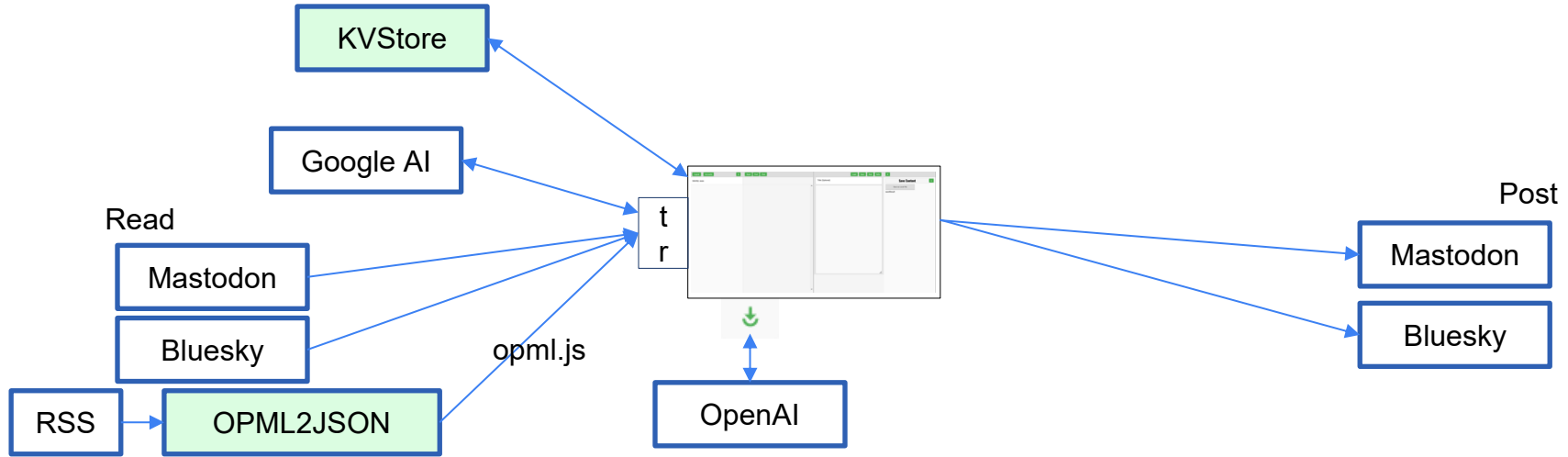
Retrieving and Reading RSS
- Standalone https://opml2json.downes.ca deployed
- OPML URLs are entered as accounts

Audio Content: Podcast Player

KVStore

Google AI

Read

Mastodon

Bluesky

RSS

OPML2JSON

tr

reader.js

OpenAI

Post

Mastodon

Bluesky
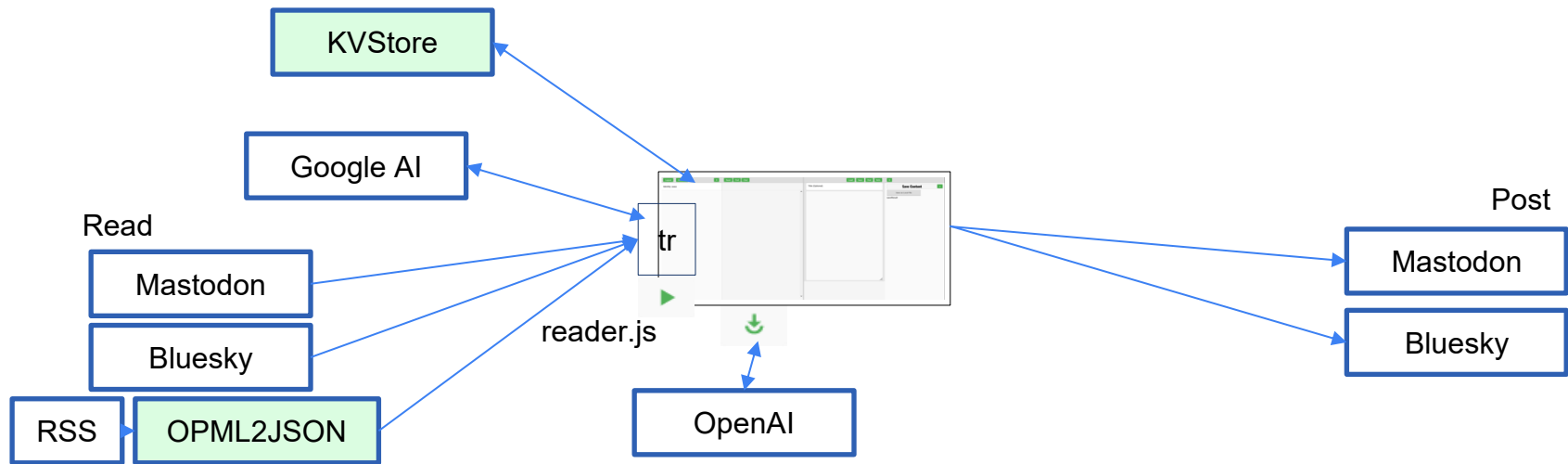
Create and Play Podcast List
- RSS reader detects audio enclosures in feed
- Builds playlist in audio player

