Aggre-Gator

An RSS & Atom Feed Reader

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CSC 468 – Introduction to Cloud Computing
Dr. Linh B. Ngo — Spring 2025
West Chester University of Pennsylvania

Overview

Many sites publish RSS or Atom feeds, including YouTube, GitHub, and many others. An RSS reader allows a user to subscribe to several of these feeds, and displays updates. This has a number of benefits, as seen in Figure 1. We propose a web-based reader, Aggre-Gator, that syndicates an arbitrary number of RSS and Atom feeds, presents them in a user-friendly way, and syncs across devices.

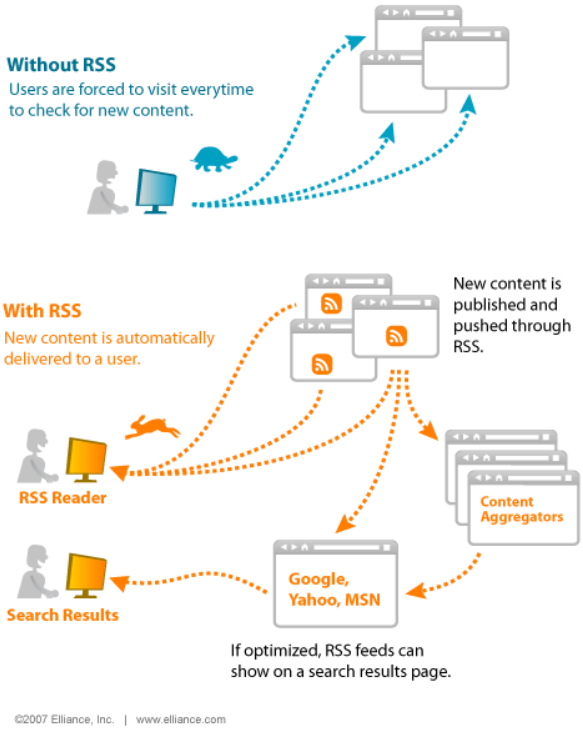

Figure 1: The benefits of RSS

Chapter 1

The core functionality of Aggre-Gator will be fairly similar to other local application feed readers. However, it will have some notable differences on account of being cloud-based. The basic function of an RSS/Atom reader is:

- The user configures a list of feeds they are interested in.
- The user instructs the reader to refresh the feeds.
- The reader fetches a list of articles from each feed.
- The reader presents the articles to the user, both as a link and potentially as content.
- The reader saves the articles for later viewing.

Being cloud-based adds additional advantages:

- We can refresh feeds in the background, between site visits, so the user doesn't miss articles.
- Instead of a local application tied to a specific operating system or platform, our app is accessible everywhere.
- Your subscriptions and article library follow you between devices.

This describes our general goal for the project. However, if we finish this early, there are some additional features on our wishlist, time permitting:

- SSO user accounts with Google and/or GitHub login

- Exporting an aggregate feed to external feed readers
- Bookmarking articles to save them for later
- Web push notifications for select feeds
- Sending articles from your feeds to other users
- Production-grade deployment
  - All physical nodes running NixOS
  - Multi-node Kubernetes clusters
  - Geographically distributed - potentially South Carolina, Utah, France
  - Fully automated - instantiating CloudLab profile deploys everything
- A second sillier, overcomplicated deployment strategy

Chapter 2

In terms of implementing our vision, we decided to split the project into frontend and backend blocks, as seen in Figure 2. In order to ease deployment, the frontend is a static site with client-side interactivity. We have created a container to serve the frontend, which contains nothing but NGINX and its libraries and the content to serve. The backend will consist of three (potentially subject to change) containers: the database, the API, and the feed fetcher.

Frontend

Because the frontend is a static site, we have considerable flexibility deploying it. Currently, we simply serve it with NGINX, but we have the flexibility to serve it using a CDN or with any sort of intermediate caching. In addition, we can set all assets except HTML and the favicon (and *maybe* a couple other things) to be cached indefinitely in the browser, which both increases load times and decreases the load on our servers, potentially quite significantly.

The reason we can cache the majority of assets is because the names are hash-based. This is because we use a build tool called Vite. Vite also bundles and minifies all assets for us. We also use Lightning CSS, a CSS processor and `vite-imagetools`, which optimizes images for size.

