Abstract

ATOS has requested a data analytics dashboard to monitor and alert clients of data collected by industrial electrical sensors. The collected sensor data is preprocessed by an advanced analytics server database and sent to the server to be displayed for the end user.

Our project involved building a dashboard that allows clients to easily view information originating from a number of devices without requiring the user to directly access each device individually. Additionally, the dashboard has been created in such a way to allow user to select a desired date range to display useful data to aid in identifying point of failures, performance issues, etc.

The dashboard is secured by forced 2-factor authentication and limited whitelist-based registration. The administrators have full control on who can access the site, and users will have forced secondary security before viewing potentially sensitive data.

Architecture

The final product for this iteration is able to display the information effectively. The graph above is created using artificial data points, but does show how the user will view the information.

- Customizable
  - Frameworks used in web server allow for future extension, configuration for client requirements.
- Intuitive
  - Clients can navigate/filter to a set of devices via interactable maps rather than manually filtering up to hundreds of devices.
- Clear graphs and gauges makes it easy to know when issues are present
- Secure
  - By enforcing two-factor authentication, the risk of a security breach is greatly reduced.

Impact

Our application enables users with access to view sensor information on a graph. The displayed data is obtained from numerous devices and can represent any measurable data. The ability to see one series of information on top of another series can provide critical information about system reliability, performance, and critical failures.

Predictability
- Device data analysis allows clients to take preemptive action against a failing or underperforming device

Accessibility
- Delivered as a web tool, the dashboard can be accessed remotely anywhere saving costs in frequent manual inspections

Adaptability
- Not limited to a single device type

Results

The graph above is created using artificial data points, but does show how the user will view the information.

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Summary

During the semester, our team worked with ATOS to develop a dashboard to display information from several machines.

Our dashboard had a few shortcomings. The biggest problem our group faced was finding an effective solution to deal with the massive amount of data points that the system had to access. We have concluded that to keep the functionality of the application, the use of cloud computing would be needed to reduce the load on the computer.

Our development process was iterative and success was defined by meeting weekly project goals. The goals, set each week by our corporate sponsor, were met and the product delivered at the end of the development cycle will provide a solid foundation for future development work.

We would like to thank Dr. Cankaya, our faculty advisor, and Josh Reeves, our company sponsors, for their guidance and expertise during the project.