

Link to show off product video

<https://youtu.be/PD1dJui0NlI?si=0oSETLhCx7uLC2qA>

Live demo was done in class so check podcast

Social Media Visualizer

A technical presentation by Thomas-Driven Developers

Contents

- 1. Project Overview**
- 2. Design**
- 3. Processes**
- 4. Architecture & Systems**
- 5. Limitation / Future Work**
- 6. Lesson Learned**

01

Project Overview

Current State of Social Media

- They are centralized
- Suppression of free speech
- Selling data to other parties
- Lack of Privacy
- Targeted advertisements



Mastodon

- Decentralized Social Media
- Open source and P2P
- No advertisements
- Robust privacy settings

BUT

- Immature UI/UX
- Less user reach



Statement of Purpose

We aim to help users explore the giant space of the Fediverse network, empowering them to view their local network in a user-friendly interface - and potentially help the users expand and shape their own local network.

**"The greatest value of a
picture is when it forces us to
notice what we never
expected to see."**

—John Tukey

02

UI/UX Design

UI/UX design

- color palette



- user workflow

Welcome to Mastodon Network Visualizer

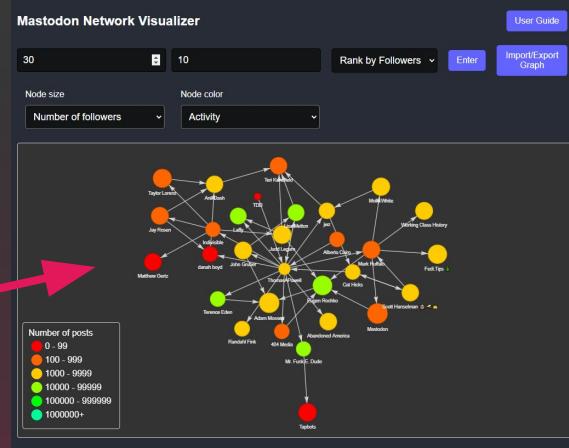
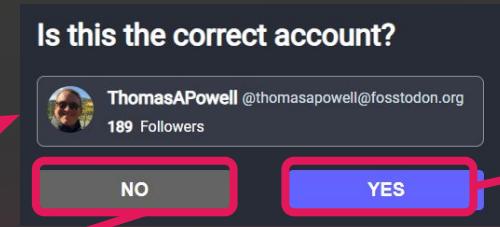
Enter the username and the server domain of a Mastodon account for a social network visualizer customized for your account.

Username
thomasapowell

Server Domain
fosstodon.org

Invalid username/server domain?

SUBMIT



- Why Submit and Confirm? - Prevention of error

UI/UX Design decisions

- Invalid Input (pre-processing before api fetch)



- Account search result display

Welcome to Mastodon Network Visualizer
Enter the username and the server domain of a Mastodon account for a social network visualizer customized for your account.

Username: e.g. joe123

Server Domain: e.g. mastodon.social

Invalid username/server domain?

[Don't have an account? Sign up](#)

Welcome to Mastodon Network Visualizer
Enter the username and the server domain of a Mastodon account for a social network visualizer customized for your account.

Username: thomasapowell

Server Domain: fosstodon.org

Invalid username/server domain?

[Don't have an account? Sign up](#)

Is this the correct account?

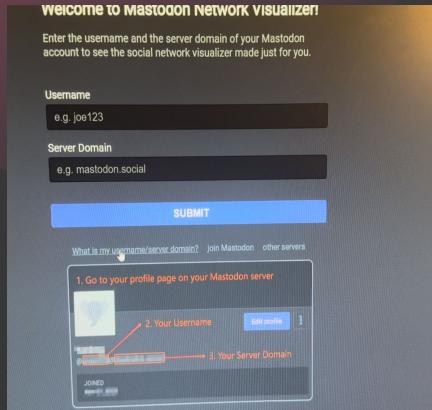
ThomasAPowell @thomasapowell@fosstodon.org
189 Followers

