

Lightning Talk

Users & Needs

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Project Overview

- ARA is an advanced wireless research platform covering Iowa State University, Ames, and nearby rural areas. It collects weather and wireless signal data.
- 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.

Problem Statement

- Want to intelligently collect data on 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 1: ARA Researcher- Iowa State

- Associate Research professor at Iowa State with a focus in networking
- Developing an ARA framework that can be used to enable research and development of wireless technologies.
- Having a goal of deploying multiple platforms such as massive MIMO wireless access, long distance backhaul, LEO satellite communications and multiple other wireless software platforms
- Wants to advance wireless technology through collaboration with industry and academia.

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User 2: Other Researcher- Outside Universities

- Long term researcher at Bell Laboratory, working on cutting edge network technology.
- Working on improving 5G connection in extreme weather conditions.
- Searching for large data sets of wireless performance data.



User 3: Student Researchers -Iowa State

- PhD student in computer engineering focused on doing wireless networking research within the ARA team.
- Research is focused on wireless connectivity for rural areas.
- Experimenting with ARA containers to provide high speed connectivity to rural communities.
- Helping in the effort to install ARA backhaul equipment around the Ames area.

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User Needs

- An application that predicts weather events based on outside APIs and ARA weather monitors.
- Trigger weather data collection such as precipitation, wind speeds, humidity, and temperature on
- Store the collected weather data from ARA weather stations in ZIP files
 - Eventually the data will be used to determine how weather events affect the wireless data being transmitted using the ARA infrastructure
- Collect wireless signal data from ARA framework during detected weather events
- Compile this information on an external site
 - Will be used by researchers to analyze and further their research

Conclusion

- The users need the weather data in order to determine if their experiment results are accurate based on how weather conditions affect the data being transmitted in the ARA framework.
- The weather data will help further wireless network research by providing critical knowledge of how weather events affect the deployed hardware.
- The weather data collected can also aide researchers specifically doing research in wireless communication during weather events.