Instead of plain JavaScript, we opted to use Typescript for better error checking and IDE integration. The current plan is to not use a web framework, though this may change if using one proves useful. We also have ESLint set up to catch errors and mistakes that the Typescript compiler might miss.

Backend

The backend will consist of three parts: the database, the API, and the feed fetcher. The current plan is for the NGINX container serving the frontend to proxy requests to the API server. This means that SSL configuration is centralized, and is all around simpler than

hosting the API completely separately. This API will allow the frontend to communicate with the database.

For the database, we will use Postgres. Postgres has the ability to store text data such as article content in the `text` type, and, should we need it, can also store JSON efficiently and in a queryable manner in the `jsonb` type. We believe that for this project, any document-style data is best stored in a battle-tested DBMS like Postgres, as opposed to a dedicated document-only database like Mongo. If we have the time to have multiple global points of presence, Postgres supports replication, which should make things easier.

Also note that in Figure 2 below, the **User DB** and the **Article & Feed DB** will most likely be in the same Postgres instance for simplicity.

The feed fetcher will periodically get a list of feeds to refresh from the User DB, fetch the content from the web, and store the result in the Article & Feed DB. Having this as a separate component will hopefully allow us to scale it separately from other parts of the backend.

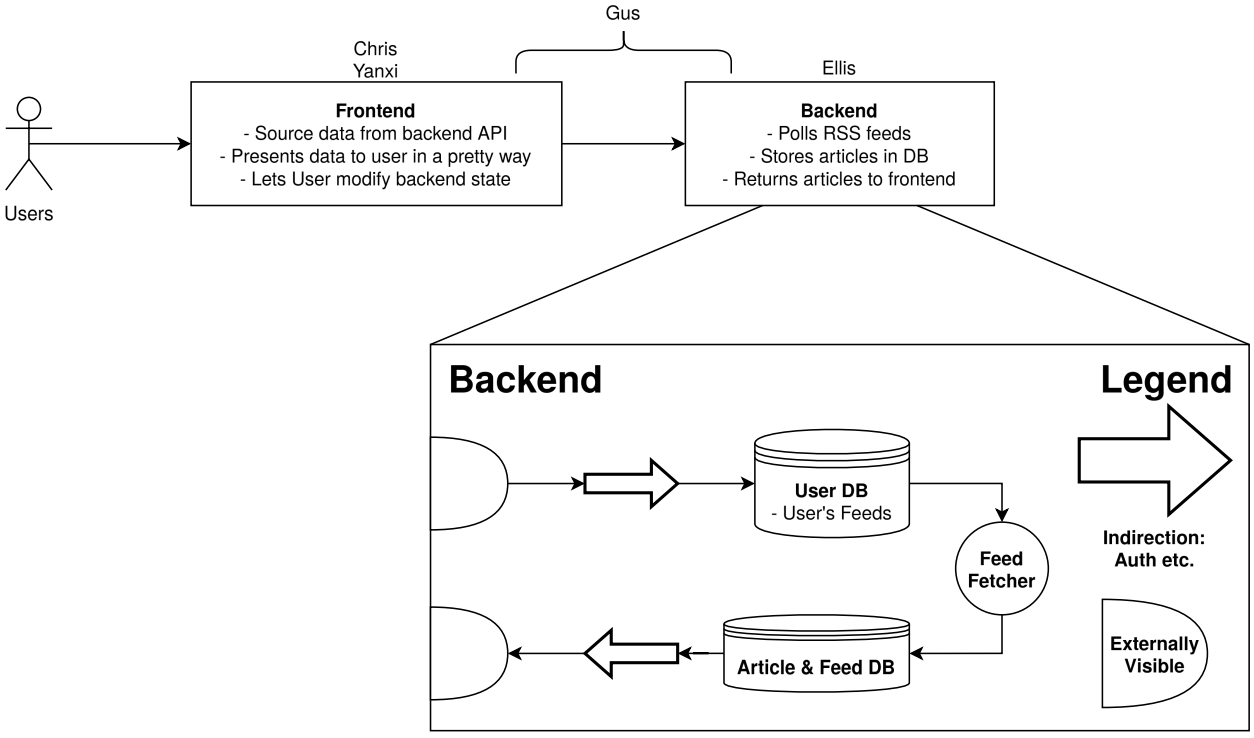

Figure 2: Design of Aggre-Gator

Team Organization and Management

Yanxi and Chris will make up the Frontend Team and be responsible for both the design and implementation of the web UI. Ellis will be responsible for deployment and will work on the backend. Gus will work on the integration of the backend and frontend, contributing some to both, and potentially also working on testing and quality assurance.

