Lightning Talk

User Needs & Requirements

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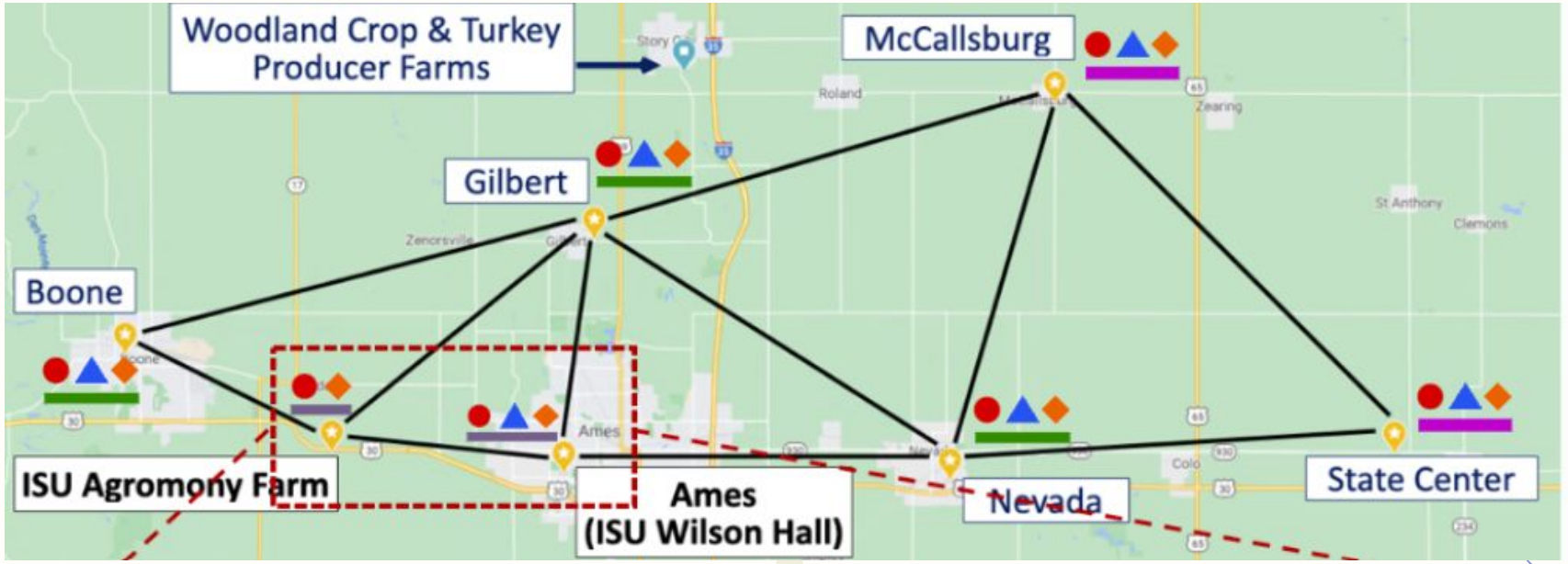
Project Overview

- ARA is an advanced wireless research platform covering Iowa State University, Ames, and nearby rural areas.
- Tasked with creating a system that will recognize and predict when a weather event is occurring.
- This trigger, signals data collection before a given weather event has begun and allows us to continue collecting data until the weather event has passed.
- This weather data will eventually allow researchers to determine how the performance from the ARA framework differs during different weather events.

Agronomy Farm

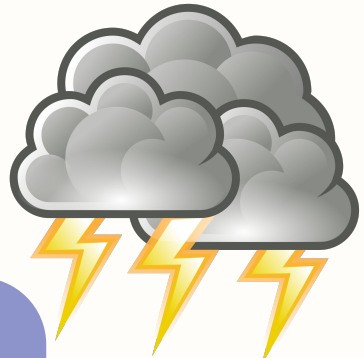
Wilson Hall

Project Overview



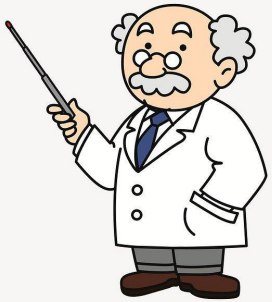
Problem Statement

- Want to intelligently collect a wide range of network data during a variety of weather events.
- Use forecast data to predict future weather events to gather data only when weather events we want to record are going to occur.
- Store collected data and allow for user queries to access and format selected data.



User Needs

- **ARA Researcher, Internal:**
  - The ARA researcher needs weather data to be collected when a weather event occurs because they want to collect, store and publish this information.
  - The ARA researcher needs weather data because they want to analyze how the ARA equipment was affected by weather events.



User Needs

- **Outside Researchers, External:**
  - The researchers need a way to know when weather events occurred because they will analyze how the weather affected his test results on the ARA framework.
  - The researchers need an easy way to query specific weather events data because they want to access weather event data efficiently.

Functional Requirements

- Must trigger collection based on abnormal weather conditions
- Must have lead in, lead out time before data collection
- Must utilize weather forecasting APIs for predictions
- Must utilize local weather data for validation
- Must be stored in a ZIP file hierarchy

tomorrow.io

OpenMeteo

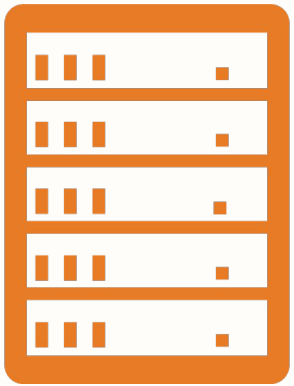
Resource Requirements

- Uses the ARA framework to collect, store, and provide access to weather data.
- Shall have access to external weather forecasting APIs
- Weather data shall be stored in the storage space provided by the ARA framework
- Shall run on the server space provided by the ARA framework

Aesthetic & User Experiential Requirements

- Shall be easy to use for someone who has experience running scripts using the command line
- GUI shall be intuitive to query data for users
- Have data visualization tools such as graphs and histograms

Query



Engineering Standards

1. Standard 1413, Framework for Reliability Prediction of Hardware
2. Standard 14764, Software Engineering Maintenance
3. Standard 1448a, Information Technology Life Cycle
4. Standard 1012, Software Verification and Validation
5. Standard 1063, Software User Documentation

Conclusion

We have identified:

- Our users and their needs
- The functional requirements of the system
- The non-functional requirements of the system
- The Engineering Standards related to our software

Any Questions and/or Suggestions?