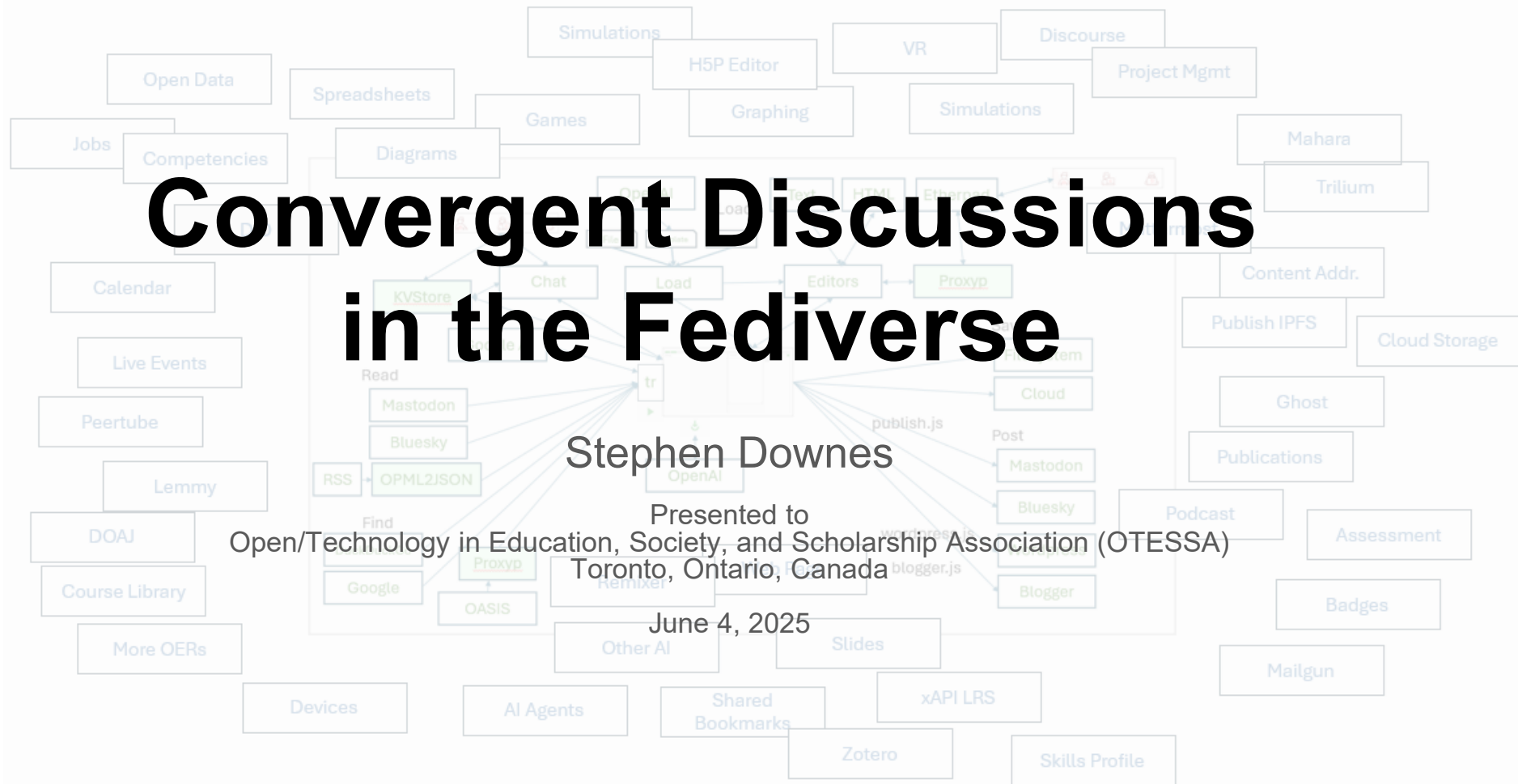


# Convergent Discussions in the Fediverse

Stephen Downes

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

June 4, 2025



# Start With The Demo

The screenshot displays the Mastodon web interface. On the left, a sidebar contains a 'Logout' button, an 'Accounts' tab, and a list of accounts: Downes, OLDaily, Cosocial, Bluesky, Test OPML, and Open-Ed OPML. Below this is a 'Manual' button and the URL 'https://mastodon.social'. The main feed area shows three posts. The first post is from OLDaily (@oldaily) about Roblox gaming time. The second is from Reclaim Hosting (@reclaimhosting@reclaim.rocks) about an event calendar. The third is a reblog by Peter Hanecak (@phanecak) about a political article. On the right, a 'Save Locally' panel is open, showing a 'Save As' button and a warning: 'The File System Access API is not supported in this browser. A file download will be used instead.' Below this is a 'Post content to...' section with a list of accounts and a 'Published' button. At the bottom right, a 'saveResult' section shows metadata for the saved post, including author, feed, URL, title, and creation date.

Logout Accounts X Read Find Chat

Identity: aaaa

**Read** X

Please select an account

- Downes
- OLDaily
- Cosocial
- Bluesky
- Test OPML
- Open-Ed OPML

Manual  
https://mastodon.social

Post Following Bookmarks Lists Local Hashtag User

OLDaily (@oldaily) wrote:  
Australian children who play Roblox spend average of 139 minutes a day on the gaming app, data shows #oldaily <https://www.downes.ca/post/...> The problem isn't 'motivation'.  
"Australian children who play Roblox are on the app for an average of 139 minutes a day and it is the gaming app most blocked by parents, a new industry report has found." The problem is designing learning technology people want to use as much as they want to use Roblox.

Reclaim Hosting (@reclaimhosting@reclaim.rocks) wrote:  
Announcing Bloggers Anonymous!  
<https://bavatusdays.com/bl...>  
We've got lots of things cooking on the event calendar, so make sure to check that out too:  
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Reblogged by Peter Hanecak (@phanecak):  
Dalibor Záhora (@daliborzz@twitter.cz) wrote:  
Šipová will compete with Hřib for the position of national leader Šipová and Hřib represent two different views of the Pirates. Hřib, with the New Wave initiative, pushed through changes that lead to greater concentration of power (e.g., it will not be possible to propose dismissal from office so easily). Šipová, on the other hand, advocated the original pirate values, i.e. greater influence of rank-and-file members on whether they will vote, for example, on whether a specific colleague should continue to be a minister or should leave office.  
#volby25 #pirát6pct  
<https://denikn.cz/1631830/h...>

Title (Optional)

B I

make sure to check that out too:  
<https://events.reclaimhosti...>

rna.host) wrote:  
I wrote about holiday celebrations held in spite of oppression, visiting the log in the Arctic that Fridtjof Nansen slept under in the winter of 1895-6, and why determination is better than inspiration.  
"Everything won't go wrong."  
A post for the New Year.

<https://degenerateart.beehi...>

Eugen Rochko (@Gargron) wrote:  
A hardened criminal... Always climbing the Christmas tree.  
#CatsOfMastodon #Caturday

Danie (@danie10@squeet.me) wrote:

n Build with tinymce

**Save Locally**

Save As

The File System Access API is not supported in this browser. A file download will be used instead.

**Post content to...**

Click on accounts to select then click 'Save'. Contents of the 'Write' panel will be posted on the selected accounts

- Downes
- OLDaily
- Cosocial
- Leftish
- Bluesky
- Half an Hour

Published

saveResult

**Author Name:** Reclaim Hosting  
**Author ID:** reclaimhosting@reclaim.rocks  
**Feed:** reclaimhosting@reclaim.rocks  
**URL:** <https://reclaim.rocks/@reclaimhosting/113867176472151583>  
**Title:** Mastodon  
**Created At:** 2025-01-21T16:00:26.000Z  
**ID:** 113867176669689177

<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

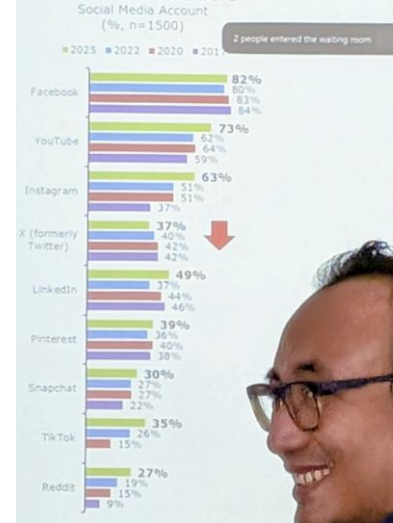
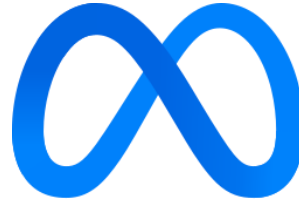
Wikipedia: “Criticisms include the outsize influence Facebook has on the lives and health of its users and employees, as well as Facebook's influence on the way media, specifically news, is reported and distributed.”

[https://en.wikipedia.org/wiki/Criticism\\_of\\_Facebook](https://en.wikipedia.org/wiki/Criticism_of_Facebook)

[https://en.wikipedia.org/wiki/Criticism\\_of\\_Twitter](https://en.wikipedia.org/wiki/Criticism_of_Twitter)

[https://en.wikipedia.org/wiki/LinkedIn#Criticism\\_and\\_controversies](https://en.wikipedia.org/wiki/LinkedIn#Criticism_and_controversies)

Trends image: Anatoliy Gruz, OTESSA 2025, photo by author



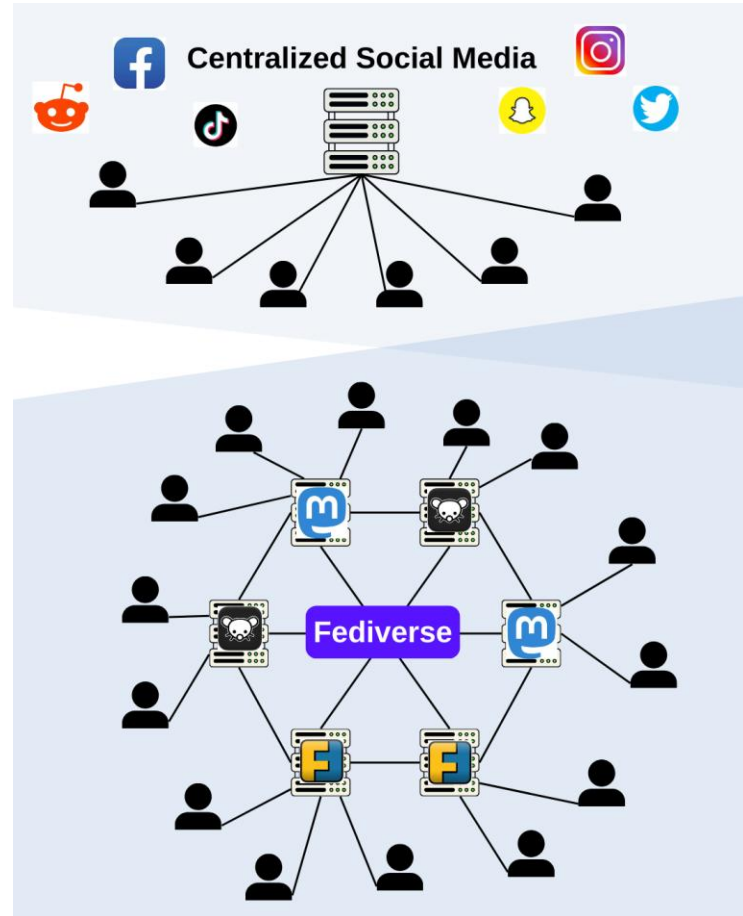
# The Fediverse

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

Some applications include:

- Mastodon
- Bluesky
- Lemmy
- Peertube
- Pixlfed

<https://aimresearch.co/market-industry/10-must-try-apps-in-the-fediverse-for-the-decentralized-social-media-revolution>



# Online Discussion

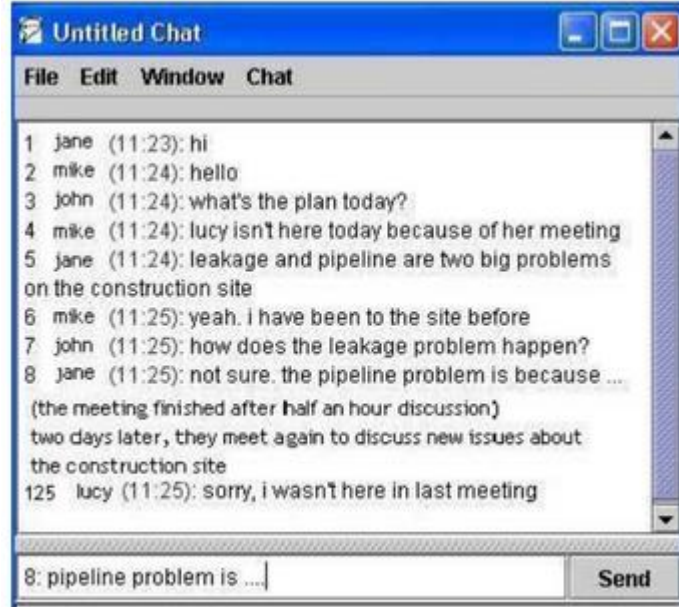
I don't think online discussion has ever really succeeded as a format

The image is a collage of four early online discussion platforms, each with a brief description and a screenshot of its interface.

- HotWired Piazza:** The Interactive Heart of HotWired. It features a central diamond logo with an eye. Below the logo are three categories: "ASK ALLISON" (with a woman's portrait), "RANTS & RAVES" (with a pink alien head), and "THREADS" (with a blue alien head). To the right of these categories are three columns of text: "You ain't gonna win if you don't enter! Ask Allison's swanky contest.", "Pithy, vitriolic, and eloquent comments from our members", and "Bulletin board discussion, comments, questions, and answers". Below these columns are three more columns of text: "Server-push pushes you into Threads. Clinton: chameleon or amoeba?", "Have your say. Hay today. No topic is off limits in HotWired Threads.", and "Have your say. Hay today. No topic is off limits in HotWired Threads."
- Slashdot:** A screenshot of the Slashdot website. It features a green header with the Slashdot logo and a navigation bar. Below the header are several article teasers with titles like "New DNS Software to Address Security Issues" and "The New DNS Software to Address Security Issues".
- Reddit:** A screenshot of the Reddit website. It features a white header with the Reddit logo and a navigation bar. Below the header are several article teasers with titles like "What video game caused you the most amount of rage?" and "As a person looking at the US from an outside perspective, why would you vote for Trump?".
- Discourse:** A screenshot of the Discourse website. It features a white header with the Discourse logo and a navigation bar. Below the header are several article teasers with titles like "howto" and "bug".

Hotwired Threads - <https://archive.gyford.com/1995/11/13/HotWiredDemo/piazza/index.htm> Moodle - [https://docs.moodle.org/22/en/Using\\_Forum](https://docs.moodle.org/22/en/Using_Forum)  
Slashdot - <https://slashdot.org/> Reddit - <https://www.reddit.com/> Discourse - <https://www.discourse.org/>

# Linear Discussion Lists



[https://www.researchgate.net/publication/220729380\\_Unraveling\\_the\\_ordering\\_in\\_persistent\\_chat\\_a\\_new\\_message\\_ordering\\_feature](https://www.researchgate.net/publication/220729380_Unraveling_the_ordering_in_persistent_chat_a_new_message_ordering_feature)

# Threaded Discussion Lists

Emne	Linjer	Afsender	-Dato
dk.admin			
dk.bolig fundats.	45	Gerner	12-07-2004 22:39:0
Re: dk.bolig fundats.	18	Peder Vendelbo	12-07-2004 22:51
Re: dk.bolig fundats.	27	Erik Olsen	12-07-2004 23:11
Re: dk.bolig fundats.	8	Peder Vendelbo	12-07-2004 23:20
Re: dk.bolig fundats.	9	Peter Lykkegaard	12-07-2004 23:05
Re: dk.bolig fundats.	42	Knud Berggreen	12-07-2004 23:42
Re: dk.bolig fundats.	13	Bertel Lund Hans	13-07-2004 00:33
Re: dk.bolig fundats.	19	Knud Berggreen	14-07-2004 23:25
Re: dk.bolig fundats.	20	Bertel Lund Hans	15-07-2004 02:03
Re: dk.bolig fundats.	9	Peter Juhl	13-07-2004 00:31
Re: dk.bolig fundats.	19	Deaster	13-07-2004 08:26
Re: dk.bolig fundats.	33	Peder Vendelbo	12-07-2004 23:19
dk.bolig umodereret (9)	28	Gerner	11-07-2004 18:07
Ændring af dk.boligs status til umodereret gruppe (68)	41	Svend Erik Jense	09-07-2004 23:31
Indlæg i dk.bolig - ventetid (42)	14	Christian Joerge	08-07-2004 10:57
dk.livssyn.kristendom.modereret - Konkusion? (10)	31	Cyril Malka	04-07-2004 10:15
Misbrug i dk.sport.fodbold (2)	12	Rasmus Thorse	27-06-2004 22:43
Ansøgning om oprettelse af nyhedsgruppe : dk.fritid.s	24	K	10-06-2004 10:16

[https://en.wikipedia.org/wiki/Thread\\_%28online\\_communication%29](https://en.wikipedia.org/wiki/Thread_%28online_communication%29)



# Linear-Threaded Discussion Lists



**Paul Clapman** @paulclap · 16 Mar 2014

@nikegolf you need to show one of these #justdoit tweets when there's a foot of rain coming down. Welcome to my world. :)



**Nike Golf** @nikegolf · 17 Mar 2014

@paulclap Commitment is waterproof. #justdoit



**Dave Winder** @RacerDave23 · 16 Mar 2014

@nikegolf good advice. It's that time. @Matthew\_Winder



**Nike Golf** @nikegolf · 17 Mar 2014

@RacerDave23 Did you make it to the course?

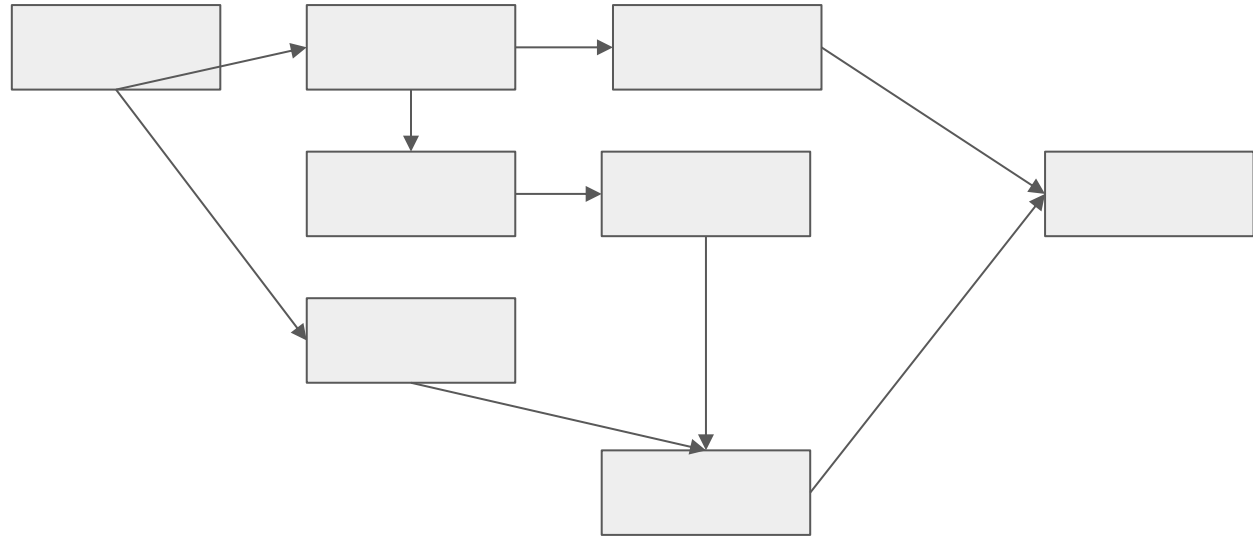


**Dave Winder** @RacerDave23 · 17 Mar 2014

@nikegolf: my fav sport is watching @Matthew\_Winder play!