The project is being developed in GitHub. We will track work and any bugs with issues. We also have a Github Project which integrates with issues to provide a more focused, actionable dashboard than simply searching through issues.

We plan to do development in individual or team feature branches, and use PRs to merge completed features. This ensures proper code review, while enabling the group to work efficiently on several things at once.

Gus Johannesen

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Professional Summary

Upcoming Computer Science graduate seeking employment. Hands-on experience in full-stack development, Agile workflows, and API integration. Highly motivated and eager to build high-impact software solutions. Strong collaborator with a proven ability to enhance digital experiences and drive engagement through innovative technology.

Education

West Chester University of Pennsylvania **September 2021 – May 2025**
Bachelor of Science in Computer Science *West Chester, PA*

Experience

JCI **May 2024 - August 2024**
Application Developer *West Chester, PA*

- Developed full-stack solutions for the Cold Plunge app using Swift and Xcode.
- Collaborated with cross-functional teams in Agile workflows to meet milestones and maintain code quality.
- Enhanced SEO strategies and web traffic analytics to boost user engagement.

Hills Quality Seafood **April 2021 – Present**
Sales and Operations Associate *Glen Mills, PA*

- Manage customer transactions, product prep, and inventory for smooth operations.
- Took on leadership tasks, optimizing market workflows and managing high-volume holiday operations.
- Coordinated 300+ pre-placed orders, creating efficient systems for logging and retrieval.

Covenant Fellowship Church **April 2021 - Present**
Technical Event Support *Glen Mills, PA*

- Operate light-board software and train junior technicians.
- Design visual elements to enhance event ambiance and success.

Projects

Cold Plunge App **May 2024 - August 2024**

- Developed key features using Swift/Xcode, transitioning from timer-based to real-time stopwatch.
- Collaborated on backend integration with Azure/GitHub for version control and deployment.
- Performed QA testing to identify and resolve bugs, ensuring a polished user interface.

Chesco Association for the Blind and Visually Impaired Website **August 2024 - December 2024**

- Collaborated to improve UI/UX for accessibility and user-friendliness.
- Authored documentation for future updates and maintenance.
- Redesigned website pages, enhancing visual appeal and navigation.

Leadership / Campus Involvement

Campus Cru **Sept 2021 - Present**

- Plan and execute weekly meetings and community-building events.
- Serve and invest in the community, inspiring others.

Volleyball Coach **Sept 2021 - May 2023**

- Trained youth volleyball players, fostering a winning mentality.
- Strengthened the team physically and mentally.

Scouting BSA **May 2015 - Mar 2021**
Eagle Scout *Troop 93*

- Achieved Eagle Scout and served as a leader on the executive board.
- Demonstrated leadership, service, and perseverance.

Technical Skills

Languages: Java, Swift
Developer Tools: XCode, VS Code, Jupyter Notebook
Technologies/Frameworks: Git, GitHub, Azure DevOps

CHRIS K. ROSS

215-667-5793 chriskross192@gmail.com

Education

West Chester University of Pennsylvania | B.S. in Computer Science
August 2024 – present

Delaware County Community College | A.S. in Computer Science
August 2021 – May 2024

Interboro High School | Graduated with Honors
September 2017 – June 2021

Work Experience

Chipotle

Service/Kitchen Manager | Multiple locations |May 2022 – present

- Led and trained teams of employees to deliver exceptional customer service and improve operational efficiency.
- Oversaw daily operations, including inventory management and compliance with health and safety standards.
- Collaborated with upper management to implement process improvements, reducing waste and increasing efficiency.

Projects

Text Processor

Developed a Java-based program that parses .txt files, extracts relevant data, and generates .csv files with summarized information to streamline data analysis.