Convergence
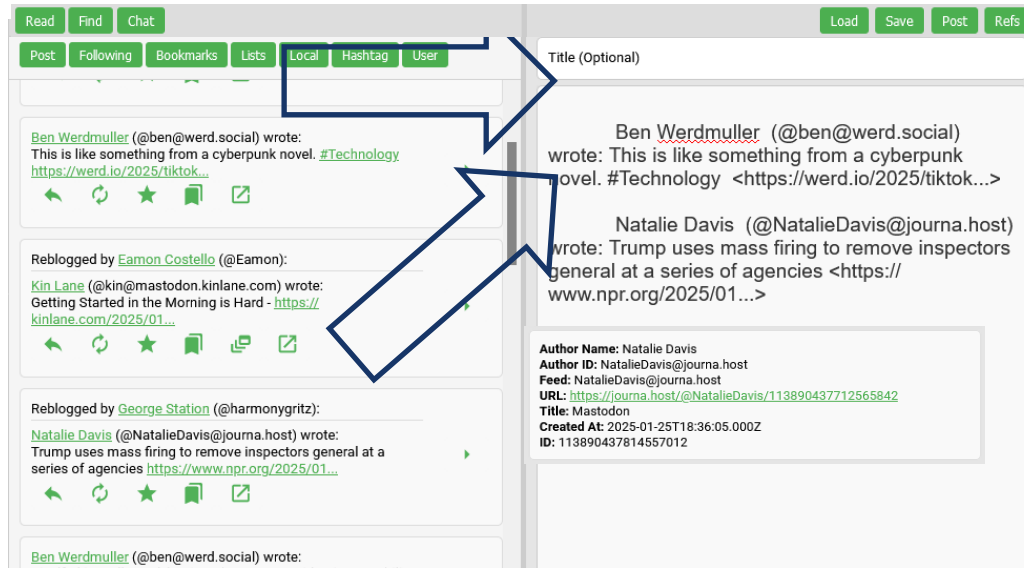
Convergence = Reply to Multiple Posts at Once
- Place content from any feed into the editor
- Clist keeps track of each source for reply notifications
- Click 'Refs' to toggle the full list of references