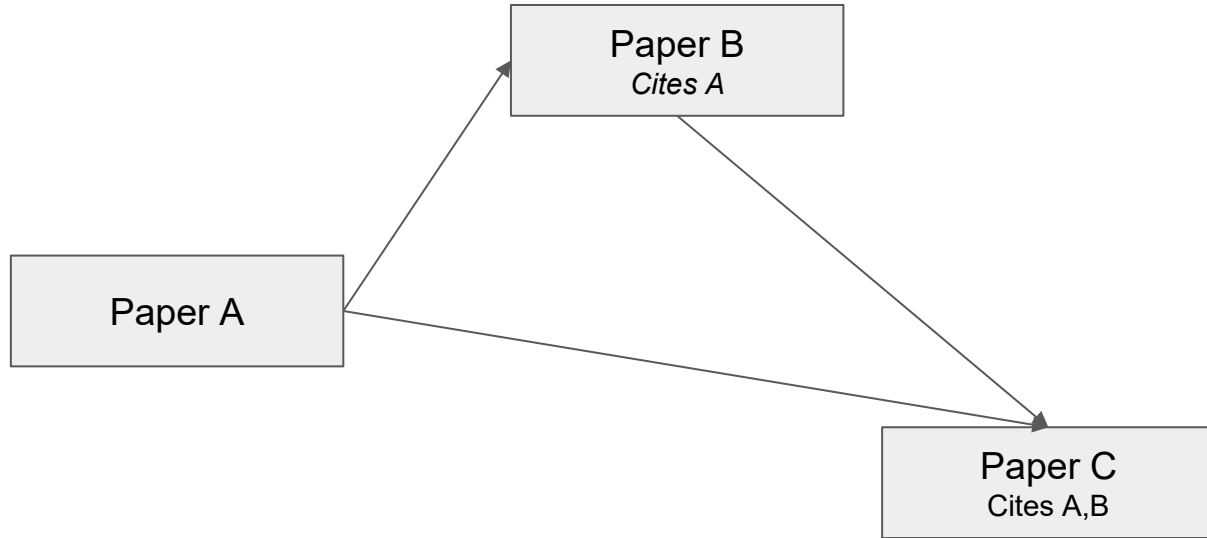


# Convergent

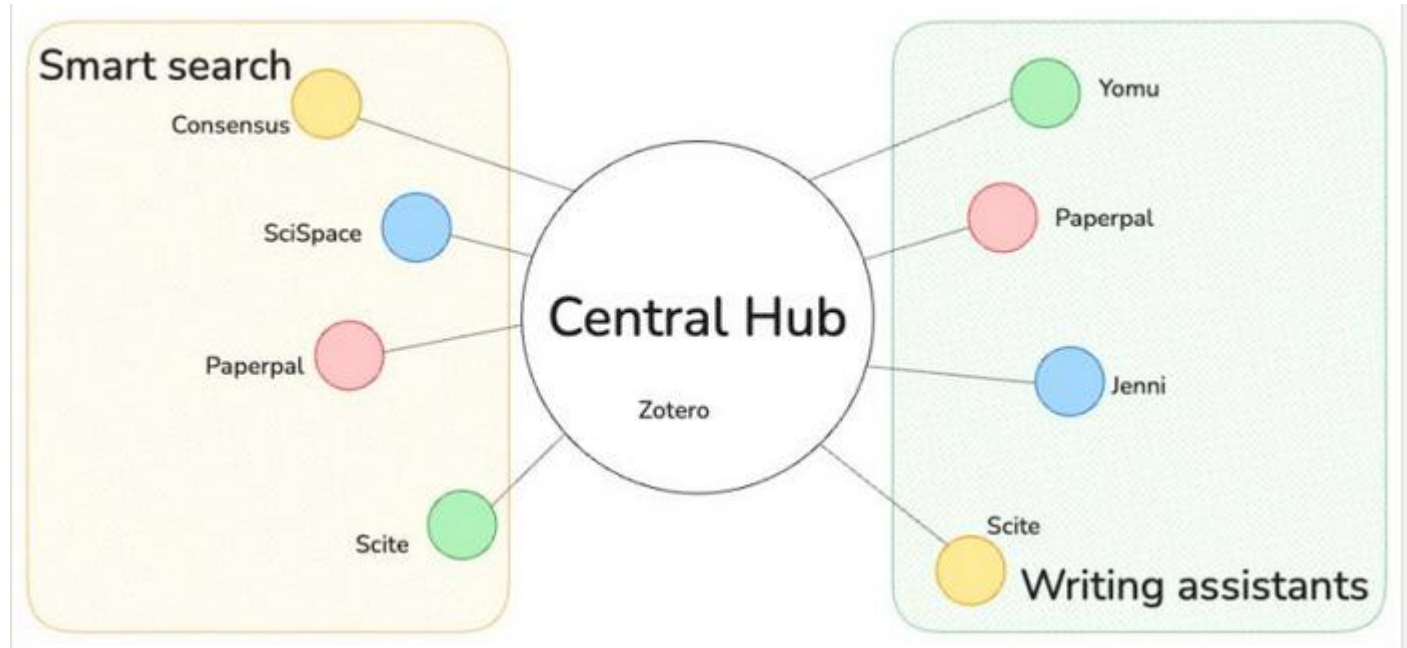


This is a pattern very common in scientific literature but mostly absent from social media

# Convergence in Scientific Literature

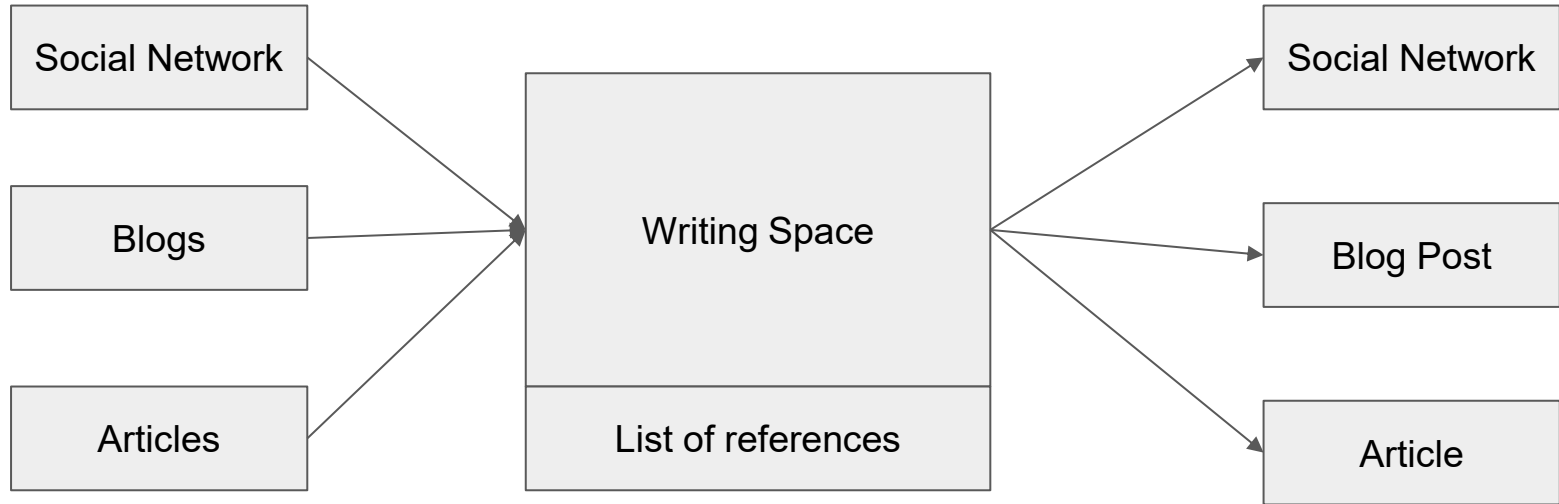


# Some (AI) Tools for Convergence

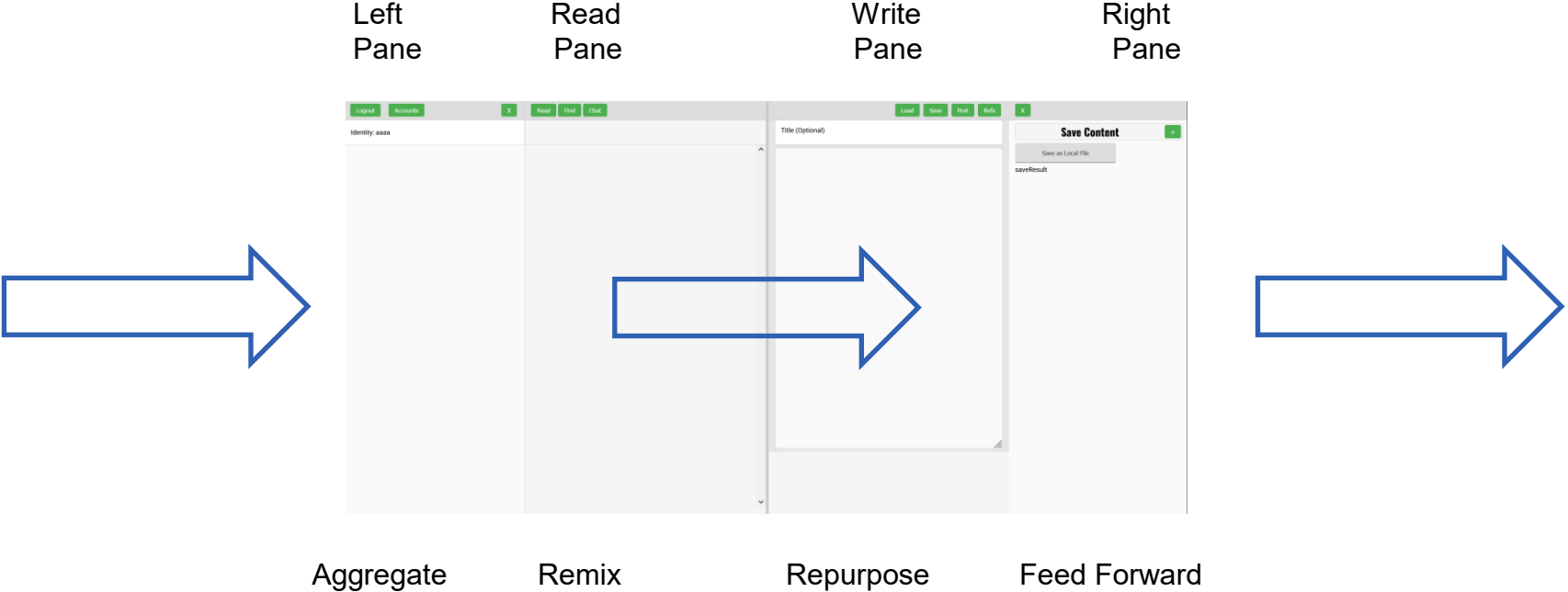


[https://www.linkedin.com/posts/nacke\\_phd-research-writingtips-activity-7261003352866533377-y6YV](https://www.linkedin.com/posts/nacke_phd-research-writingtips-activity-7261003352866533377-y6YV)

# My Approach



# Flow



# 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

LogoutAccountsX

Identity: aaaa

ReadX

Please select an account

Downes

OLDaily

Cosocial

Bluesky

Test OPML

Open-Ed OPML

Manual

https://mastodon.social

ReadFindChat

PostFollowingBookmarksListsLocalHashtagUser

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↩️↺️★📖✍️

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Announcing Bloggers Anonymous!  
<https://bavatusdays.com/bl...>  
We've got lots of things cooking on the event calendar, so make sure to check that out too:  
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#volby25 #piráti6pct  
<https://denikn.cz/1631830/h...>



LoadSaveRefsX

Title (Optional)

B I 🔗 📎 <>


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I wrote about holiday celebrations held in spite of oppression, visiting the log in the Arctic that Fridtjof Nansen slept under in the winter of 1895-6, and why determination is better than inspiration.  
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#CatsOfMastodon #Caturday

Danie (@danie10@squeet.me) wrote:

n

Build with 

Author Name: Reclaim Hosting  
Author ID: reclaimhosting@reclaim.rocks  
Feed: reclaimhosting@reclaim.rocks  
URL: <https://reclaim.rocks/@reclaimhosting/113867176472151583>  
Title: Mastodon  
Created At: 2025-01-21T16:00:26.000Z  
ID: 113867176669689177

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Save As

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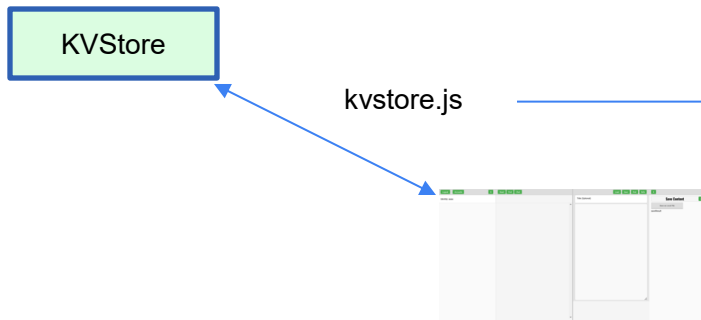
Bluesky

