Real Time Gliding Weather

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https://github.com/mstubert/rt-gliding-weather

https://gliding-weather.cyclic.app/

Purpose of the Web Application

The web application should be designed for glider pilots to check local weather information. This information can be used for their flight routes. As the accuracy of forecasts is limited with respect to local weather phenomena like thermals, pilots can benefit from real time information reported by other pilots using this application. In this way flight routes can be adapted considering recent weather data and average cruising speed of gliders can be maximized.

Architecture Diagram and Technology Overview
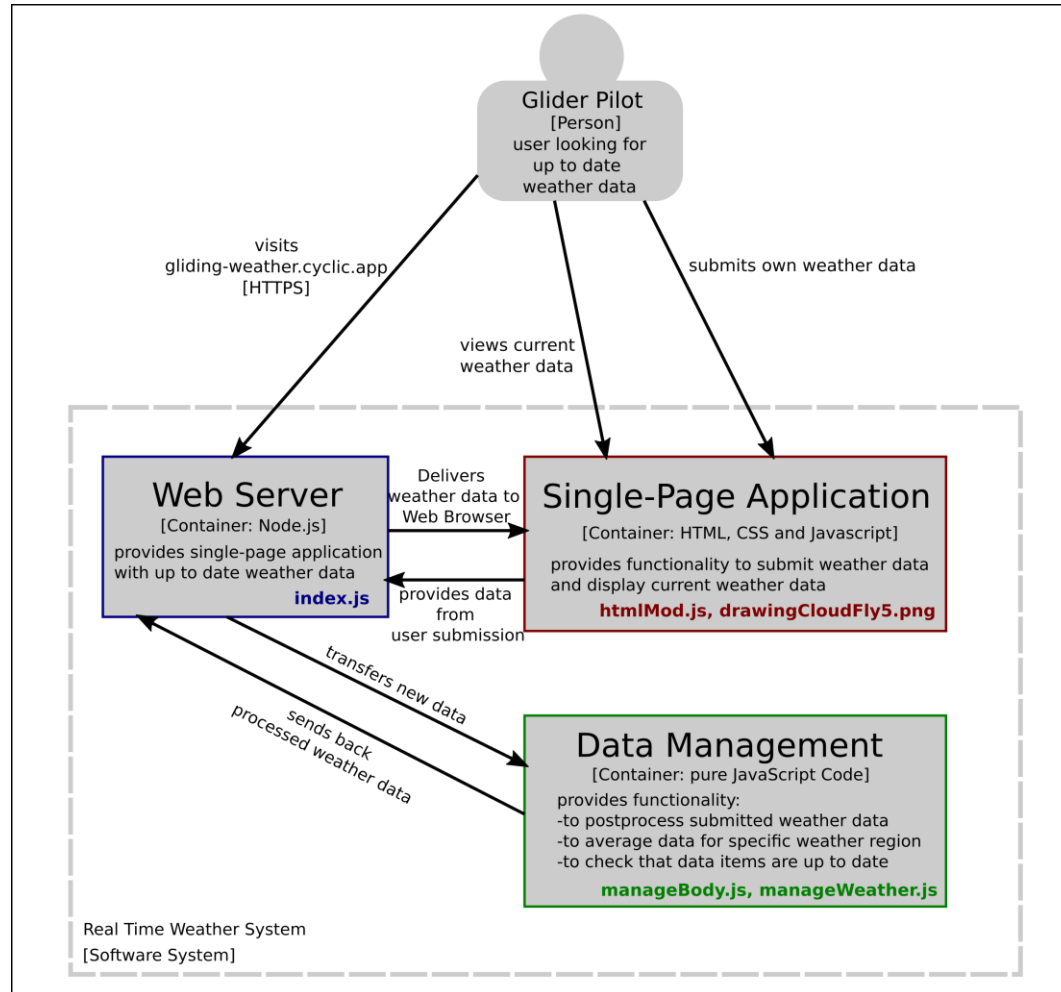
Technologies