Preloading Content

Load Content

Load blank editor

Load from file system

Load template

Generate new template

Load Etherpad

Load

File Template Cloud

Load

editors.js

KVStore

Google AI

Post

Read

Mastodon

Bluesky

RSS → OPML2JSON

t r

OpenAI

Mastodon

Bluesky
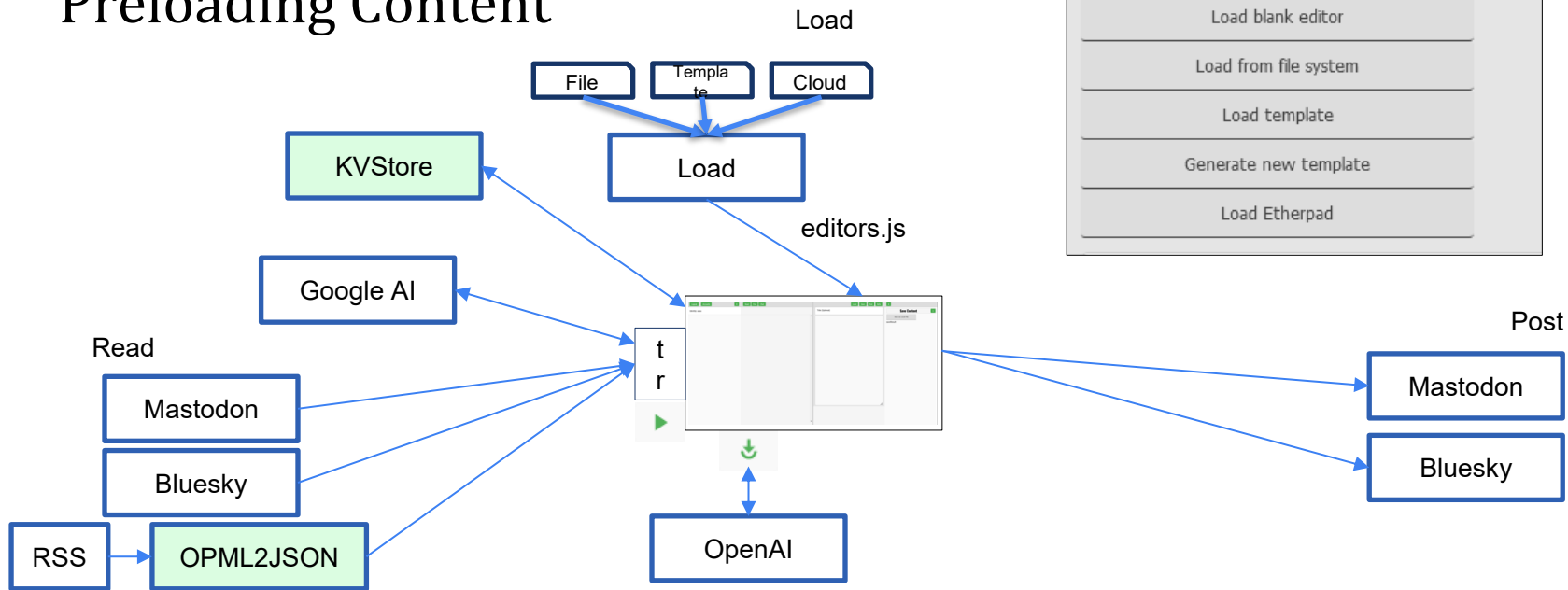
Loading Content
- Editing area can be preloaded with content
- Context may be stored locally, generated, or cloud-based
- Feed content then loaded in editing context

Templates

chatgpt.js

OpenAI

Load

Text   HTML

tinymce.js

File   Template   Cloud

KVStore

Load   →   Editors

Google AI

Read

Mastodon

t r

Bluesky

RSS → OPML2JSON

OpenAI

Post

Mastodon

Bluesky
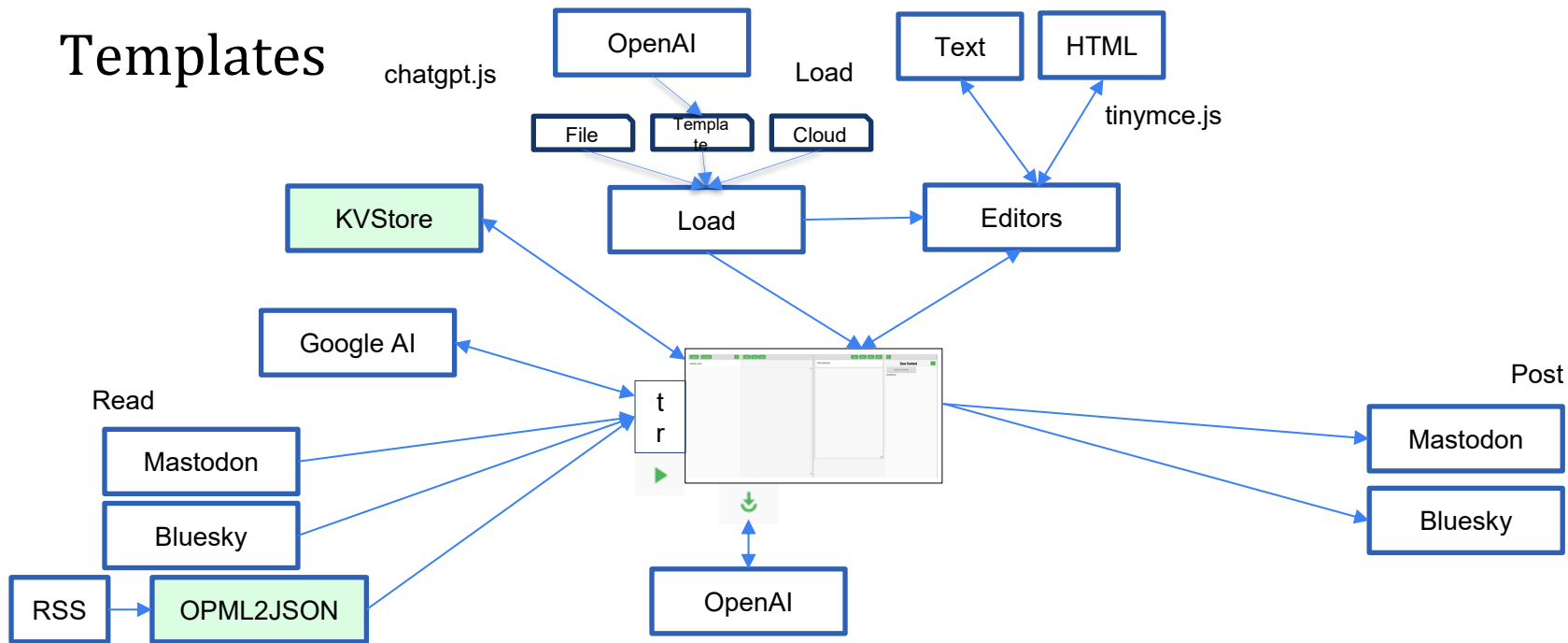
Predefined or Generated Templates
- Select template from template library (not yet available)
- Generate template on demand from generative AI
- Templates can be editor-specific