single page

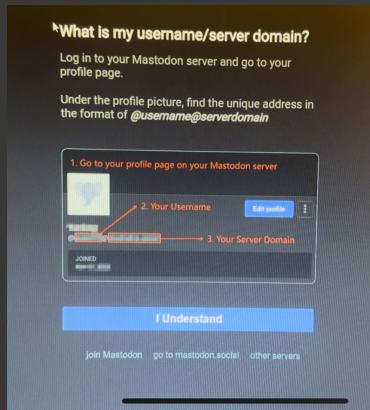
separate pages

UI/UX Design Decisions

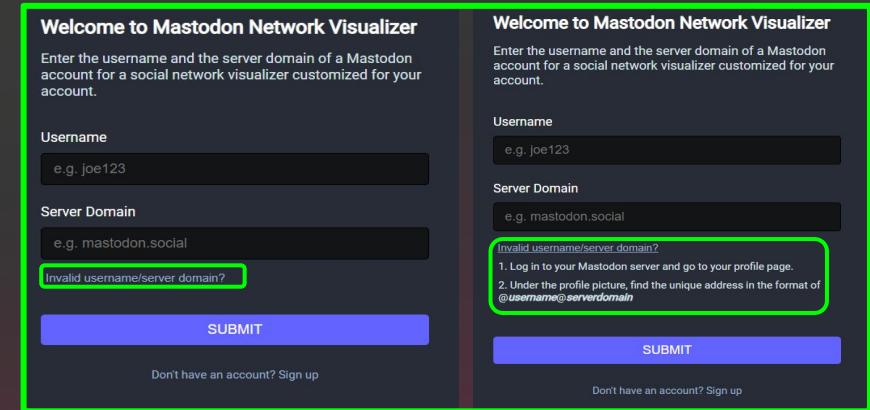
- Input page instructions UI decisions



display instruction image when hovering



a separate instruction page by clicking on the link

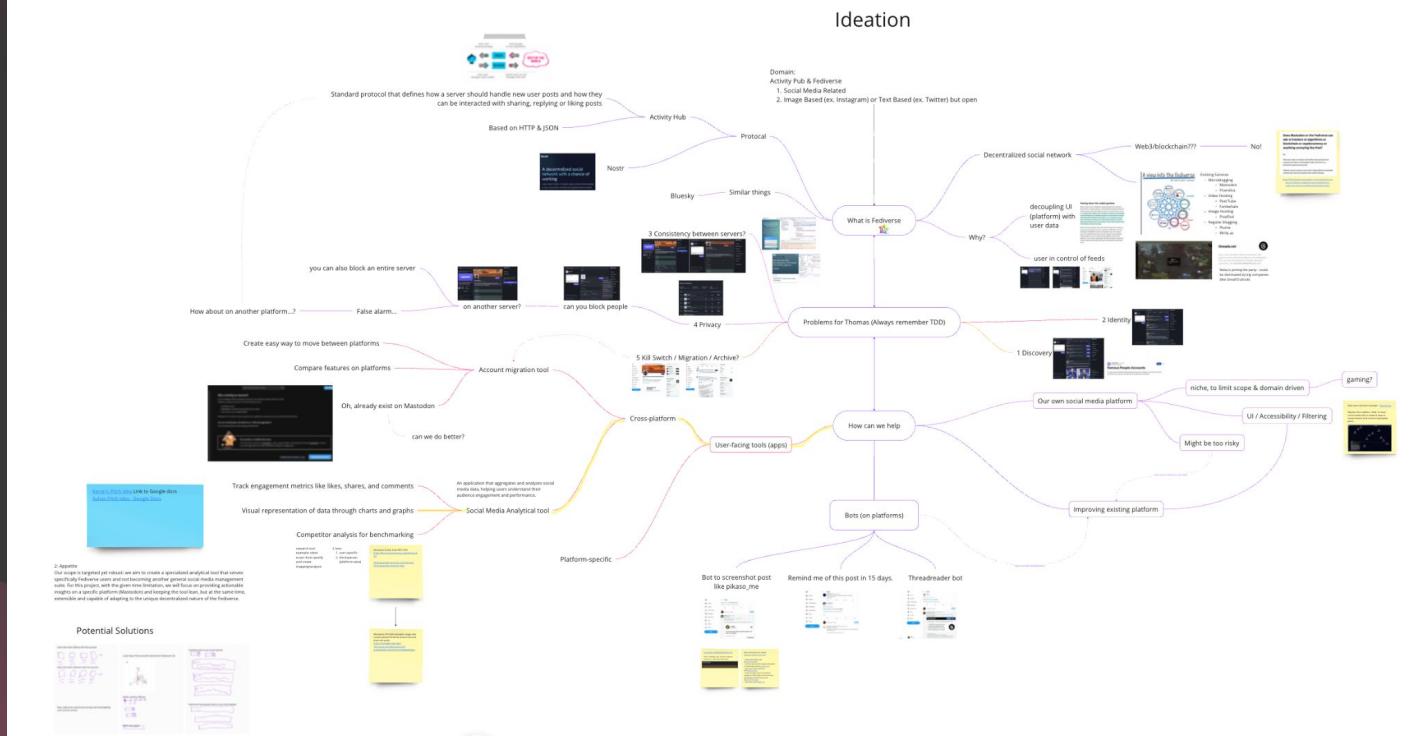


remove the instruction image and make it an expandable link on the same page

03

Processes

Ideation - Miro



Story/Task Board

Story Board

Board | PRs | Roadmap | + New view

-status:"Open PR","Merged PR"

29 | Discard | Save

Bug Fixes 5

- 210-Team4-TDD #33
BUG: Script for Prettier and Start Node not Working for Windows
#34
- 210-Team4-TDD #38
BUG: Handle api axios timeouts
- 210-Team4-TDD #51
BUG: Lookup Service Using Original Server Instead of mastodon.social
- 210-Team4-TDD #53
BUG: Null Pointer Error when No Following

+ Add item

Completed Stories 5

This has been completed

- 210-Team4-TDD #11
STORY: Basic User Input Workflow
#55
- 210-Team4-TDD #4
STORY: Basic Network Visualization
- 210-Team4-TDD #24
STORY: Node Style - Size and Color (w/ control)
- 210-Team4-TDD #15
STORY: Node Number Limit & Ranking w/

+ Add item

Completed Tasks 18

- 210-Team4-TDD #37
DOCS: Admin folder setup
#43
- 210-Team4-TDD #17
TASK: Max Node Number & Locality (Client)
- 210-Team4-TDD #19
TASK: Node Selection - Ranking (Client)
- 210-Team4-TDD #25
TASK: Node Style Control: Size & Color (Client)

+ Add item

Admin Tasks 1

- 210-Team4-TDD #36
Final Presentation

+ Add item

User Stories

Story Board

Board PRs Issues

-status:"Open PR","Merged PR"

Bug Fixes 5

210-Team4-TDD #33
UG: Script for Prettier and Start Node n
Working for Windows
#34

210-Team4-TDD #38
UG: Handle api axios timeouts

210-Team4-TDD #51
UG: Lookup Service Using Original Serv
instead of mastodon.social

210-Team4-TDD #53
UG: Null Pointer Error when No Followin
xist
#54

210-Team4-TDD #39
UG: Gun database Delayed Response E
#42

Add item

210-Team4-TDD #11

STORY: Basic User Input Workflow #11

Closed alexluo1998 opened 2 weeks ago

 alexluo1998 now (edited)

As a user of the visualization tool, I want to input my account name and Mastodon server domain through a user-friendly interface, so that the system can use these details to retrieve my local network data

[TASK: Basic User Input Workflow \(Client\) #14](#)
 [TASK: Basic User Input Workflow \(Server\) #13](#)



Write Preview

Leave a comment

Paste, drop, or click to add files

Reopen Comment

Assignees: yunlongwangsd and devxm

Labels: Add labels...

Milestone: Add milestone...

Status: **Completed Stories**

Linked pull requests: #55

Repository: 210-Team4-TDD

Iteration: Iteration 2

Open in new tab
Copy link
Copy link in project
Archive
Delete from project

Detailed Tasks (Specs)

210-Team4-TDD #16

TASK: Node Number Limitation (Server) #16

Closed

alexluo1998 opened 2 weeks ago



alexluo1998 now (edited)

Edit

- Create a parameter in the "/initialize" endpoint to accept the node limit number.
- Modify the data preparation logic to incorporate the node limit, before serving to client. Consider what type of filtering would be most intuitive to the user (probably BFS) and implement it in a way that will allow specified ranking criteria (ex: some weighted search, where you iteratively travel along the highest ranked edge?) to be added in a future task and will run efficiently enough.
- Unit Tests



Write

Preview

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Leave a comment

Roadmap/Iterations

Story Board

Board | PRs | Roadmap | New view

Filter by keyword or by field

November 2023 December 2023

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Markers Sort Date fields Month Today < >

