

Back End Development

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AI Tools for Software Development

<https://ai-developer-tools.github.io>

Austin Henley and Andrew Begel

Today

- Sign up for a reflection! <https://bit.ly/reflection-week-7>
- Project Team Meeting
- Full stack development
- Web app notifications

Project Team Meeting

- Spend the next 20 minutes to meet with your team.
- Work on P4: Backend Development

How does Tinder make a match?

- Two people swipe right (like) each other.
- Backend recognizes the event.
- Tinder notifies both users, "It's a match!"

How do we implement notifications?

- Let's ask ChatGPT.

You are a backend software developer.

Your goal is to implement a notification system to tell frontend users about an event that happened on the backend server.

Instructions:

- Analyze W3C specifications, Google Chrome documentation, and Apple Safari documentation to find out how applications set up user notifications. Also find out how a backend server written in Javascript would notify a frontend that there's an interesting event to notify the user about?
- Identify two specific approaches and explain each.
- Evaluate each approach for ease of development, especially for a person who is not familiar with backend server coding.
- The response should be formatted as a list of findings.

Two Ways to Do Notifications

- Frontend poll
 - Every n seconds, the frontend calls a backend endpoint to see if there are any new matches.
 - How's this for battery life (especially if you're not popular)?
- Push notification
 - Whenever the backend discovers a match, it sends a *push notification* to the frontend UI of each user.
 - The user who swiped last is easy to notify.
 - What if the other user isn't currently using the app?
 - Wait til they turn on the app.
 - Force their computer to notify them now!

Mobbing Activity

- Mobber will come to the hot seat.
 - Notetaker sits in the front of the class with their laptop to take notes in the #mobbing channel.
1. Let's make a full stack Tinder app.
 2. Then, make the frontend poll the backend every 10 seconds for matches. The backend needs a function to receive poll requests.
 3. Mock the 'likes' database so that you're likely to get a match during testing.
 4. Test it out!
- Everyone tell the mobber what to say to the LLM. Use the prompt templates!

Evaluate the Results

- Architect
 - You are a frontend architect. What is the purpose of this code? Explain the high-level structure and any design patterns used.
 - You are a backend architect. What is the purpose of this code? Explain the high-level structure and any design patterns used.
- Developer
 - You are a senior developer who has been looking over my shoulder while I created this code. Show me the frontend code that processes the notifications and explain it to me.
 - You are a senior developer who has built a ton of dating applications. How does this app notify users that they have a match? Explain it like this is my first full stack web app.
- Tester
 - You are an experienced software tester. Explain the impact to my laptop's battery life with the poll mechanism used by the application. How can I reduce the impact?

Push Notifications

1. When users start Tinder, frontend UI checks for Push API support.
2. Register a service worker to listen for future notification events.
 - a) Ask the user to grant permission to send them a push notification.
 - b) Subscribe to notifications by creating a subscription object using the applicationServerKey.
 - c) An applicationServerKey is generated by the backend and passed to the client during subscription. It has a public key and a private key for encrypting notification messages.
3. Send the subscription object to the backend.
4. When there's an event, the backend's Push Manager will send push events to all relevant subscriptions.
5. Frontend's service worker will listen for the event and trigger a push notification in the frontend UI.

Mobbing Activity

- Swap the mobber and notetaker.
- Notetaker sits in the front of the class with their laptop to take notes in the #mobbing channel.
 1. Make a new full stack Tinder app.
 2. Now, implement push notifications in the frontend and the backend.
 3. Again, mock the 'likes' database so that you're likely to get a match during testing.
 4. Test it out!
- Everyone tell the mobber what to say to the LLM. Use the prompt templates!

Evaluate the Results

- Developer
 - You are a security engineer. Explain how the backend identifies which frontend it should send the notification to and how only the *right* frontend can read it.