IRIS-HEP Fellowship Project Proposal

Kamayani Richhariya
State University of New York, Oswego

Mentors: Ilija Vukotic, Shawn McKee, Petya Vasileva

Project: Building an Acknowledgement Plugin for the Alarms and Alerts System

Duration: May 2025 - August 2025 (12 weeks)

Project Description:

Research and Education (R&E) networks form the essential infrastructure for supporting the global scientific enterprise, connecting hundreds of institutions and facilitating massive data movement across continents. Tools such as perfSONAR and pSDash are central to monitoring and diagnosing issues in these complex networks.

The Alarms and Alerts system aggregates millions of measurements daily, generating alerts when anomalies are detected. However, in the current infrastructure, once alarms are generated, there is limited capability for administrators or scientists to acknowledge and track the status of these issues systematically.

The goal of this project is to improve the management and visibility of network alarms by implementing a structured Acknowledgement System for the Alarms and Alerts platform. Administrators will be able to signal that they are actively investigating a reported problem, providing better insight into incident response efforts, and reducing redundant investigations.

This work will directly enhance the operational reliability of the WLCG, HEP, and broader OSG infrastructures, ensuring researchers worldwide experience fewer disruptions.

Project Goals:

Implement Alarm Acknowledgement: Develop backend logic and frontend integration for allowing users to acknowledge active alarms, changing their status and adding optional metadata (e.g., "Under investigation", "Work in progress").

Expand Alarm Types: Create additional alarms targeting new types of network degradation patterns if time allows.

Improve Usability: Ensure the acknowledgment system is simple, intuitive, and efficient for

administrators operating under real-world pressures.

Enhance Monitoring Infrastructure: Contribute to making WLCG and affiliated networks more resilient by reducing response times to detected issues.

Proposed Timeline:

Week 1 - 2:

- Study the existing Alarm and Alert Service framework and frontend.
- Familiarize with the APIs and backend structure.
- Understand current data flows through ElasticSearch and pSDash.

Week 3 - 5:

- Design the acknowledgment feature structure (frontend changes and backend API endpoints).
- Begin backend implementation: add database fields and REST endpoints for tracking acknowledgment.

Week 6 - 8:

- Implement frontend features (e.g., acknowledgment button, status display).
- Integrate front-end changes with backend logic.
- Test feature locally using Postman API and frontend testing environments.

Week 9 - 10:

- Explore addition of new alarms for specific network metrics if timeline permits.
- Integrate, test, and document additional alarms.
- Conduct user-testing simulations to validate usability of the acknowledgment system.

Week 11 - 12:

- Conduct user-testing simulations to validate usability of the acknowledgment system.
- Fix bugs and polish user interface components based on feedback.
- Final testing and deployment readiness.
- Document the codebase changes and create a user manual for the new acknowledgment functionality.

Learning Experience:

Through this project, I will gain hands-on experience with integrating new features into a production-level system, managing full-stack development tasks, and applying network measurement data toward real-world operational improvements. Working under the mentorship of experienced developers, I will sharpen my problem-solving, software integration, and system debugging skills in a high-impact scientific environment.

References:

https://aaas.atlas-ml.org/
https://github.com/ATLAS-Analytics/AlarmAlertServiceFrontend
https://ps-dash.uc.ssl-hep.org/
https://www.perfsonar.net/