Save

15 TASK: Basic Visualization (Client) #30

9 TASK: Node Ranking Algorithm (Server) #20

10 TASK: GunDB Integration (Server) #7

11 TASK: Frontend Server #40

12 TASK: VisJS Exploration (Client) #31

13 DEV: Set up Linter and Styler #2

14 DEV: Initial Repo Setup #29

15 TASK: Node Style - Size & Color (Server) #26

16 TASK: Basic Network Visualization (Serv... #6

17 TASK: Basic User Input Workflow (Server) #13

18 TASK: Basic User Input Workflow (Client) #14

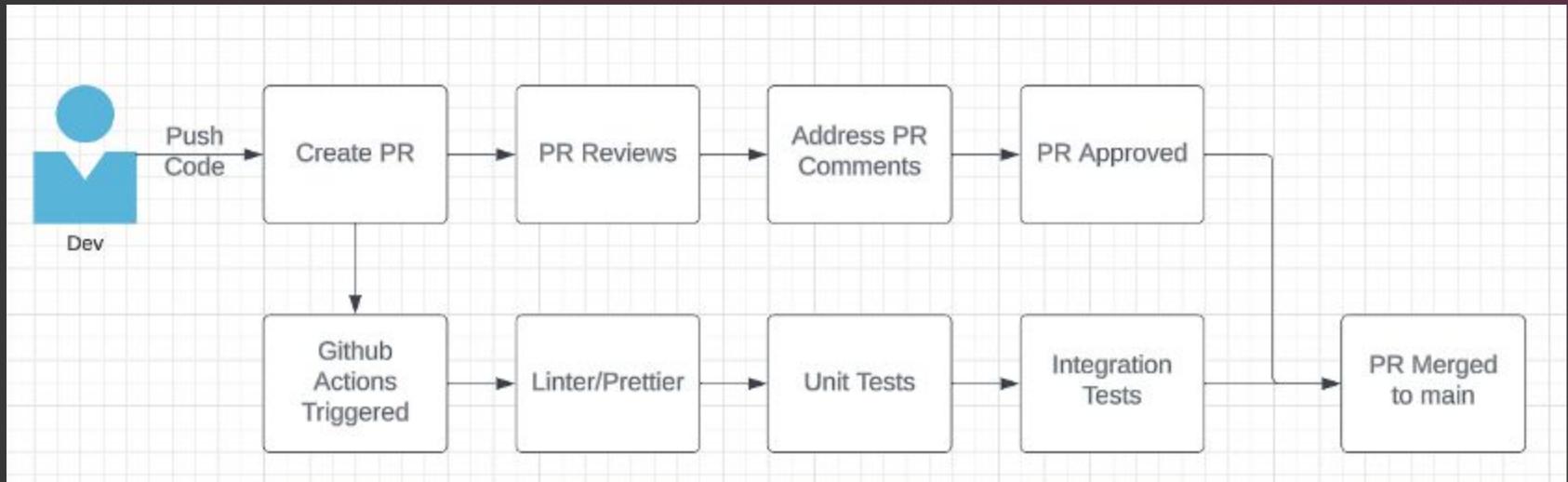
19 TASK: Basic Visualization Page Structure #21

20 STORY: Basic User Input Workflow #11

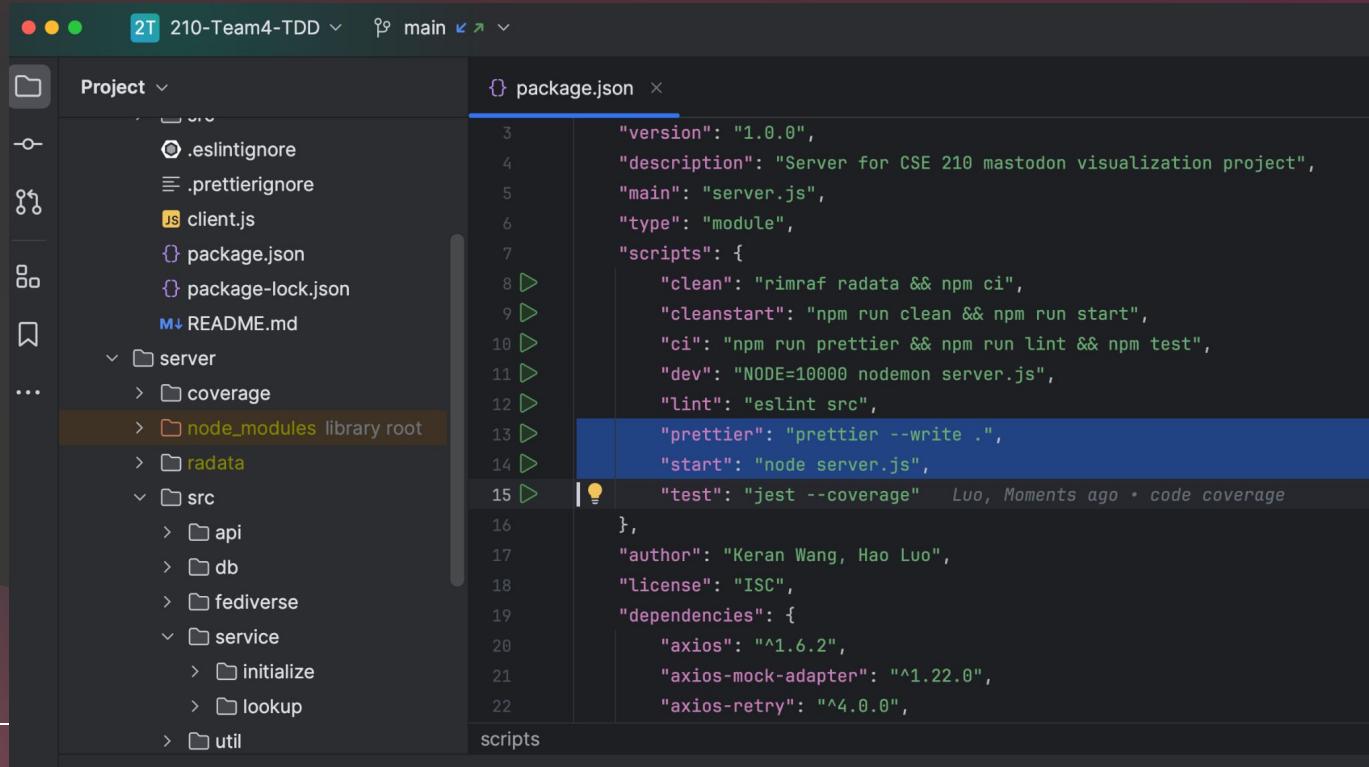
21 STORY: Basic Network Visualization #4

+ You can use Control + Space to add an item

CI Workflow



CI Workflow



A screenshot of a dark-themed code editor (VS Code) showing the project structure and the contents of the `package.json` file.

The project structure on the left includes:

- `.eslintignore`
- `.prettierignore`
- `client.js`
- `package.json`
- `package-lock.json`
- `README.md`
- `server` folder
 - `coverage`
 - `node_modules` (highlighted in yellow)
 - `radata`
- `src` folder
 - `api`
 - `db`
 - `fediverse`
 - `service` folder
 - `initialize`
 - `lookup`
 - `util`

The `package.json` file content is as follows:

```
3 "version": "1.0.0",
4 "description": "Server for CSE 210 mastodon visualization project",
5 "main": "server.js",
6 "type": "module",
7 "scripts": {
8     "clean": "rimraf radata && npm ci",
9     "cleanstart": "npm run clean && npm run start",
10    "ci": "npm run prettier && npm run lint && npm test",
11    "dev": "NODE=10000 nodemon server.js",
12    "lint": "eslint src",
13    "prettier": "prettier --write .",
14    "start": "node server.js",
15    "test": "jest --coverage"   Luo, Moments ago • code coverage
16 },
17 "author": "Keran Wang, Hao Luo",
18 "license": "ISC",
19 "dependencies": {
20     "axios": "^1.6.2",
21     "axios-mock-adapter": "^1.22.0",
22     "axios-retry": "^4.0.0",
```

Old School PR

Augment Initialize Endpoint #48

Merged Untellable merged 22 commits into main from backend/augment-initialize 3 days ago

Conversation 6 Commits 22 Checks 4 Files changed 7

+227 -136

Untellable commented 3 days ago

Augment initialize endpoint to include max nodes, node ranking, and locality parameters to allow better control over node selection.

I haven't had time to unit test yet, though @Kitwadr has visualized a few of the results and they look correct.

Note that some connections between nodes may be missing due to mastodon pagination only returning a random subset of relationships, though the result should always form a fully connected graph.