Editors
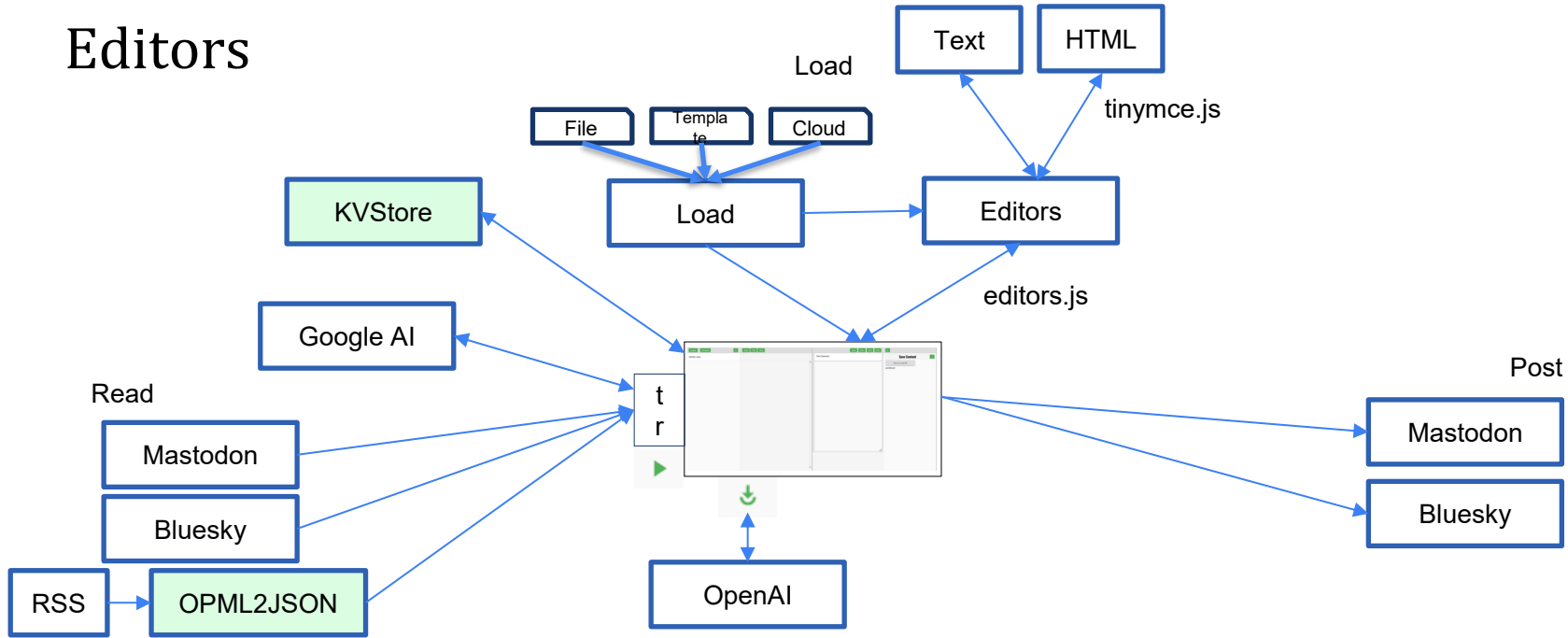
Selecting Editors
- After content load is selected, editor is selected
- Editor selection may be based on content type
- Future: image editors, games, applications