Air-Traffic Control Simulator

Built a Java-based simulation that models air traffic patterns, managing multiple aircraft and simulating real-time control scenarios to ensure safe and efficient airspace coordination.

Relevant Coursework

- Foundations of Computer Science
- Computer Science I, II, & III
- Data Structures and Algorithms
- Computer Systems
- Computer Security & Ethics

Awards & Achievements

- Dean's List Fall 2024, Spring 2024, Fall 2022
- 4.0 GPA

Ellis Weaver-Kreider

717-318-3451 ellisweaverkreider@gmail.com

Work Experience

Production Crew, *Mennocon*
Kansas City, MO

National Convention for Mennonite Church USA
July 2023

- Operated fixed and mobile cameras according to direction of video director
- Mixed audio for subsequent climate summit
- Worked closely with other volunteers and employees to ensure seamless experience for attendees

Tech Crew, *Lancaster Mennonite School*
Lancaster, PA

Thrice-weekly school assembly and outside events
August 2017 - June 2023

- Mixed audio for band, orchestra, and external music groups
- Managed slideshows and other graphical content for presenters
- Operated stage lighting system for dance productions
- Operated fixed and mobile cameras
- Mixed video signals for projection and recording
- Worked effectively as part of a team

Drama Production Crew, *Lancaster Mennonite School*
Lancaster, PA

Set construction, lighting, and sound for stage productions
2017 - 2023

- Worked with other students and alumni to construct complex sets including life-size building facades
- Helped lighting engineer hang and remove lighting fixtures
- Worked as primary audio engineer to mix all actors on stage and a band/pit orchestra for musicals
- Assisted Radio Frequency Technicians in miking and de-miking actors
- Operated sound effect system

Honors & Awards

Academic
- AP Scholar with Distinction
- PHEAA Certificate of Merit
- National Merit Scholarship Letter of Commendation

Programming
- 2024 PACISE Programming Competition – First Place
- 2024 International Collegiate Programming Competition – First Place Regional Division 2

Education

West Chester University of Pennsylvania
Pursuing B.S. in Computer Science

August 2023 - present

Lancaster Mennonite High School

August 2019 - June 2023

Yanxi Wei

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yw1021529@wcupa.edu • (856) 522-3470

EDUCATION

West Chester University of Pennsylvania, West Chester, PA
Bachelor of Science in Computer Science, Graduation: Spring 2025
GPA: 3.9/4.0

Relevant Coursework :

- Computer Science I, II & III
- Foundations of Computer Science
- Data Structures and Algorithms
- Computer Systems
- Computer Security
- Data Science
- Digital Image Processing
- Program Lang Concepts/Paradigm
- Modern Web Applications

Honors and Achievements

- Dean's List, College of the Sciences and Mathematics (Fall 2024)
- Inducted Member of Upsilon Pi Epsilon (UPE) – The International Computer Science Honor Society (Spring 2025)

Technical Skills

- Programming Languages: Java, Python, C
- Web Development: HTML, CSS, JavaScript, REST APIs
- Cloud Technologies:Docker, CloudLab, Virtualization, Containerization
- Tools & Platforms: GitHub, IntelliJ IDEA, PyCharm, VS Code

ACADEMIC PROJECTS

Email Classification and Spam Analysis System, Team Project (Fall 2023)
Role: reader and Parser- Made CSV parser and reader.
Developed a CSV parser and reader for a spam classification system using a bag of words approach. Assisted in training the classifier to identify common words and phrases in spam and ham emails, and calculated accuracy and Euclidean distance metrics.
Worked with team members to integrate CSV reading with algorithm development for classification, ensuring clean data processing and accurate results.

Obesity Analysis Based on Socioeconomic Factors, Personal Project (Fall 2024)
Role: Data Analysis and Visualization
Conducted statistical analysis on the relationship between obesity rates in the U.S. and socioeconomic factors such as age, income, education level, and gender. Utilized the BRFSS dataset from the CDC and applied regression models, ANOVA, and interaction effect analysis to evaluate key influencing variables. Performed data preprocessing, statistical modeling, and visualization to derive insights for public health interventions, ensuring data-driven conclusions.

Additional Information

- Languages: English (Fluent), Chinese (Native)
- Interests: AI technology, Cloud Computing, Web Development, Data Science