Project Background

Qualcomm is the connected processor company for the intelligent edge with leadership in wireless connectivity, RF front-end, high-performance, low-power computing, multimedia, and on-device intelligence. Within the Test Base Station Project we design internal custom, integrated cellular call flow test boxes that rival or exceed capabilities of external third-party solutions. The project has over 200 Engineers worldwide and has deployed over $200 million of equipment for 5G wireless verification. The team supports a product portfolio that includes 3G, 4G, 5G, and V2X products.

Customer support is provided to this product portfolio of over 2000 systems leveraged on a daily basis throughout the global company.

One of the challenges of customer support is to quickly identify the root cause of the issues reported by the users and provide effective solutions. This can be difficult when dealing with complex systems that generate large amounts of log data. To address this challenge, the TBS team has developed an internal tool LogAn (Log Analyzer) that processes log files to diagnose problems and guide the engineer handling the support ticket. LogAn is implemented in Python and uses Python libraries such as Pandas, Bokeh etc. to analyze the log files, extract relevant information, visualize the outputs, and suggest possible actions. By using LogAn, the TBS team can reduce the time and effort required for troubleshooting, improve the quality of customer support, and enhance user satisfaction.

LogAn GUI's front end is an Electron, TypeScript, ReactJS application that runs the LogAn analyzer on Windows. It uses HTTP/FastAPI for front-end and back-end interaction and can download and analyze logs from the cloud. LogAn GUI was developed by students at Colorado School of Mines in Fall 2024.

Project Description

The LogAn GUI requires improvement in terms of reporting and visualization capabilities. The following enhancements are needed for the GUI application.

- Interactive tables: filter data, hide columns, format concisely, expand output, color-code cells.
- Interactive chart visualization based on data from various analyzers.
- Highlight key analysis and navigate details.

LogAn analyzers keep analyzed data as Pandas Dataframes in the backend. It needs to be sent to client application in an efficient manner. GUI may need to stitch multiple analyzer outputs in user friendly way.

The product operates on Windows 11. Development is conducted on Windows. Code repositories are hosted on a local GitHub server.

Development should adhere to best practices, including writing unit tests, following industry coding standards, and suitable internal packaging. Qualcomm uses Gen AI tools for code generation, unit tests, and documentation that improves developer productivity. Developer cycles are coordinated with the Qualcomm team leveraging software sprints and progress tracked in JIRA.

The chosen team will collaborate extensively with Qualcomm Engineers in the Boulder office and at various other sites. The team will review existing documentation to understand the tool, its functionality and APIs. To facilitate support, the team will learn the previous processes for downloading the logs, reviewing them, and use their experiences to improve the functionality of the tool at the direction of the Qualcomm team. Subsequently, they should coordinate with Qualcomm Engineers to establish the scope, outcomes, and timeline. Furthermore, the team is expected to submit a High-Level Design document detailing their approach before starting the development phase. They should suggest suitable technologies for the project's execution. The final product developed must be complete with all features and ready for immediate use by Qualcomm personnel.

Desired Skill Set

- Web Interface Design Experience
- Python3 and TypeScript programming experience.
- Electron, ReactJS, Pandas, FastAPI knowledge/experience or desire to learn.
- Familiarity with git and working in github environment.

Preferred Team Size

Initiating with three people is ideal. Availability of additional resources would allow us to broaden the project's reach.

Location

The Qualcomm TBS project will provide support mostly locally from the Qualcomm Boulder and Bridgewater NJ office. Remote work is the expectation with possibilities of on-site for key needs or discussions.

Resources

Qualcomm intends to open a remote development environment with sufficient compute and virtual desktop portables for all required development.

Contact

Email Kevin Wolver at kwolver@qti.qualcomm.com for high level project questions. If selected, other engineers will be made available for guidance, leadership, and mentoring.

Background

TBS = Test Base Station