The Open Editor Apocalypse

```
98
99    //link copy
100
101    var $temp = $("<input>");
102    var $url = $(location).attr('href');
103
104    $('.play_all').on('click', function() {
105        $("body").append($temp);
106        $temp.val($url).select();
107        document.execCommand("copy");
108        $temp.remove();
109        $("copyUrl").text("URL copied!");
110    
```

W3C. execCommand() https://w3c.github.io/editing/docs/execCommand/
David Dal Busco. 2020. Reimplementing doc.execCommand.
https://medium.com/swlh/reimplementing-document-execcommand-6ffc33a80f02

Collaboration

OpenAI

Load

Text

HTML

Etherpad

File

Template

Cloud

KVStore

Load

Editors

Proxyp

editors.js

Google AI

Read

Mastodon

Bluesky

RSS

OPML2JSON

t
r

Post

Mastodon

Bluesky

OpenAI
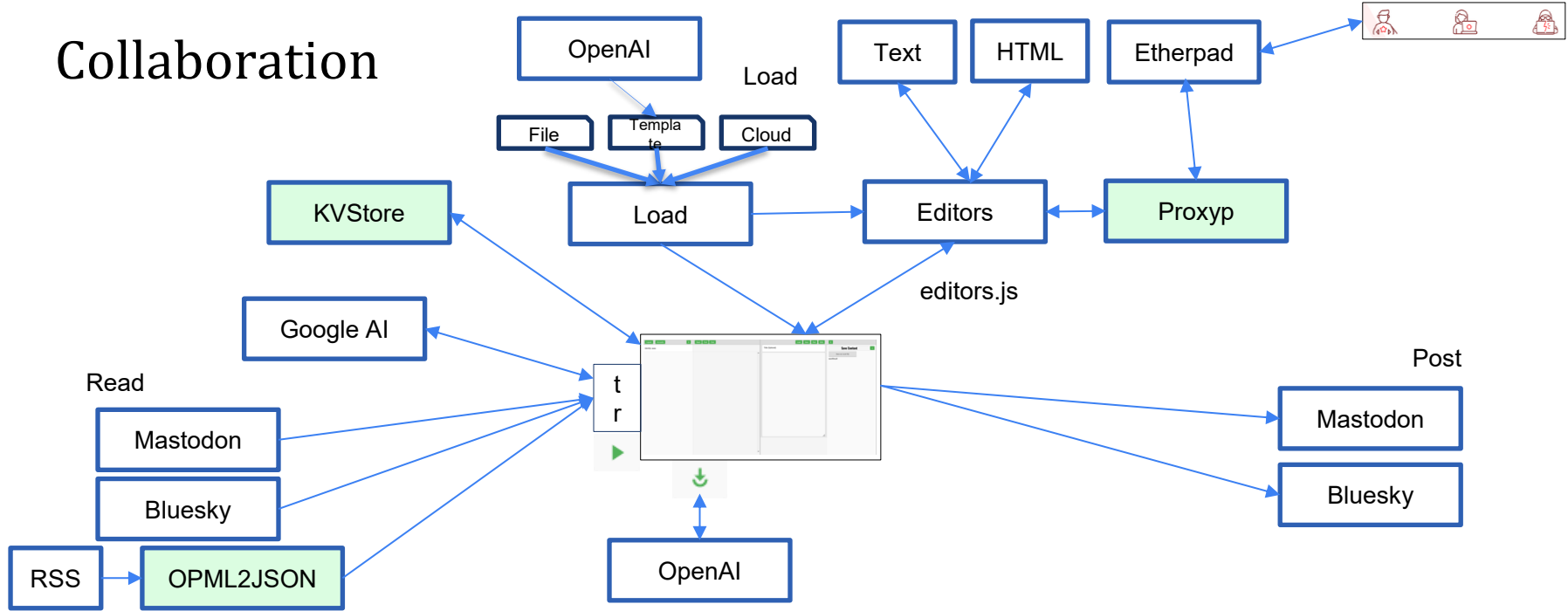
Collaborative Editing
- Editors can support multiple users
- Current configuration supports EtherPad
- In this case, Etherpad is access through proxy server