Untellable requested review from alexluo1998, Kitwadr, ggopalai, omkarbhope, yunlongwangsd, devxm and flacipalm 3 days ago

Untellable force-pushed the backend/augment-initialize branch from fe1cff5 to 3721911 3 days ago

alexluo1998 previously approved these changes 3 days ago

alexluo1998 left a comment

some minor style comments

server/src/service/initialize/initialize-service.js

```
126 + const nodeHeap = new Heap(heapComparator);
127 + nodeHeap.init([accountInfoMap.get(mainId)]);
128 +
129 + let rankFun; // Choose parameter to rank nodes by
```

alexluo1998 3 days ago

I would probably extract this (and even including the calcPriority) into a separate function - cleaner and easier to test (maybe you are already doing it)

Reviewers

- keran-w
- yunlongwangsd
- alexluo1998
- Kitwadr
- ggopalai
- omkarbhope
- devxm
- flacipalm

Assignees

No one—assign yourself

Labels

None yet

Projects

Story Board

Status: Merged PR +1 more

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

Notifications

Customize

Github Actions

The screenshot shows a GitHub commit history for a repository. At the top, a commit by **Untellable** is shown, adding four commits 3 days ago:

- Fix error on query params missing (3bb133c)
- Adjust unit tests for new format and make camelcase variable names co... (5d88872)
- run prettier (473b3aa)
- Condense unused node removal code. (dd790ce)

Below this, **Untellable** force-pushed the `backend/augment-initialize` branch from `d9a0a42` to `dd790ce` 3 days ago. There is a link to [Compare](#).

Following the merge, **yunlongwangsd** approved these changes 3 days ago. There is a link to [View reviewed changes](#).

Then, **keran-w** self-requested a review 3 days ago.

Next, **keran-w** approved these changes 3 days ago. There is a link to [View reviewed changes](#).

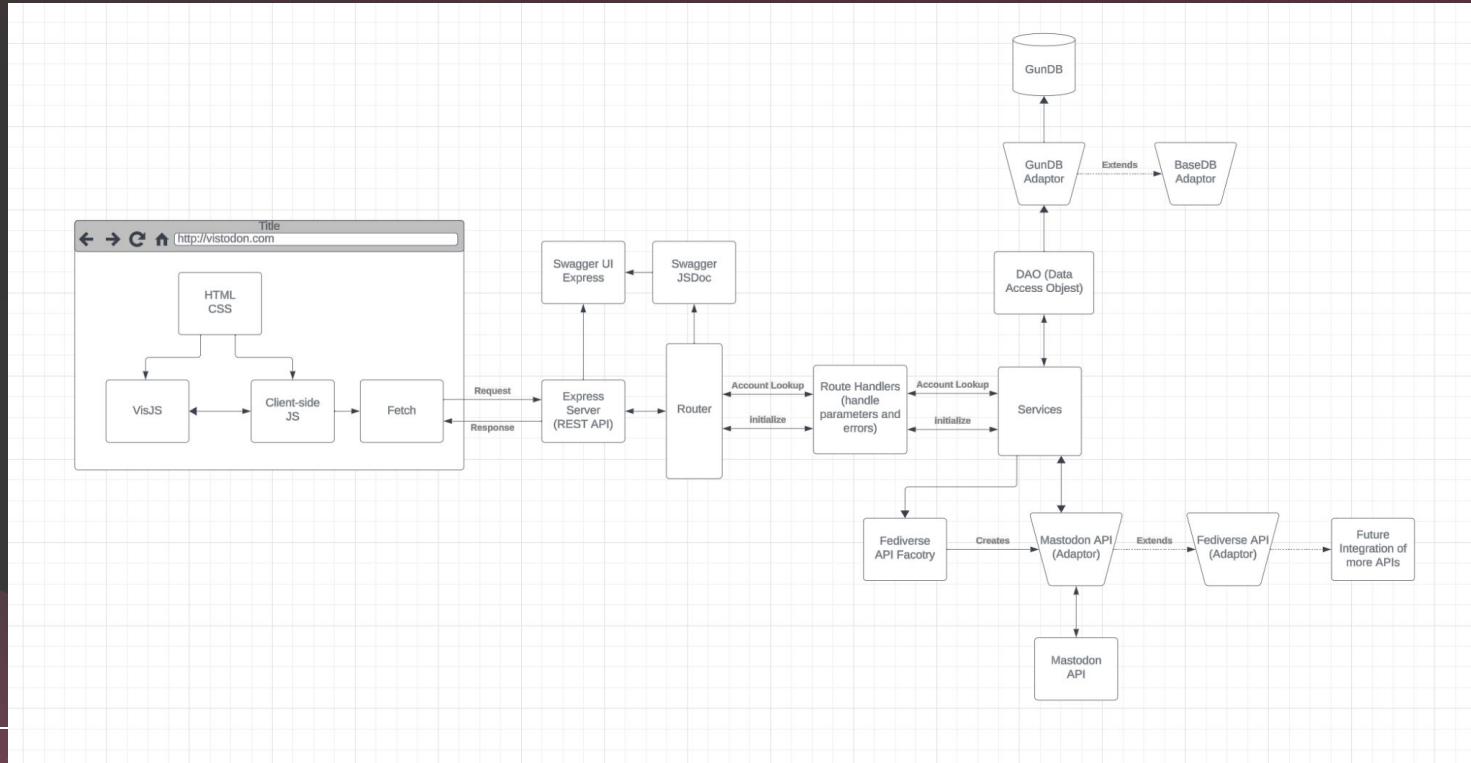
Finally, **Untellable** merged commit `7c7b4bf` into `main` 3 days ago. A modal window shows the results of 4 checks:

- client-lint (Details)
- client-tests (Details)
- server-lint (Details)
- server-tests (Details)

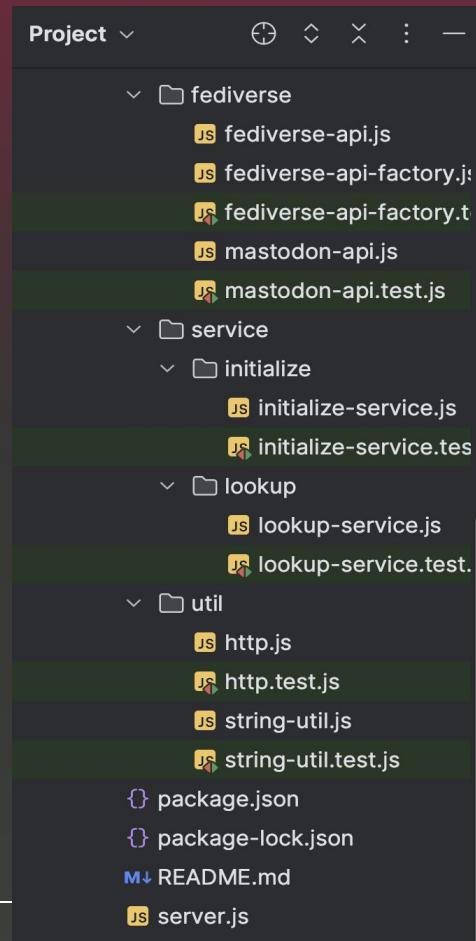
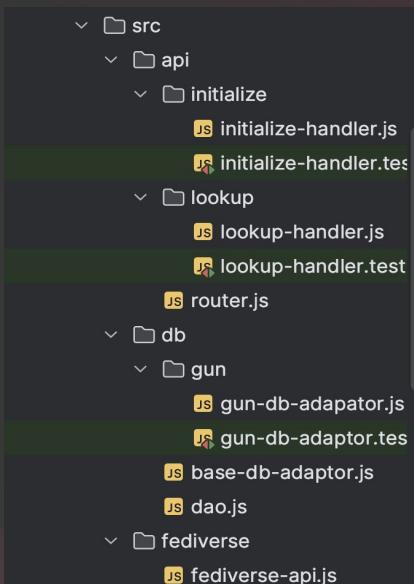
At the bottom, **Untellable** deleted the `backend/augment-initialize` branch 3 days ago. There is a link to [Restore branch](#).