Half an Hour

Published

saveResult

# Identity Server and Accounts



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

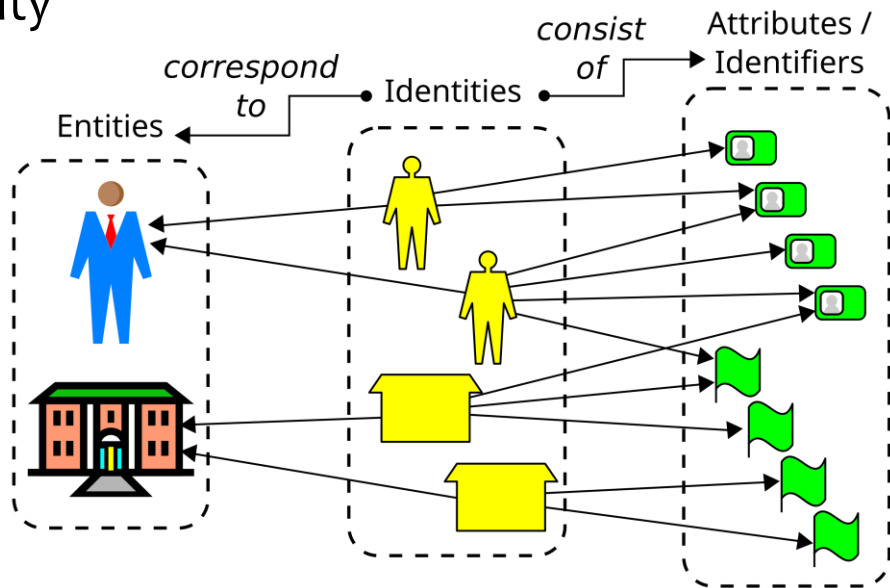
- OAuth2 <https://auth0.com/intro-to-iam/what-is-oauth-2>
- OIDC <https://openid.net/developers/how-connect-works/>
- Self-Sovereign Identity  
[https://en.wikipedia.org/wiki/Self-sovereign\\_identity](https://en.wikipedia.org/wiki/Self-sovereign_identity)

## Key-Value Stores

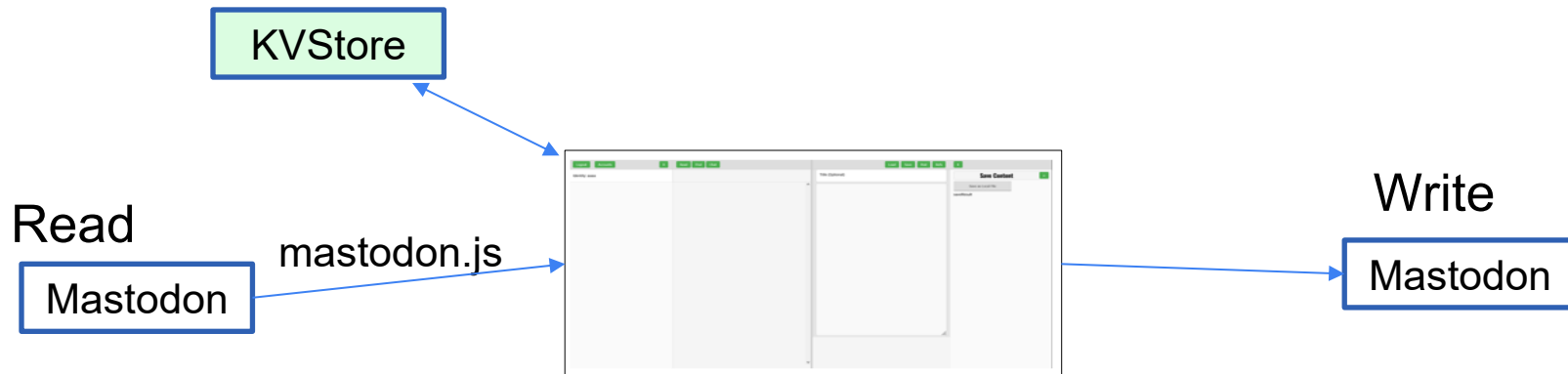
- Cloud, e.g. Vault
- Host, e.g. 1Password

Dock. Decentralized Identity: The Ultimate Guide.

<https://www.dock.io/post/decentralized-identity>



# Mastodon



<https://mastodon.social>

<https://softwaremill.com/the-architecture-of-mastodon/> - architecture

<https://joinmastodon.org/servers> - about Mastodon instances

<https://instances.social/> - select an instance

# Mastodon

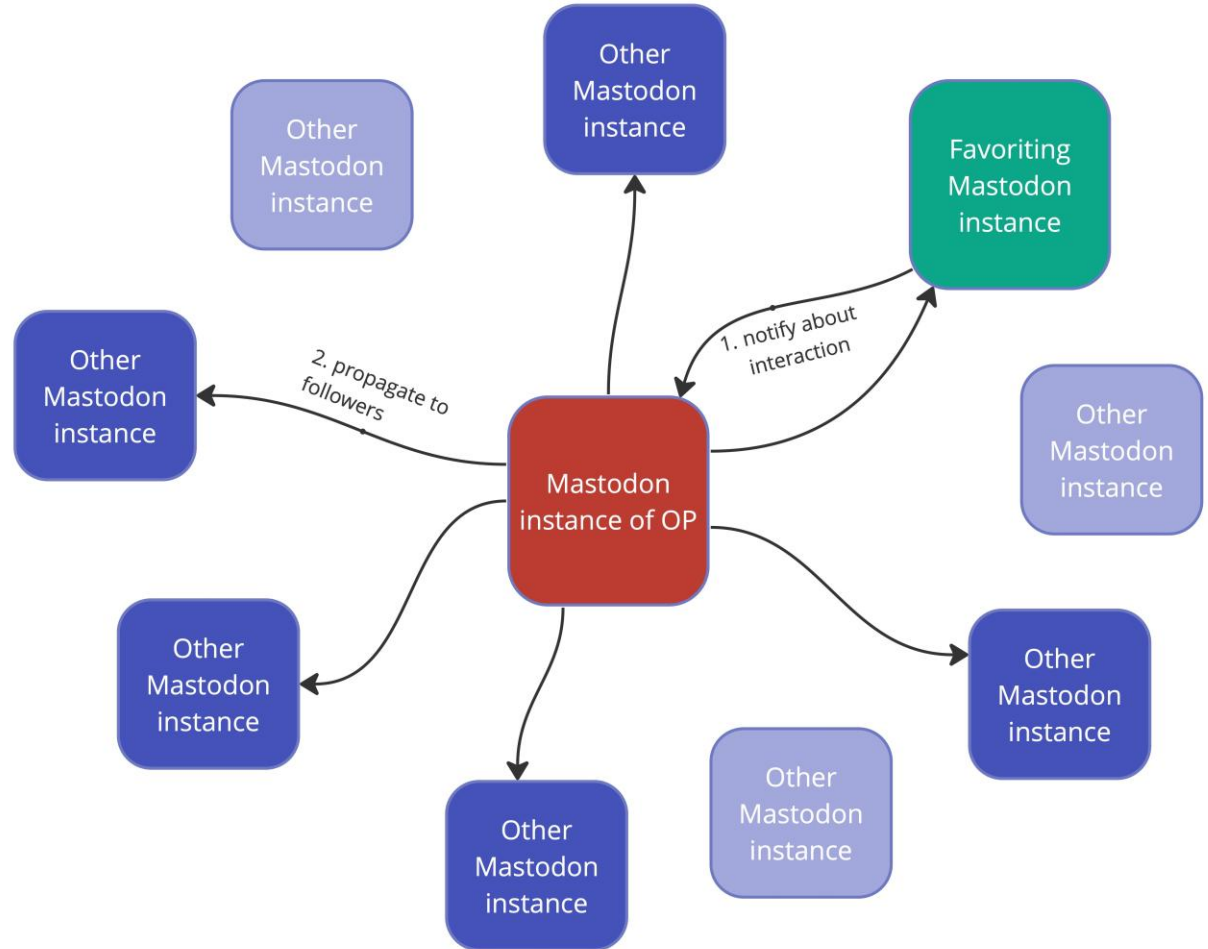
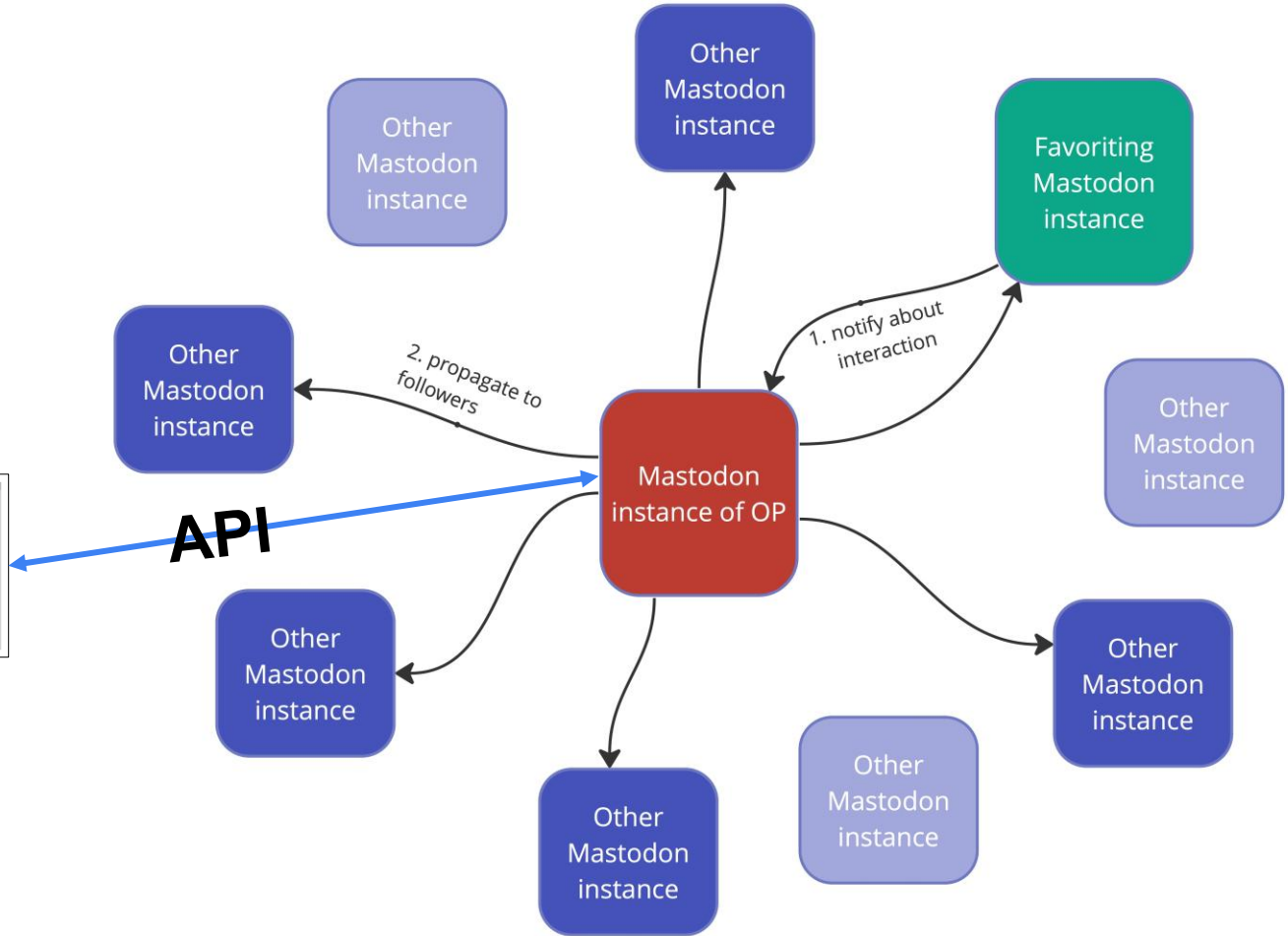
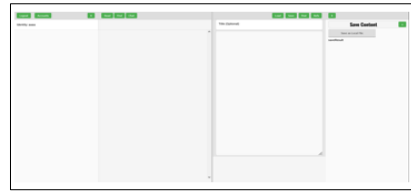