The OPTIONS Conundrum

The HTTP OPTIONS method is a request used to determine the communication options available for a specific resource, including the supported HTTP methods and other options. It's often used in the context of Cross-Origin Resource Sharing (CORS) preflight requests, where a browser sends an OPTIONS request before making a request that is not considered a simple request. 🔗

If a non-standard response header is required (e.g. 'X-Access-Code') a 'preflight check' is performed using HTTP method 'OPTIONS' – which fails as a CORS error if the server does not allow OPTIONS

```
⊗ Access to XMLHttpRequest at 'http://localhos  localhost/:1
  t:8080/api/csv' from origin 'http://localhost:3000' has
  been blocked by CORS policy: Response to preflight
  request doesn't pass access control check: No 'Access-
  Control-Allow-Origin' header is present on the requested
  resource.
⊗ ▶Uncaught (in promise) Error: Network     createError.js:16
  Error
      at createError (createError.js:16)
      at XMLHttpRequest.handleError (xhr.js:87)
```

Mozilla Developer's Network https://developer.mozilla.org/en-US/docs/Web/HTTP/Reference/Methods/OPTIONS

Chat and Share

dynamicp2p.js
peerjs.js

OpenAI

Load

Text   HTML   Etherpad

File   Template   Cloud

KVStore   Chat   Load   Editors   Proxyp

Google AI

Read

Mastodon

Bluesky

RSS → OPML2JSON

t r

▶

⬇

OpenAI

Post

Mastodon

Bluesky

Peer to Peer Chat
- Discussions are discovered via KVStore
- No central chat server required
- Chat insertion of, e.g., link to join etherpad

Discovery and Indexing

Decentralized discovery and indexing already exists:

- Telephone directory services
- DNS

Blockchain-style decentralized consensus
- Byzantine Generals Problem

Search and Find

OpenAI

Load

Text · HTML · Etherpad

File · Template · Cloud

KVStore · Chat · Load · Editors · Proxyp

Google AI

Read

Mastodon

Bluesky

OPML2JSON

t r

Post

Mastodon

Bluesky

OpenAI

Find

DuckDuckGo

reader.js

Google · Proxyp

OASIS

Resource Discovery

- Search results via open APIs
- Proxy also usable for search
- Future: people, courses, open data, etc

Save

OpenAI

Load

Text   HTML   Etherpad

File   Template   Cloud

Chat   Load   Editors   Proxyp

KVStore

Google AI

Read

Mastodon

Bluesky

RSS → OPML2JSON

Find

DuckDuckGo

Google

Proxyp

OASIS

OpenAI

files.js

Save

Filesystem

Cloud

Post

Mastodon

Bluesky

Save Editor Contents
- Save to local file system (download for Firefox)
- Planned: save as selected file type
- Cloud save (e.g. AWS, Dropbox) not yet implemented

Post Articles

OpenAI

Load

Text   HTML   Etherpad

File   Template   Cloud

KVStore   Chat   Load   Editors   Proxyp

Google AI

Save

Filesystem

Cloud

Read

Mastodon

Bluesky

RSS → OPML2JSON

OpenAI

publish.js

Post

Mastodon

Bluesky

wordpress.js

Wordpress

blogger.js

Blogger

Find

DuckDuckGo

Google

Proxyp

OASIS

Create Blog Posts
- Wordpress, Blogger supported
- Future: Ghost, web pages
- Multi Post+Link Publishing

The Future…?

Open Data

Spreadsheets

Games

Simulations

H5P Editor

Graphing

VR

Discourse

Project Mgmt

Simulations

Jobs

Competencies

Diagrams

Mahara

Trilium

DID

OpenAI

Load

Text

HTML

Etherpad

Mattermost

Calendar

File

Template

Cloud

KVStore

Chat

Load

Editors

Proxyp

Content Addr.

Publish IPFS

Cloud Storage

Live Events

Google AI

Save

Filesystem

Peertube

Read

Mastodon

tr

Cloud

Ghost

Bluesky

publish.js

Post

Publications

Lemmy

RSS

OPML2JSON

OpenAI

Mastodon

DOAJ

Find

Bluesky

Podcast

Assessment

Course Library

DuckDuckGo

Proxyp

Remixer

Web Page

wordpress.js

Wordpress

blogger.js

Blogger

Badges

More OERs

Google

OASIS

Other AI

Slides

Mailgun

Devices

AI Agents

Shared Bookmarks

xAPI LRS

Zotero

Skills Profile