The interface includes a "Add a comment" section with a placeholder "Add your comment here..." and a rich text editor toolbar below it.

Architecture Diagram - Lucid



Unit Testing



Test Coverage

File	% Stmt	% Branch	% Func	% Lines	Uncovered Line #s
All files	53.12	47.82	54.54	52.97	
api/initialize	100	100	100	100	
initialize-handler.js	100	100	100	100	
api/lookup	100	100	100	100	
lookup-handler.js	100	100	100	100	
db	22.22	50	14.28	22.22	
base-db-adaptor.js	22.22	50	14.28	22.22	16,33-97
db/gun	50	33.33	54.54	50	
gun-db-adapator.js	50	33.33	54.54	50	80-147
fediverse	62.96	100	60	62.96	
fediverse-api-factory.js	100	100	100	100	
fediverse-api.js	20	100	20	20	27-63
mastodon-api.js	71.42	100	100	71.42	46-47,67-68,89-90
service/initialize	31.25	28.57	54.54	28.76	
initialize-service.js	31.25	28.57	54.54	28.76	30,52,83-182,190,192
service/lookup	100	100	100	100	
lookup-service.js	100	100	100	100	
util	75	45.45	100	75	
http.js	55.55	14.28	100	55.55	19-27
string-util.js	100	100	100	100	

```
Test Suites: 9 passed, 9 total
Tests:      32 passed, 32 total
Snapshots:  0 total
```

jest --coverage

Easy Run Instruction

Use Instructions

- How to run server: In '/server' directory, run `npm install` and then
`npm start`
- How to run client: In '/client' directory, run `npm install` and then
`npm start`

Weekly Meeting w/ Notes

The screenshot shows a GitHub repository interface for a team's TDD meeting notes. On the left, the file structure is visible, including files like `code_of_conduct.md`, `meeting_notes.md`, and `safety.png`. The main area displays the content of `meeting_notes.md`.

Team 4 - TDD Meeting Notes

Author: Hao Luo, Devam Dave

Meeting on October 16th, 2023

Participants

- Hao
- Omkar
- Ben
- Karan
- Yunlong
- Suhes
- Zheyu

Agenda

- Icebreaker and getting to know everyone
- Decide team name, slogan, and team branding
- Discuss ideas for Team Intro presentation

Meeting Details

Location: Starbucks near Grad Housing

Presentation Details

- Duration: 8-10 mins
- Slides: [Google Slides Link](#)

Team Information

- Team Name: TDO - Thomas-driven Developers
 - Note: This got 5 out of 7 votes.
 - Idea: During the presentation, we can first ask people to guess what it means (if we like drama).
- Team Branding: Following the "Thomas" theme, inspired by @BenKlingnerSmith's idea of Thomas & Friends/Thomas the Tank Engine.
 - Team Picture: Use the team picture from today and add Thomas the Tank Engine in the middle, with the Professor's face on it.
 - Action Item: @Omkar Bhoop to help with this. Add Devam in the picture.
 - Note: @Omkar Dave introduced in slack since he wasn't able to make it to the in person meeting.
- Personas/Mascots
 - Choose a character from Thomas & Friends as an avatar/mascot for each team member.
 - Thomas & Friends Characters
 - Action Item: vote on whether we should do this as a team.

Slogan

- Slogan (TBD): "We go full steam together"
 - Inspired by this song: [We Make a Team Together](#)
 - [Song Links](#)
 - Idea: Play this in class until the slogan appears in the song.

Team Skills and Experiences

- Word Cloud: Use [WordArt](#) to create a word cloud of shared skills/experiences.

Standup Meetings

← → ⏪ ⏩ Search CSE 210 Team 4 ⏕ ?

CSE 210 Team 4

Threads Drafts & sent 1

Channels

- # 1-forming-aka-fun
- # 2-warm-up-activity
- # 3-ideation
- # 4-basic-network-visualization
- # backend
- # general
- # random
- # standup**
- team-leads
- + Add channels

Direct messages

- Ben Klingsmith
- Keran Wang
- Zheyu Fu
- Omkar Bhope, Suhas
- Devam Dave
- Gagan Gopalchand

standup

Monday, December 4th

Hao Luo 10:30 AM @channel Good morning everyone. Time for standup!

2 replies Last reply 11 days ago

Tuesday, December 5th

Hao Luo 10:42 AM @channel standup time!

7 replies Last reply 10 days ago

Wednesday, December 6th

Hao Luo 9:07 AM @channel happy Wednesday and it's time for standup!

4 replies Last reply 9 days ago

Thursday, December 7th

Hao Luo 3:02 PM @channel never too late for a standup

1 reply Last reply 8 days ago

Thread

others can start building on it in case or wait until unit tests ?

Hao Luo 11 days ago i will wait for your unit test

Keran Wang 11 days ago I merge the basic-server-api into the backend branch, and solve most comments (I'll double check). I updated the initialize api and its associated documentation: the "initialize" api returns relations and list of account info (graph data). I have a paper due tomorrow, and I'll be busy today and tomorrow. I will add unit tests when I have time and the rest of this week.

Yunlong Wang 11 days ago Just pulled your repo to my local yesterday, planning to work on the integration today

Devam Dave 11 days ago Cloned the repo. Will have some progress to share by tomorrow.

Files

main ▼ + 🔍

🔍 Go to file t

> 📁 .github

↳ 📁 admin

↳ 📁 branding

📄 82j3xt.jpg

📄 82j47o.jpg

📄 82j4g9.jpg

📄 82j4li.jpg

↳ 📁 logistics

📄 code_of_conduct.md

📄 meeting_notes.md

📄 safety.png

↳ 📁 presentations

📄 1_team_intro.pdf

📄 2_ideation_pitch.pdf

📄 3_mse_chapter_12.pdf

📄 4_first_demo.pdf

210-Team4-TDD / admin / branding / 82j47o.jpg 🔗



alexluo1998 Set up admin folder and add content (#43) ...