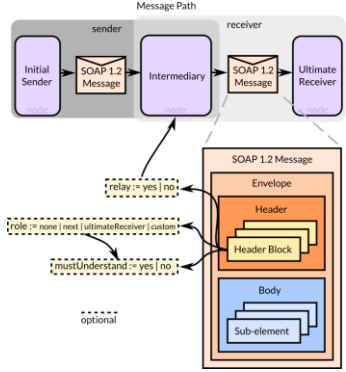
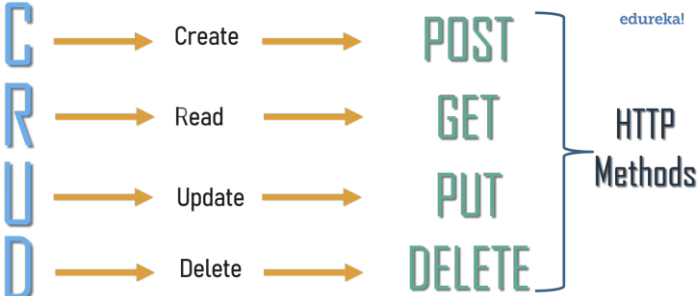
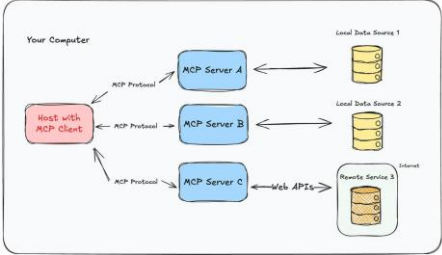
Image:

<https://softwaremill.com/the-architecture-of-mastodon/>

# Mastodon

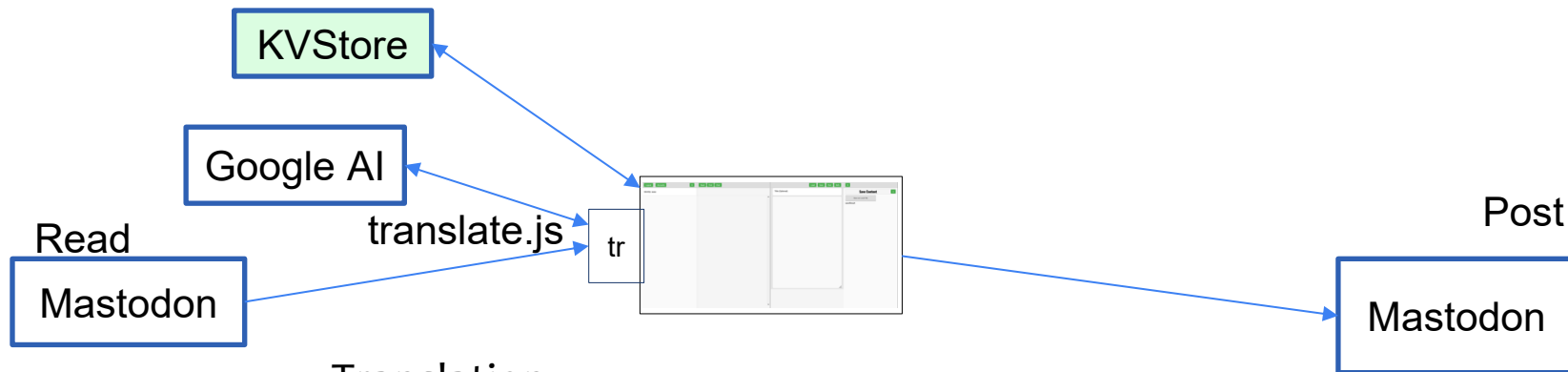


# Three Generations of APIs

SOAP	REST	MCP
<p><a href="https://garba.org/article/general/soa/soap.html">https://garba.org/article/general/soa/soap.html</a></p>  <p>The diagram illustrates the SOAP 1.2 message path and structure. The message path shows an Initial Sender sending a SOAP 1.2 Message to an Intermediary, which then forwards it to an Ultimate Receiver. The SOAP 1.2 Message structure consists of an Envelope containing a Header and a Body. The Header contains one or more Header Blocks. The Body contains one or more Sub-elements. The diagram also shows optional features like 'role' and 'mustUnderstand' attributes.</p>	<p><a href="https://www.edureka.co/blog/what-is-rest-api/">https://www.edureka.co/blog/what-is-rest-api/</a></p>  <p>The diagram shows the REST API CRUD operations. On the left, the letters 'C', 'R', 'U', and 'D' are stacked vertically. Arrows point from each letter to a corresponding HTTP method: 'C' to 'POST', 'R' to 'GET', 'U' to 'PUT', and 'D' to 'DELETE'. A bracket on the right groups these methods under the label 'HTTP Methods'. The 'edureka!' logo is visible in the top right corner.</p>	<p><a href="https://medium.com/@elisows/mcp-explained-the-new-standard-connecting-ai-to-everything-79c5a1c98288">https://medium.com/@elisows/mcp-explained-the-new-standard-connecting-ai-to-everything-79c5a1c98288</a></p>  <p>The diagram illustrates the MCP (Model Context Protocol) architecture. It shows a 'Your Computer' box containing a 'Host with MCP Client'. This host connects to three 'MCP Servers' (A, B, and C) via the 'MCP Protocol'. Each MCP Server is connected to a 'Local Data Source' (1, 2, and 3) via the 'Web API'. The data sources are represented by database icons. The entire system is connected to the 'Internet'.</p>

# Auto-Translation

And Auto-Accessibility...?



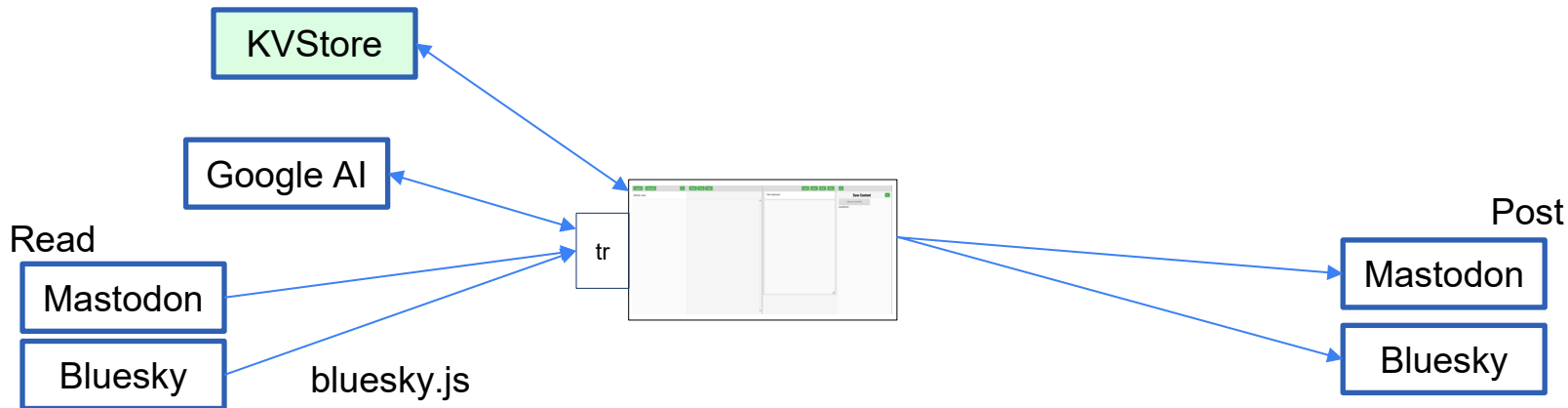
## Translation

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

<https://cloud.google.com/translate>



# 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

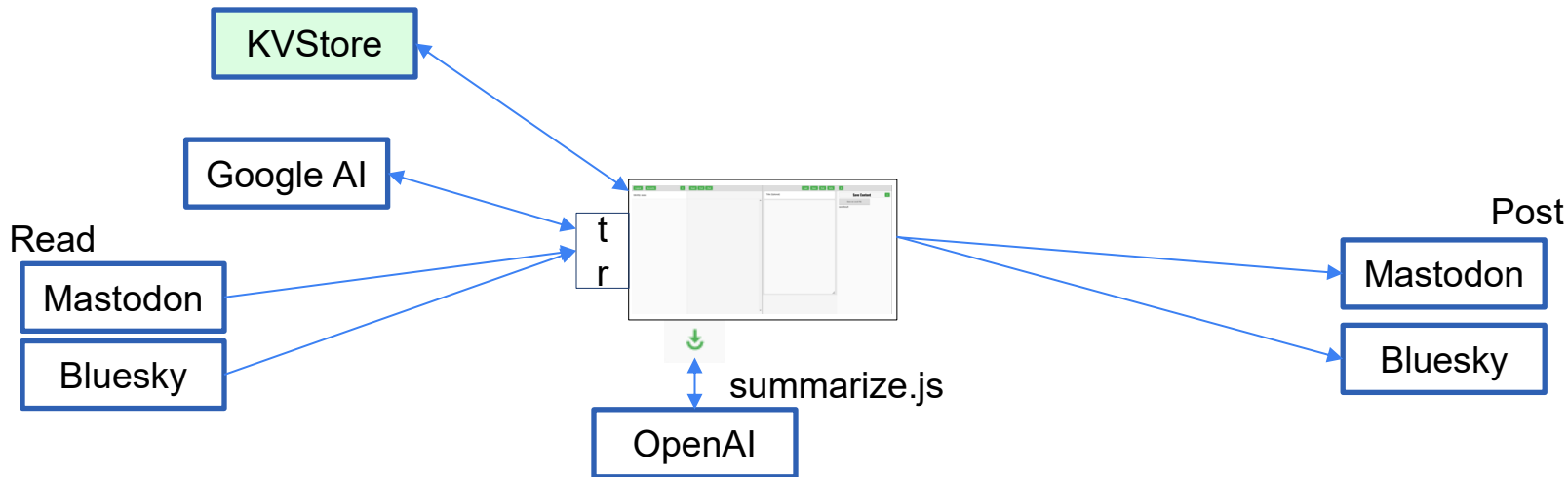
[Post](#) [Timeline](#) [Favorites](#) [Pinned](#) [Recommended](#) [What's Hot](#) [Search](#)