Front End: {Single Page Application}

- HTML, CSS (static content)
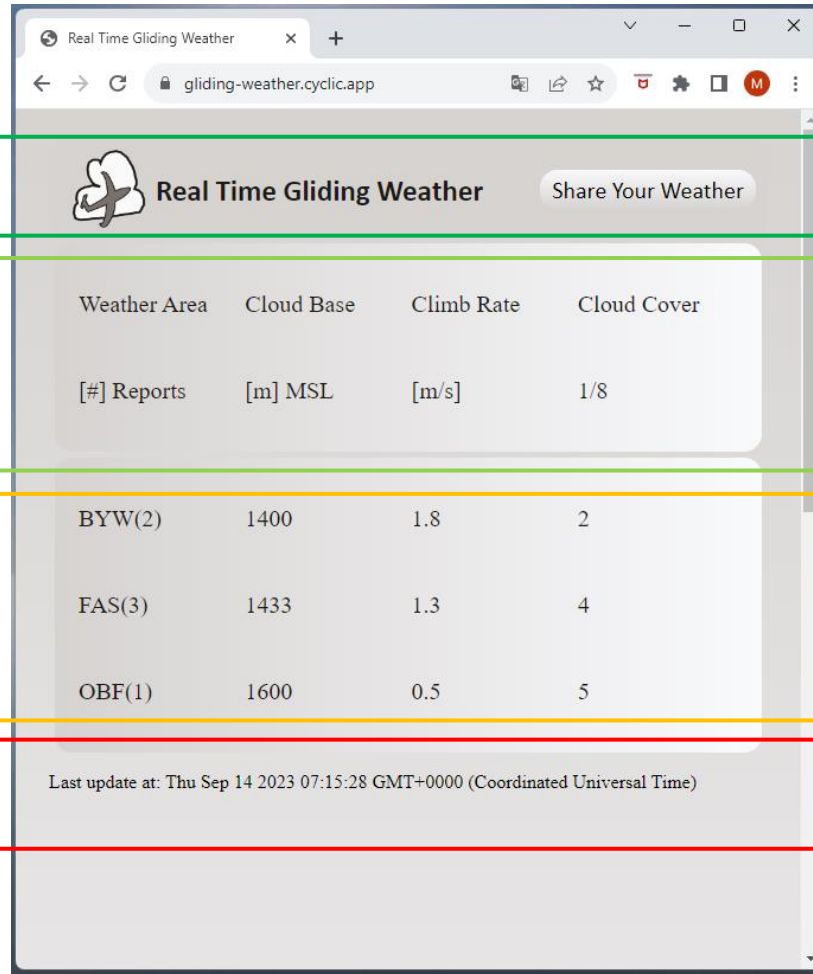- JavaScript (dynamic changes)

Back End: {Web Server, Data Management}

- Node JS as server application
- Java Script Code for Data
  Management on Server Side

Web Application – Introduction and Functionality

Application in Browser

Description:

Header + Button for opening of selection menu to share weather data

Legend for weather properties:
- Weather Area name with number of shared weather reports
- Cloud Base altitude in meter over Mean Sea Level (MSL)
- Climb Rate averaged in meter per second by using thermals
- Cloud Cover as degree of sky coverage

Weather data table submitted by pilots and averaged by the application
-> one weather line item per weather area
Example: 3 weather reports for Franconian Jura South (FAS) Area
with Cloud Base of 1433m MSL, Climb Rate of 1.3 m/s and 4/8 Cloud Coverage

Indicator for last weather update. Automatic client request every two minutes. Time in UTC.

Web Application – Introduction and Functionality

Application in Browser

Description:

After clicking button "Share Your Weather" (see Page 4) new page content added for sharing weather data. For moving back to initial page button "Close" available
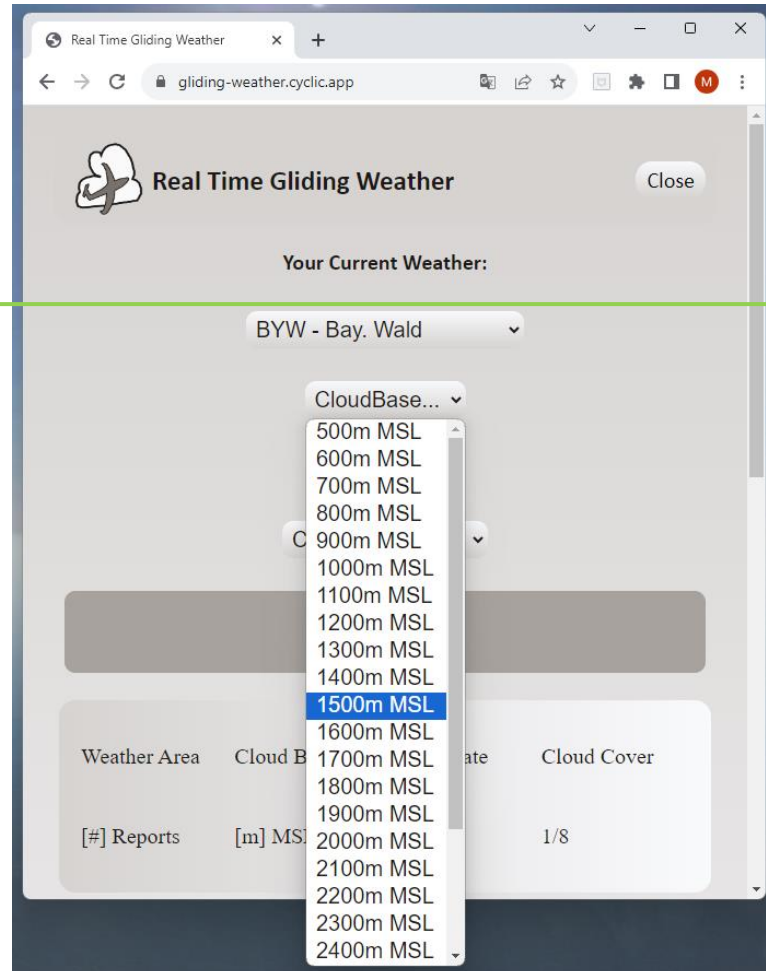
- Selection menu for sharing weather data
- Drop down selection for   Weather Area,
                        Cloud Base,
                        Climb Rate
                        Cloud Coverage