7a5485a · 3 days ago

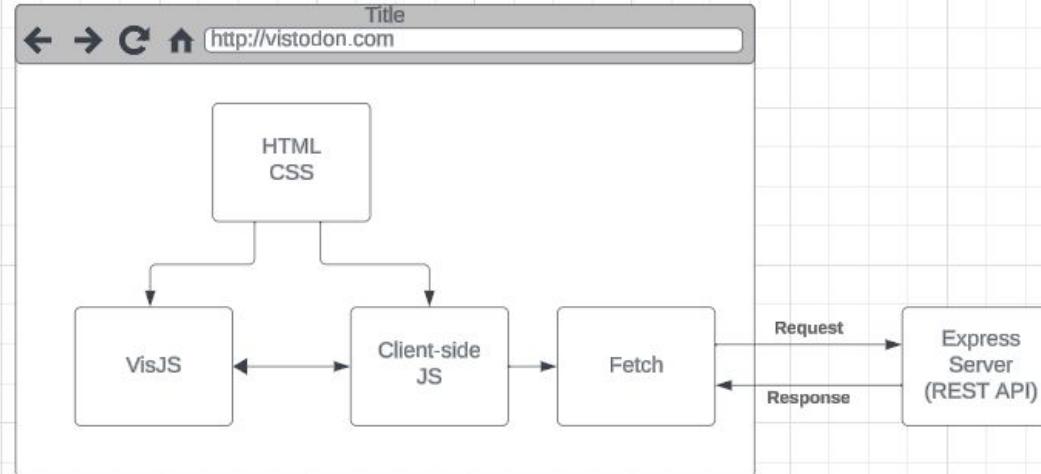
72.9 KB



04

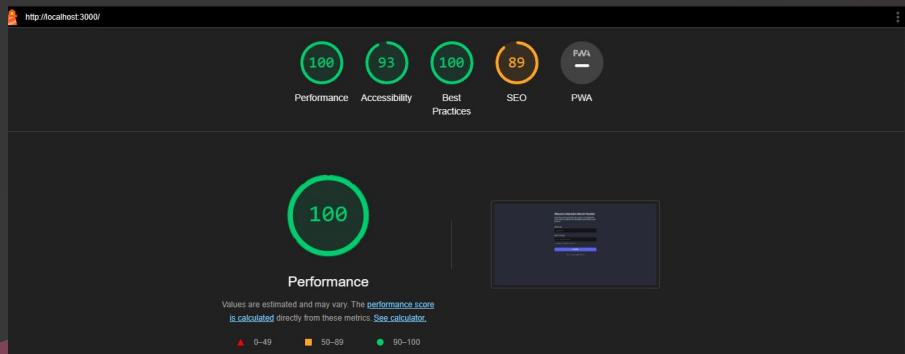
Architecture & System

Frontend overview

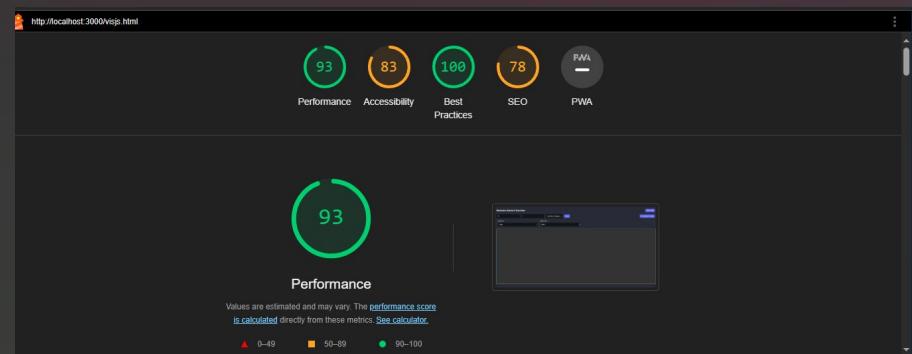


Frontend overview

- HTML, CSS, JS
- Express Server
- Network visualization library – visjs
-

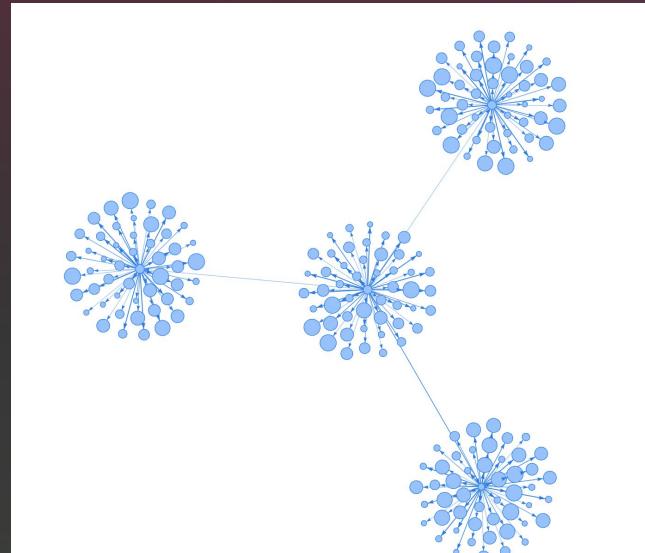
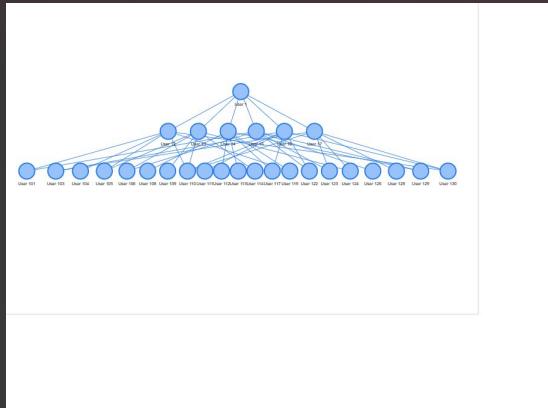
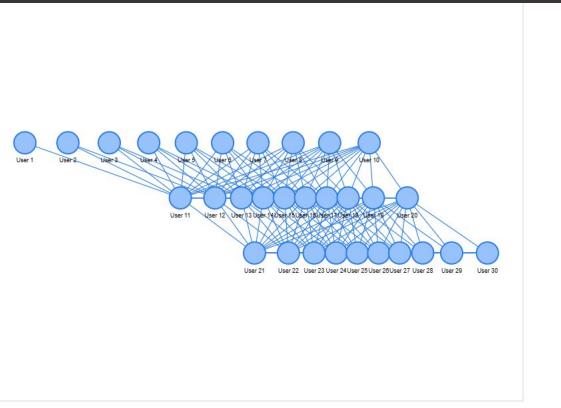