[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

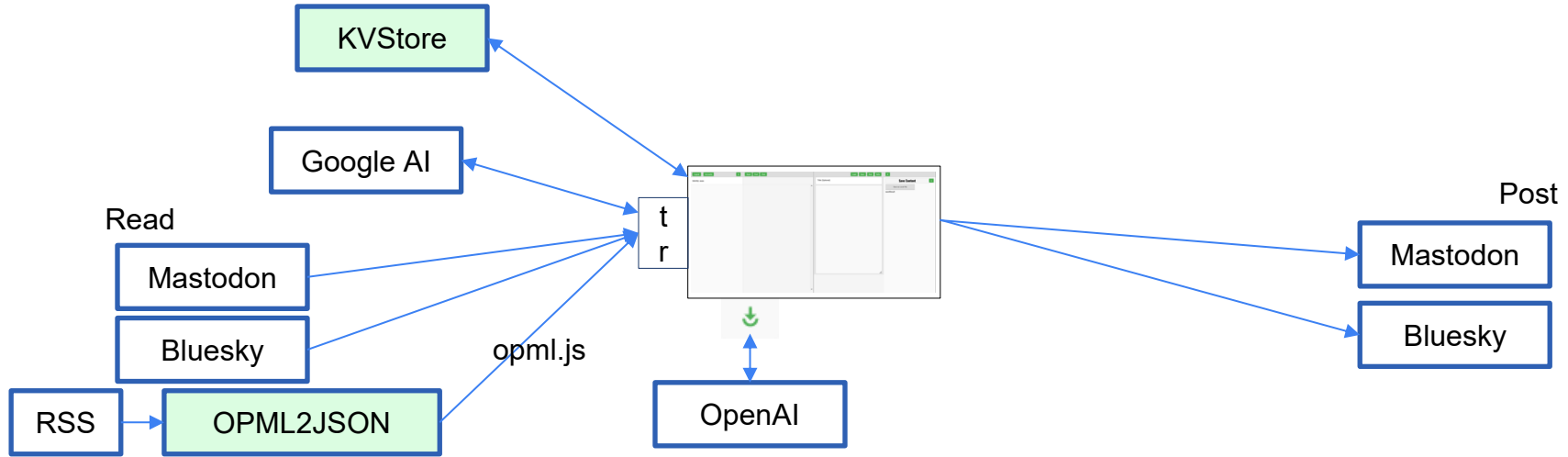
# Thread Summary



## Thread Summarizer

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

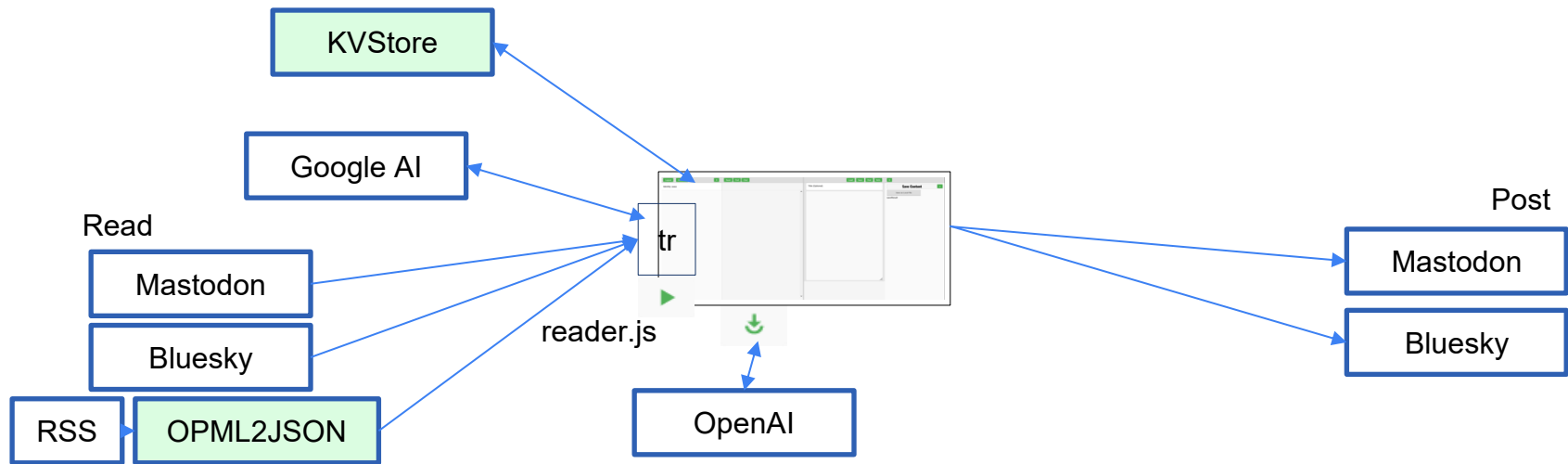
# Content Feeds: OPML and RSS



## Retrieving and Reading RSS

- Standalone <https://opml2json.downes.ca> deployed
- OPML URLs are entered as accounts