- Submit Button
  Application checks for valid submission, valid means one argument per weather property. If invalid, data will not be added to the server data

Legend of current weather data

By scrolling down available weather data table shown as on initial page

Web Application – Introduction and Functionality

Application in Browser

Description:

Drop down selection
- Weather Area selected: BYW – Bay. Wald
- Cloud Base current selection: 1500m MSL
- Climb Rate to be defined (hidden by previous selection in this picture)
- Cloud Cover to be defined (hidden by previous selection in this picture)

Web Application – Introduction and Functionality

Application in Browser

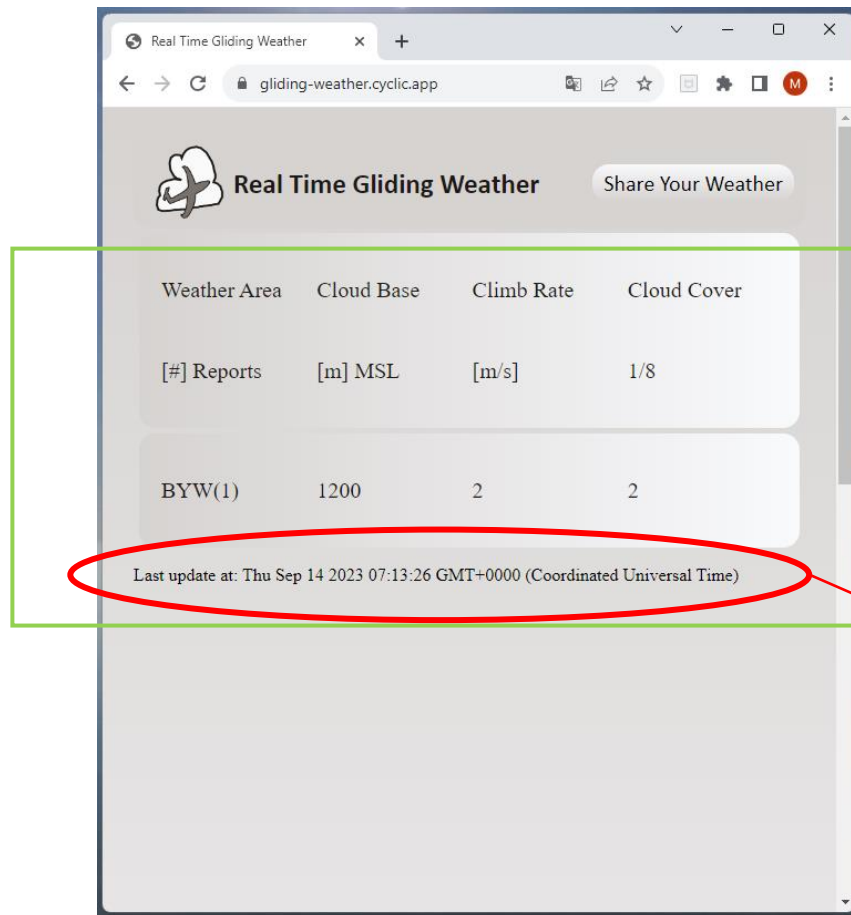## Description:

Drop down selection finished
- Weather Area selected: BYW – Bay. Wald
- Cloud Base current selection: 1200m MSL
- Climb Rate: 2.0 m/s
- Cloud Cover: 2/8 few

Submission includes check for valid input (error handling):
Weather report is only added to data on server if all weather properties are selected

Web Application – Introduction and Functionality

Application in Browser

Description:

- Submission triggers switch to initial page.
- Selection can be viewed in weather data table
  - Weather Area selected: BYW – Bay. Wald
  - Cloud Base current selection: 1200m MSL
  - Climb Rate: 2 m/s
  - Cloud Cover: 2 / 8
- Weather data table consists of all shared weather data

Automatic client-based update every two minutes in UTC time

Changes compared to Concept Phase

- <u>User defined filtering for weather table entries not implemented</u>

Initial idea: weather data should be filtered according to user defined weather areas.

While designing the weather table the decision was made only to have one weather area per table entry. In this way entries of weather table are limited to whole number of weather areas. Pilots can try to check for alternative weather areas directly by scrolling down without losing the overview.

Filtering may not bring additional value to the application as pilots may search for alternative flight routes.

- <u>Number of reports per weather area implemented</u>

By showing the number of reports per weather area users can judge the reliability of weather data. As more users share condition of one area the probability of experiencing these conditions is higher.

Screencast Video