Performance of login page



Performance of home page

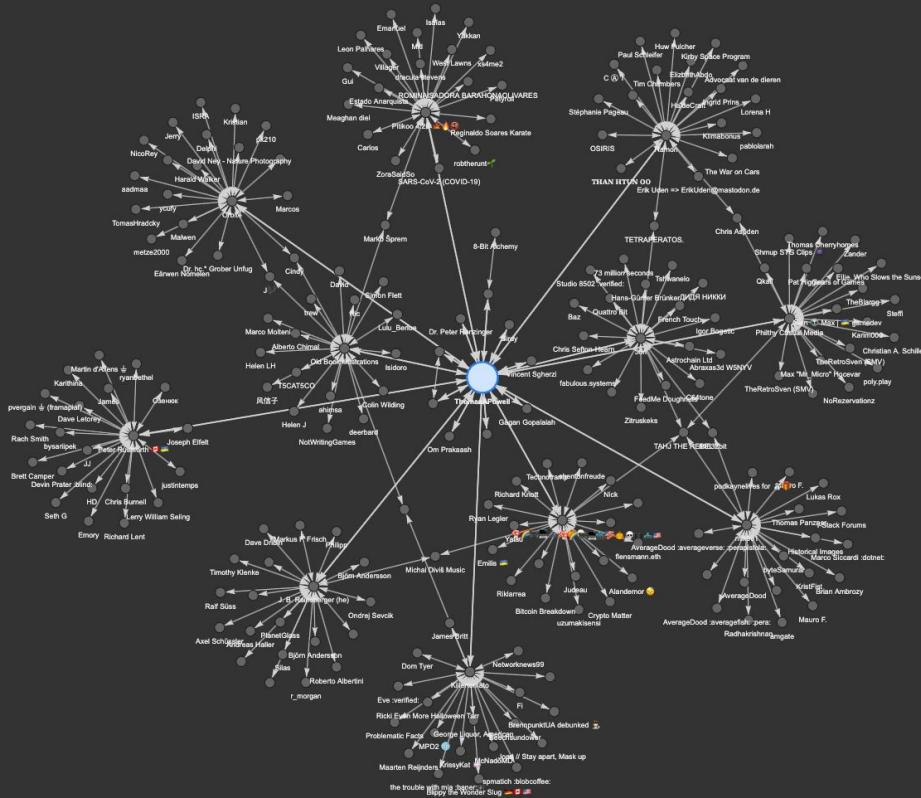
Vis.js



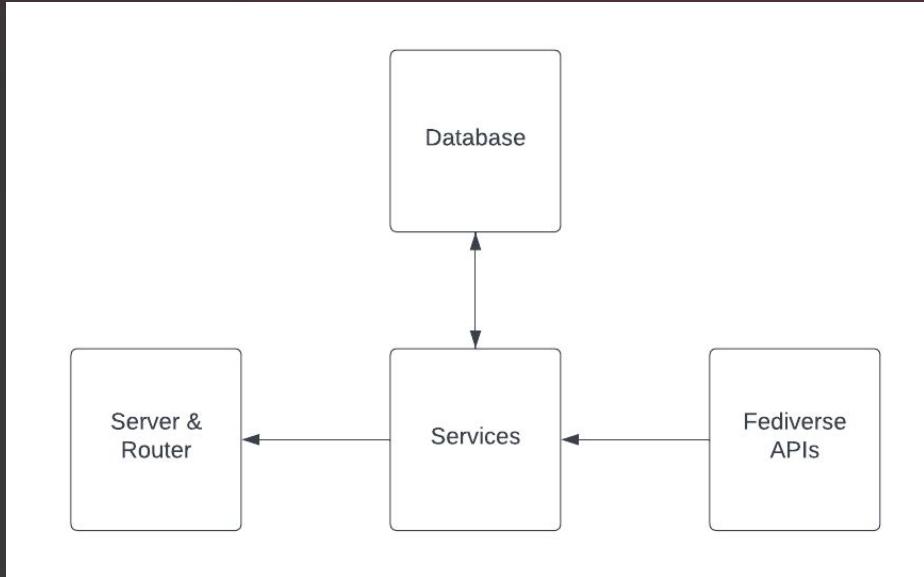
Scale nodes and edges depending on their value. Hover over the edges to get a popup with more information.