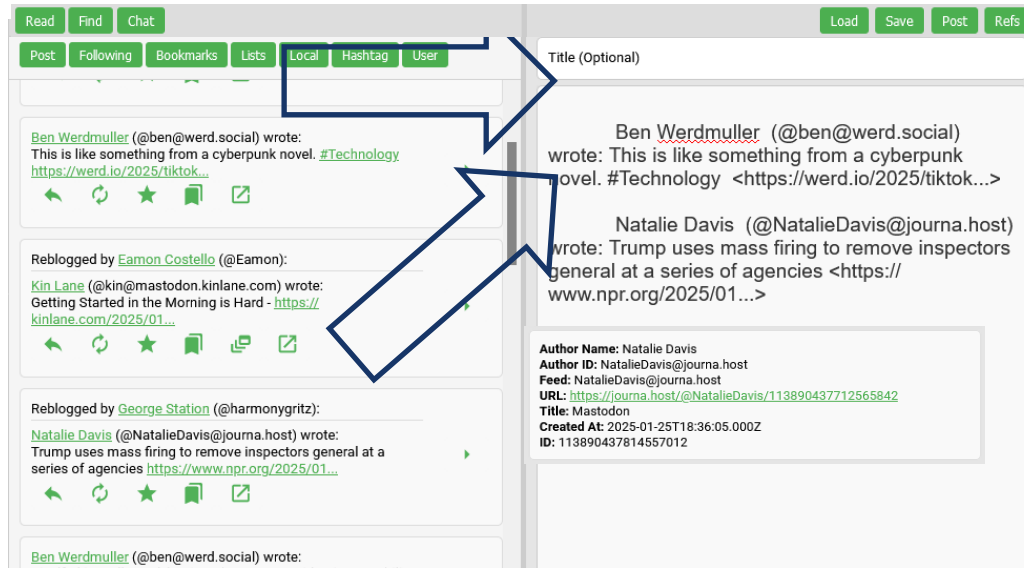
# Audio Content: Podcast Player



## Create and Play Podcast List

- RSS reader detects audio enclosures in feed
- Builds playlist in audio player

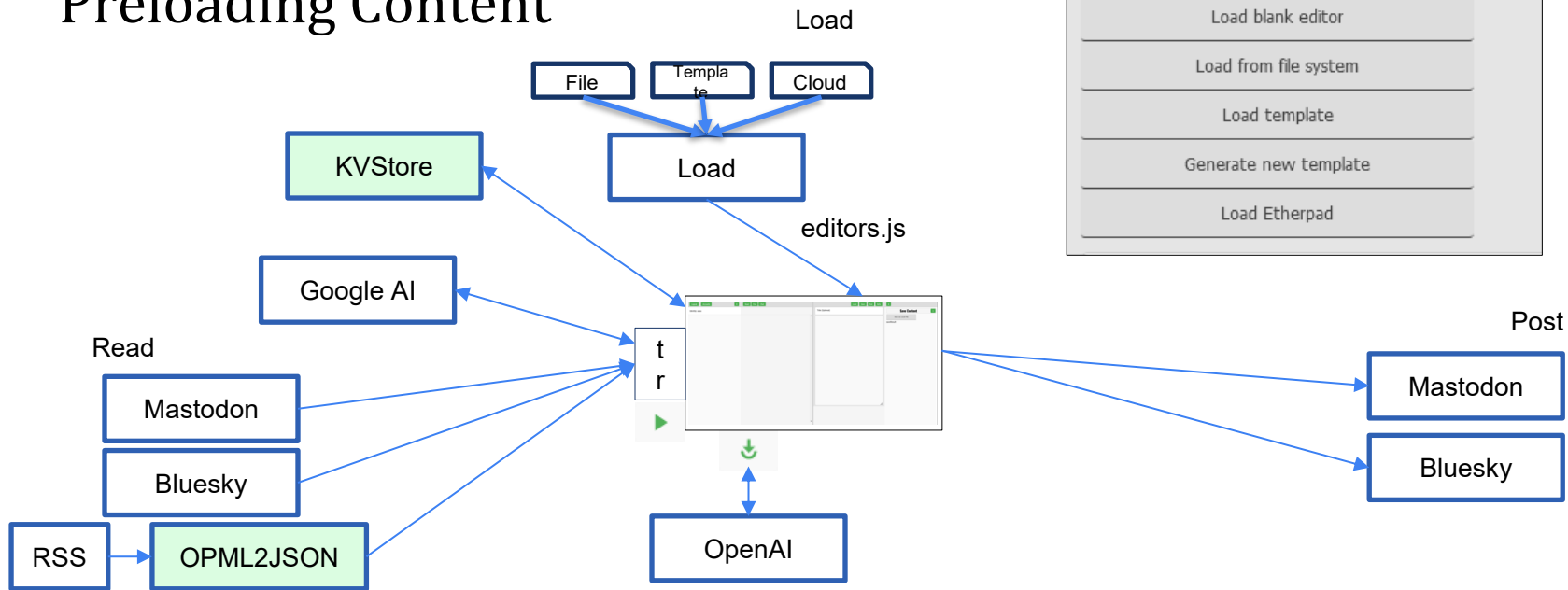
# Convergence



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

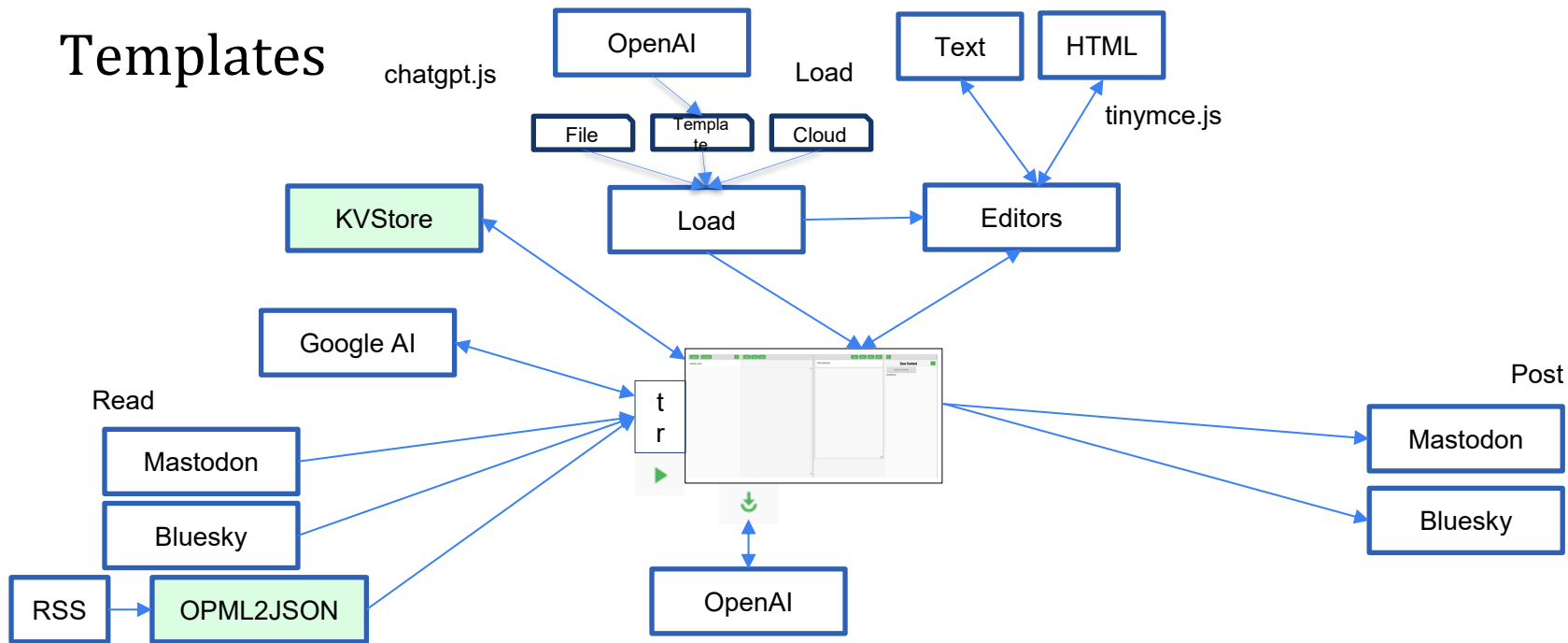


## Loading Content

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



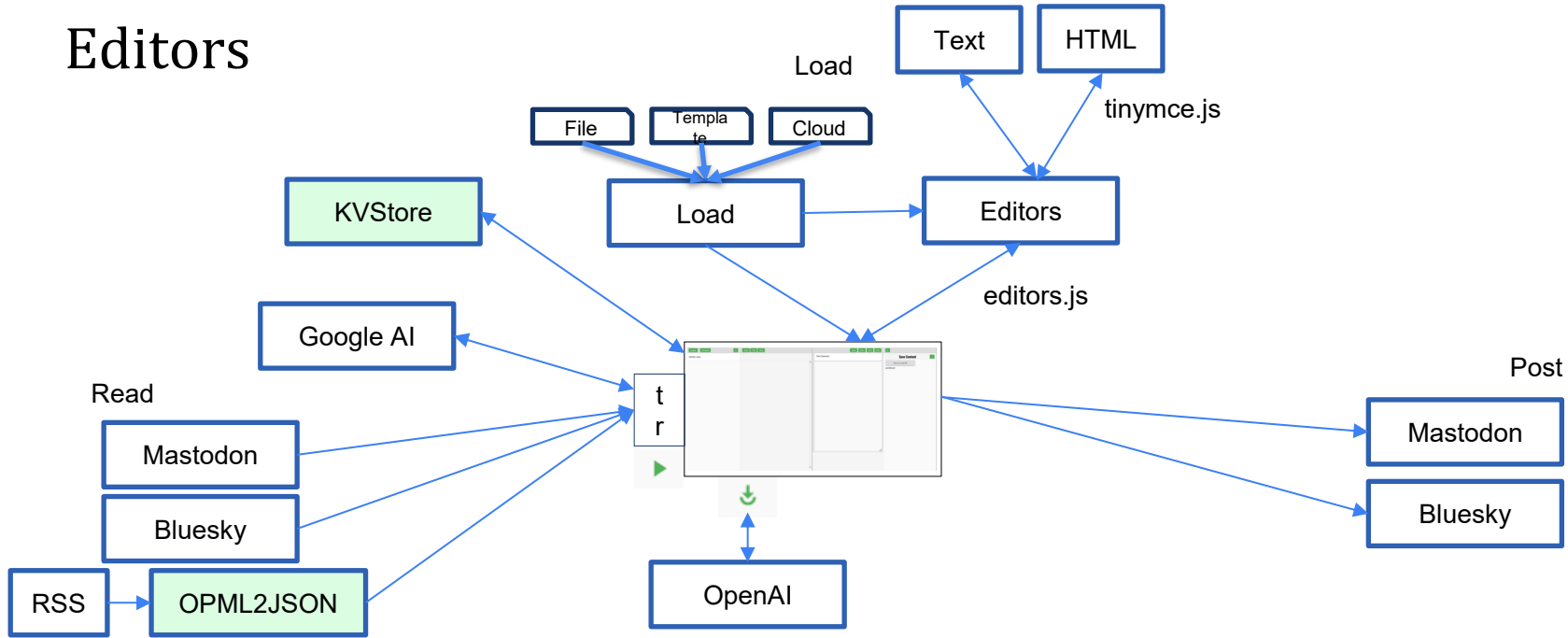
# Templates



## 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

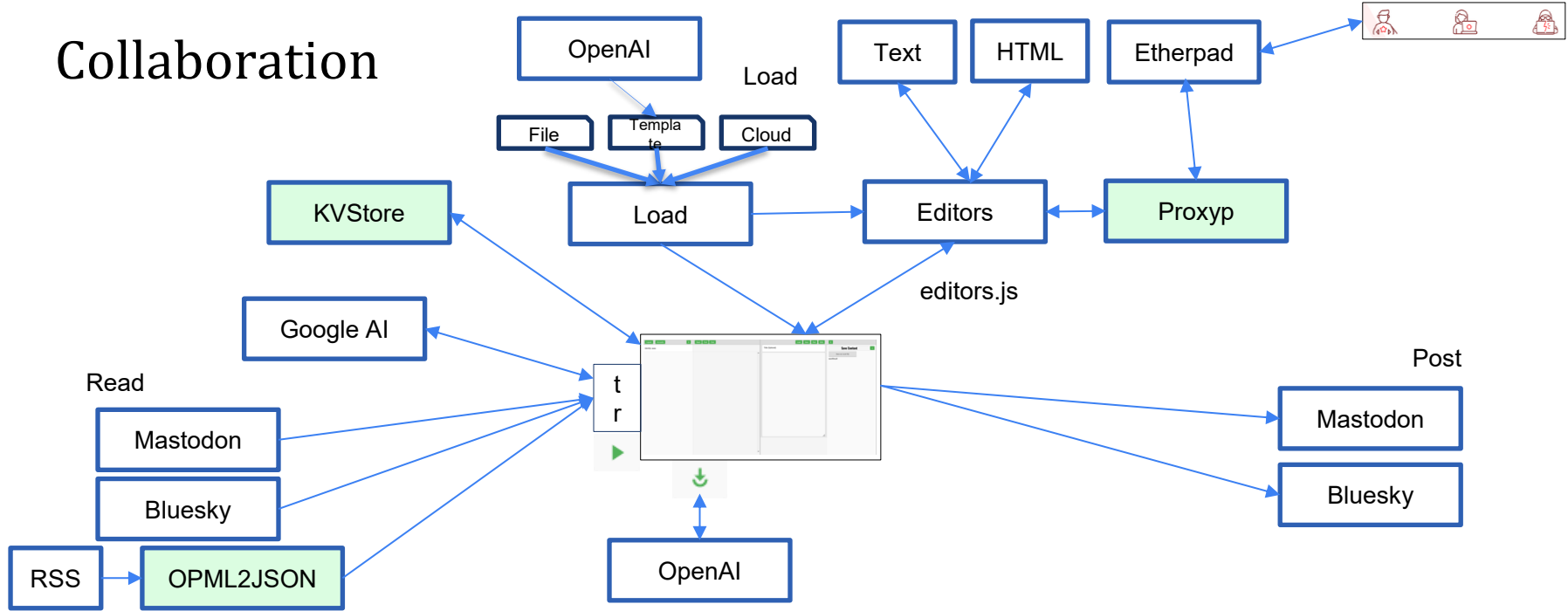
```
98
99  //link copy
100
101  var $temp = $("<input>");
102  var $url = $(location).attr('href');
103
104  $('.play_all').on('click', function() {
105      $("body").append($temp);
106      $temp.val($url).select();
107      document.execCommand("copy");
108      $temp.remove();
109      $("copyUrl").text("URL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




## Collaborative Editing

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

# The OPTIONS Conundrum

## ◆ AI Overview

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

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

```
✖ Access to XMLHttpRequest at 'http://localhost:1t: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 Error
    at createError (createError.js:16)
    at XMLHttpRequest.handleError (xhr.js:87)
```

# Chat and Share

```
graph TD
    subgraph Read
        RSS[RSS] --> OPML2JSON[OPML2JSON]
        OPML2JSON --> tr
        Mastodon[Mastodon] --> tr
        Bluesky[Bluesky] --> tr
    end
    subgraph Post
        tr --> Mastodon2[Mastodon]
        tr --> Bluesky2[Bluesky]
    end
    subgraph Chat_and_Share
        dynamicp2pjs[dynamicp2p.js] --> KVStore[KVStore]
        peerjsjs[peerjs.js] --> KVStore
        KVStore <--> Chat[Chat]
        Chat <--> tr
    end
    subgraph Load_and_Editors
        File[File] --> Load[Load]
        Template[Template] --> Load
        Cloud[Cloud] --> Load
        Load --> tr
        Text[Text] --> Editors[Editors]
        HTML[HTML] --> Editors
        Etherpad[Etherpad] --> Editors
        Editors <--> Proxyp[Proxyp]
        Editors --> tr
    end
    OpenAI1[OpenAI] --> Load
    OpenAI1 --> Editors
    OpenAI1 <--> tr
```

The diagram illustrates a system architecture for "Chat and Share". It features a central component labeled "tr" (a terminal window) which acts as a hub. The system is divided into several functional areas:

- Read:** Sources of content including RSS, OPML2JSON, Mastodon, and Bluesky feed into the central "tr" component.
- Post:** The central "tr" component feeds into Mastodon and Bluesky for posting content.
- Chat and Share:** This section includes "dynamicp2p.js" and "peerjs.js" which connect to a "KVStore". The "KVStore" is linked to a "Chat" component, which in turn connects to the central "tr".
- Load and Editors:** The "Load" component (receiving input from "File", "Template", and "Cloud") and the "Editors" component (receiving input from "Text", "HTML", and "Etherpad") both feed into the central "tr". The "Editors" component is also connected to a "Proxyp" component.
- OpenAI:** An "OpenAI" component is connected to "Load", "Editors", and the central "tr".

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

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# Discovery and Indexing

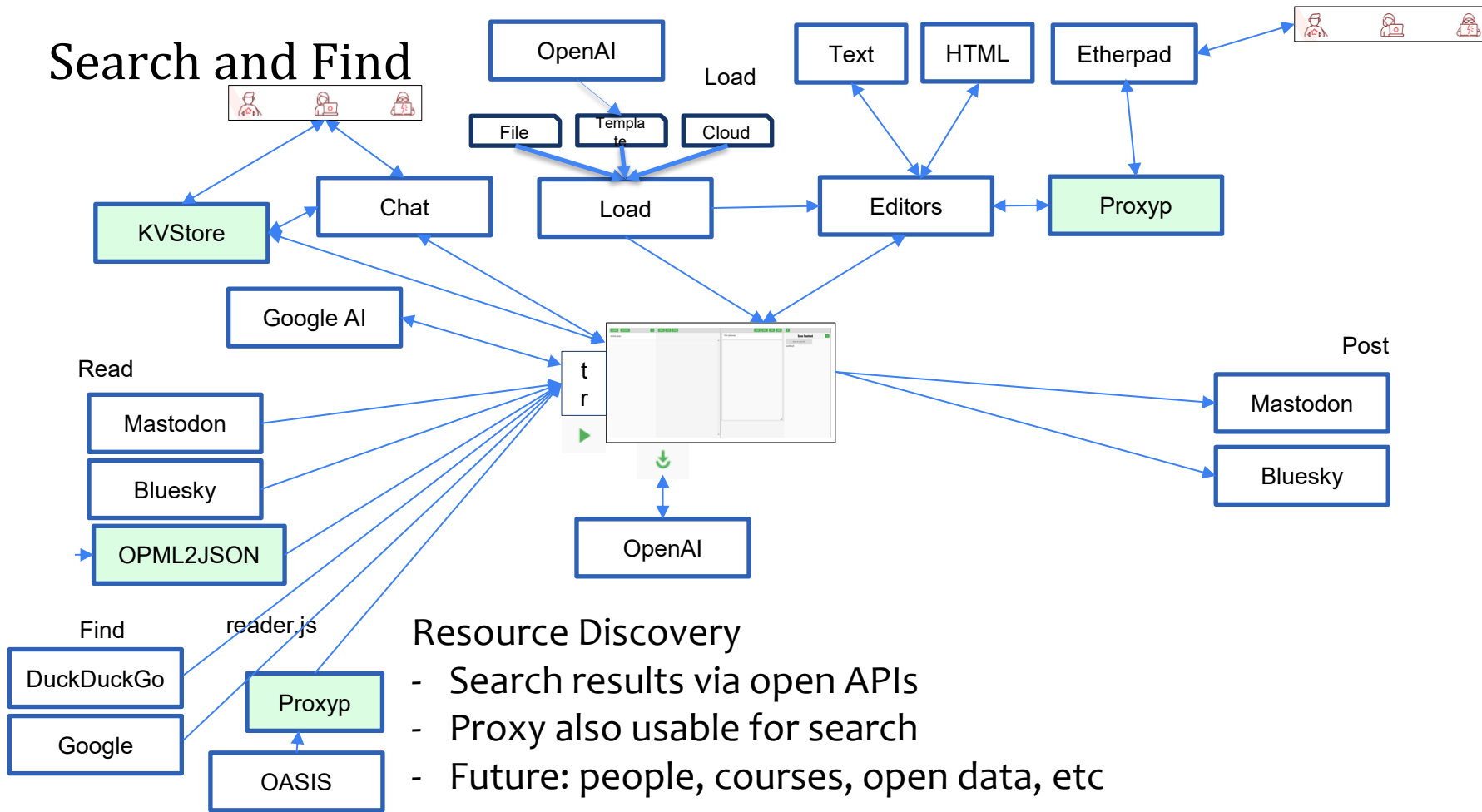
Decentralized discovery and indexing already exists:

- Telephone directory services
- DNS

Blockchain-style decentralized consensus

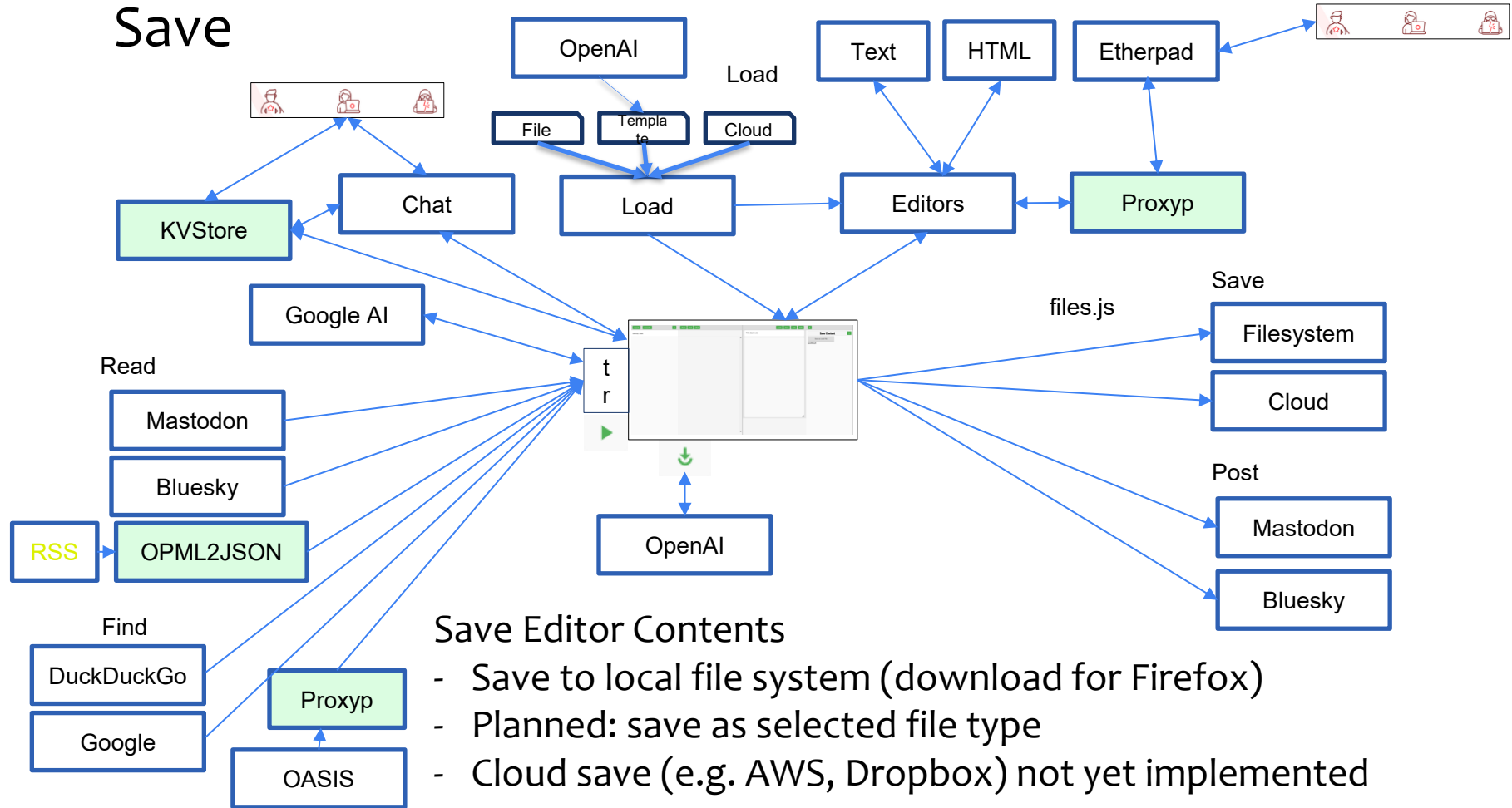
- Byzantine Generals Problem

# Search and Find

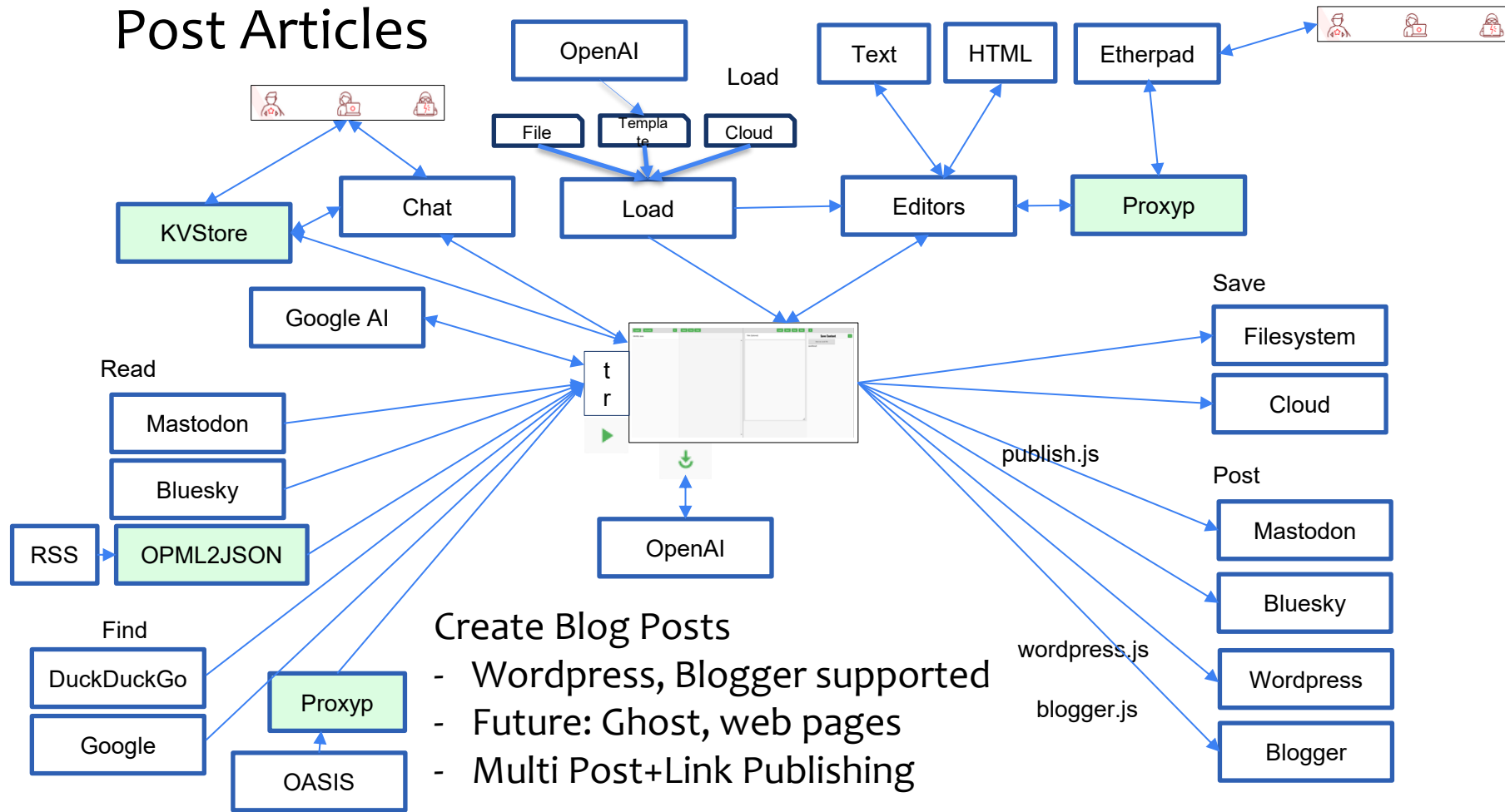




# Save



# Post Articles



# The Future...?