109252111498807689

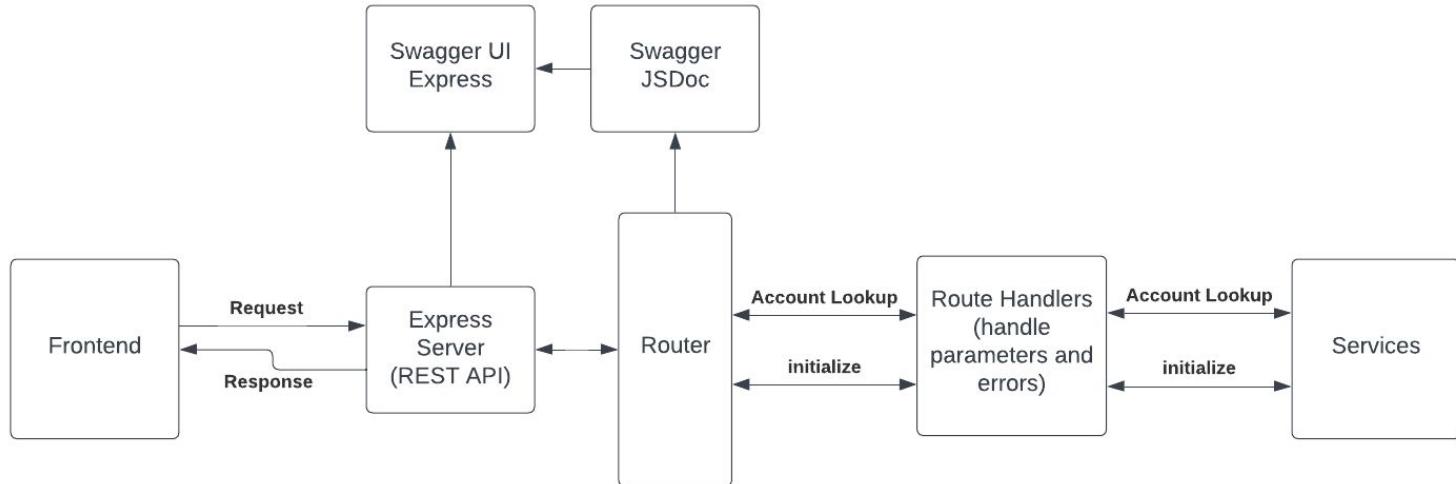
Enter



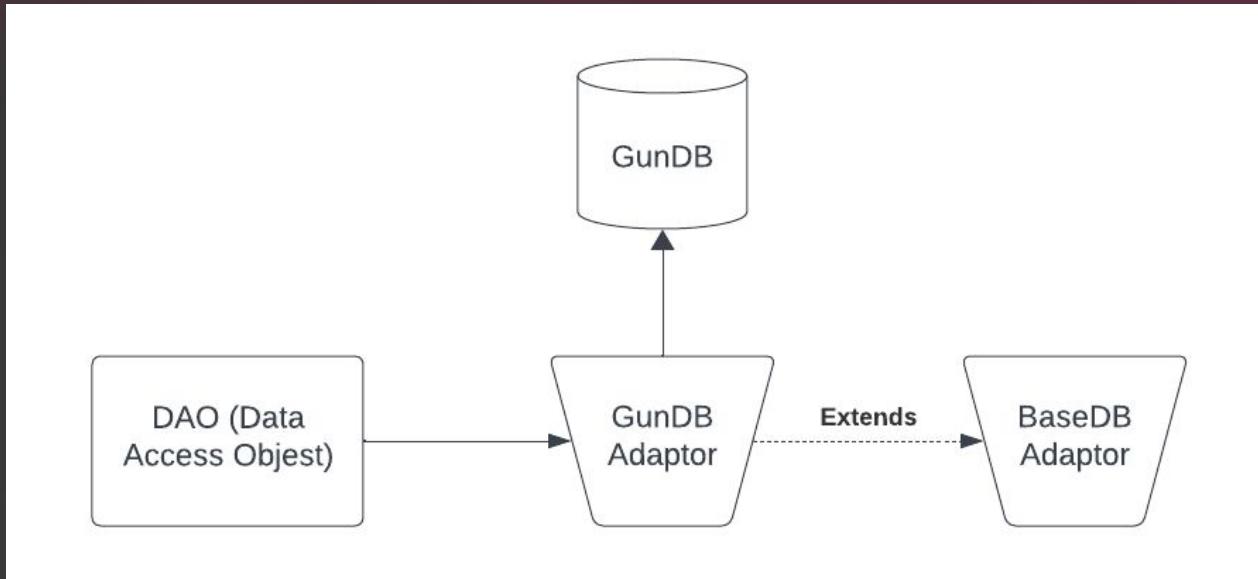
Backend Overview



Server & Router

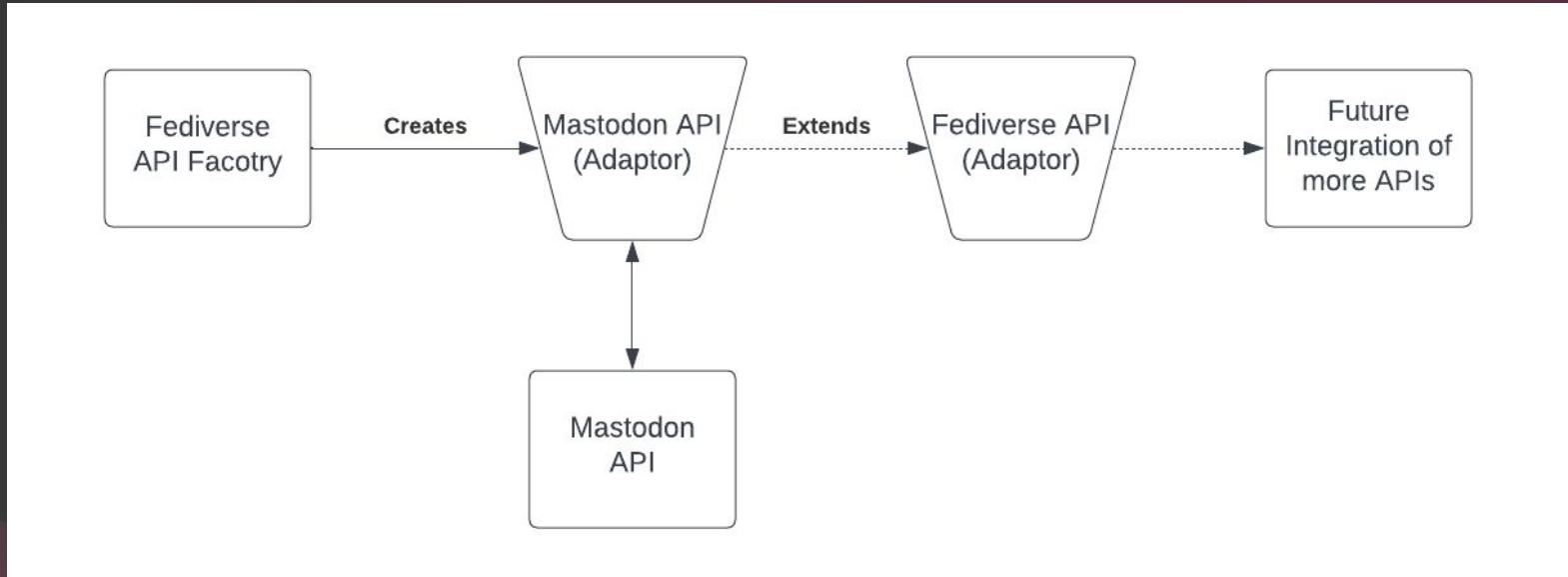


Database



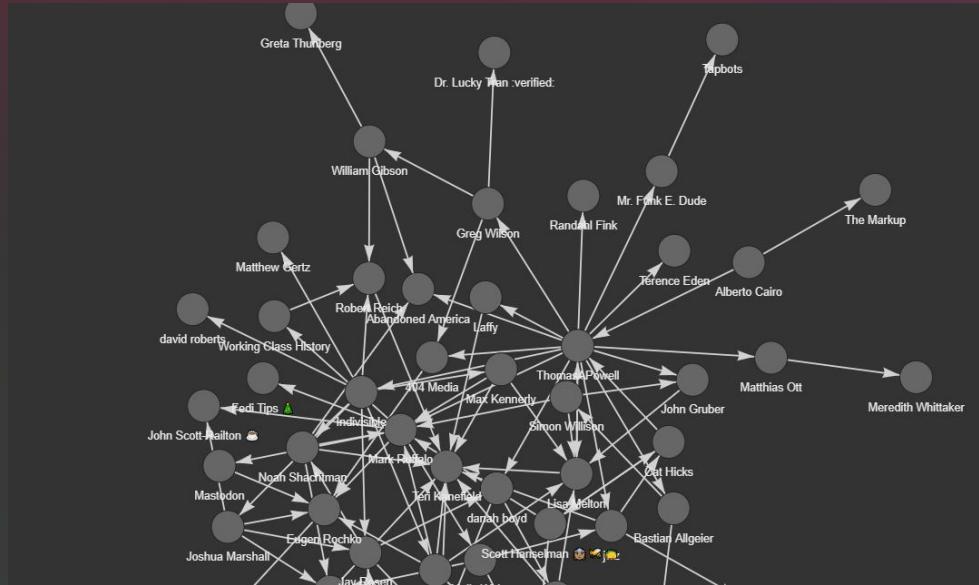
Note: we eventually removed the gun database because of the unpredictable response time using the `.get()` method. It returns something like a listener that reacts to any changes in the requested data in real-time, but not a Promise or a standard callback result, which we can't post-process immediately.

Fediverse API Integration



Node Selection

- Too many nodes
 - Greedy heap search
 - Max Nodes
- Node Rank
- Locality



05

Limitation and Future Works

Limitation

1. It takes long time to generate data and render for a large amount of nodes. Eg: 500 nodes take 1 min to get data from backend and another 1 min to render.
2. Mastodon pagination issue. Mastodon api returns up to 40 records of followers or followings for each account, we can implement pagination for more records if needed.

Future Works

1. Expand to other fediverse platforms and combine them all into one graph.
2. Add new options for graph visualization and control.
3. Show each account's recent posts in the graph, so that the user can know more about the accounts using our app.
4. Have the visualization change dynamically. Right now, if we have visualized our graph and new friends are added/existing friends are removed, the graph will not change dynamically.
5. Use OAuth to allow user log in their accounts and follow other users' accounts directly in our visualization graph.

06

Lessons Learned

Lessons Learned

1. From our mistake in DB choice:
 - Check issues before using an open source project, know what can go wrong, but abstraction / Separation of Concern does work
2. It's not good to create huge PRs, which create merge hell (Incrementalism).
3. More on separation of concern: we merged most of our features late in the process but our use of adaptors (in BE architecture), frontend/backend contract etc. made it much less painful than it could've been
4. Project management is hard and 3rd party APIs are the source of all evil

Thank You!

Do you have any questions?