

Saunders, Jerren

Systems Software Developer II

Manager: Karen [REDACTED]

Evaluated By: Karen [REDACTED]

## FY'20 Year-End Performance review (1-Mar-2019 - 29-Feb-2020)

Organization: QNX Wireless Framework (Karen [REDACTED])

Location: Cary, CG2

03/01/2019 - 02/29/2020

### Overall

#### Manager Overall Evaluation

Rating: Fully Meets Expectations

### Goals

### Performance Evaluation Questions

#### Highlight Key Accomplishments/Achievements:

##### Manager Evaluation

Response: Jerren's work towards researching, designing, creating and rolling out the test results database and web dashboard has been very productive and thorough. There are many behind-the-scenes parts of the solution required to build a viable, robust, usable database and dashboard. Jerren's work has been central in bringing the solution to a level that makes it scalable and usable by all the various test teams. He has a keen ability to grasp the end to end design, implement and integrate the pieces, and test the resulting solution.

Going forward this year, I hope to gain a wider deployment of the test results dashboard, which will require more proactive sponsorship and communication on my part. I need to help clear the roadblocks and get the whole test team on board. I'm very pleased that the database and dashboard solution are ready for wider deployment. This is due to strong progress made by Jerren throughout this last year.

Jerren has also provided wonderful coordination and mentorship towards the NC State Sr project teams. He has provided guidance and feedback in a constructive way towards the students, building a good relationship with NC State computer science

##### Employee Evaluation

Response: Another year has passed and a new chapter completed of continued adventures and the beginning of new ones. I have continued to be an integral part of the design, implementation and maintenance of the BlackFish Dashboard infrastructure. This past year, as the BlackFishDB system matured from the proof of concept stage to first generation production, we needed to move away from running the services on our desktops to using more robust systems. Early in the year, I retrofitted an old server that was left behind by a previous team in BlackBerry, to operate as our production server for the database, backend and frontend web services. This migration and upgrade of hardware not only provided several redundant safety-nets, but also gave the BlackFishDB system an performance boost of almost 85% in most operations.

In the development of BlackFishDB, our initial approach was to leverage the use of existing scripts and database available from the weekend regression test. This allowed the usage of existing tools to continue and allowed us to focus our efforts on improving the user experience, functionality available and reducing the time to rendering the reports. However, the import of the test results to the existing database required

department.

Jerren has also prepared the “[redacted] lab” for use this next year. He has diligently researched the needed hardware, shelving, cable management, power and networking requirements. It is very close to going live and it will definitely help distribute the work, freeing up space in Ottawa and enabling the local testers to be more efficient.

manual interaction by someone in Ottawa, which prevented us from automating the updating task on our end, and since changes to the parsing script were heavily restricted due to the rigidness of legacy scripts, the tools we developed were limited to only the information currently being scraped by another's script. A separate script was also required to extract benchmark metric test results, which took extra effort on our part as well as introduced complexity in the system that was error-prone. This extraction script was also very awkward and frequently broke, failing to extract the necessary information. Using the existing system gave us a jump start and allowed us to focus on just the front end interface for users, but we soon realized that with the limited information in the base and the inconsistent reliability, we needed to also spend some time improving the underlying backend. I created a new parsing script that would directly scrape the test output log files and import the information into our database. Not only does this script allow us to import results faster, but it has been designed to capture significantly more information about the host system, the target device under test and also the executed test than was done by previous script. This new script was also not only designed to work with Regression test, but also works with [redacted] Metric tests, and with minor enhancements, and will work for parsing the [redacted] functional test logs that we plan to tackle soon, or any other log file generated by our DejaGnu test system.

With the new parsing script in place, I was not only able to capture the information we needed, but also put in features to detect previously unnoticed errors and scrape additional details from the test. One example: previously only one result could be captured for each test. Most test were written to work around this limitation, but required being run multiple times in order to cover all the test cases. This repeated execution causes significant overhead on the test system, reducing the number of test that could be performed in the allotted time. The one result per test limitation also meant that test which captured min, max, and average data points were limited to reporting

only the average results, potentially masking problems. With the parsing script I developed, a test could provide multiple metric points and these additional details were captured and made available to the reporting tool, all without having to change the existing tests. This flexibility will allow future test to be written so that they can be executed faster, as well as provide higher resolution of the operation so that the performance can be tracked closer and problems identified quicker.

Together M█████ and I created several web-based tools to visualize the Weekend Regression and █████ Benchmark test results in a way that allowed users to dynamically create reports between various test runs and highlights test that significantly improved or degraded. The process before required hours each week of collecting test results into a spreadsheet just to compare the latest run against the previous week's run; any other comparison combination required additional hours of exertion - all with their own risk of human errors while copying and pasting the test results between spreadsheet and adjusting formulas. With this web tool we've developed, the users can select any combination of test runs to compare. The results are loaded within seconds, calculations performed, and highlighting of outliers automatically applied to the rendered table and charts. With this speed, not only can more permutations of reports be generated to compare against a previous run, "golden" build, and different branches, hardware and variants, but many runs can be loaded to visualize trends and also analysis of the results can be done within seconds. This allows the detection of trend patterns for specific metrics that have been slowly deteriorating over several software iterations and likely went unnoticed for a long time with the previous methods. During the development of these tools, we've also uncovered several mistakes that occurred in the past with the data, resulting in false and missed information which delayed detection of, masked problems, or wasted time investigation a problem that didn't actually exists. By automating this work, we hopefully have reduced the number

of these human errors and alleviated the collection process so that developers and managers can use their time elsewhere.

In a parallel project this past year, M█ and I have spearheaded the procurement of equipment needed to setup a █ Lab clone at our site. The work entailed wasn't simply putting together a shopping list, but also required education ourselves in setting up servers and VMs, researching protocols and procuring equipment for controlling development boards, and working with the purchasing department and various vendors to order the equipment needed. M█ and I have collected requirements from D█ and J█ to also setup similar benches for the WiFi test to better utilize their lab area to support additional customer equipment. The process to procure all of the equipment took longer than expected, and the window of where we were able to work on setting up everything was cut short by higher priority task that occurred. During the procurement stage, I was able to locate and setup a server to act as our Z█ replacement, as well as serve several other roles for testing and automation. I also created an interface that would allow existing test scripts to replace their dependency on aging and failing █ power distribution units that are out of production with PDUs from other vendors. Using concepts learned during the development of BlackFishDB, our test scripts can now be modified with minimal efforts to use this new interface which uses an industry standard protocol to communicate with and control PDUs from a variety of manufacturers. This means that we are no longer restricted to a specific vendor or legacy hardware, but instead can purchase the ideal or most cost-effective equipment needed for the task without having to update hundreds of test cases each time.

Along with M█, I have also continued to work with senior design teams at North Carolina State University each semester. Working with these students, we have been able to use them in developing features of the BlackFish Dashboard web application to help with future expansion and easier implementation of future tools, allowing

M [REDACTED] and I to focus on rapid deployment of tools utilizing the product of their work. We have also been able to use these teams to create features that improve the user experience of the dashboard tools.

Highlight areas where company values have been demonstrated. Share specific examples about how the goals were achieved in a way that supported the BlackBerry values of Customer Focus, Innovation, Integrity, Team Work, Mutual Respect and Accountability:

#### Manager Evaluation

Response: Jerren demonstrates strong teamworking by continuously considering how the team can be more effective and efficient with their tooling and daily work methods. Jerren has a can-do attitude which together with a good sense of accountability, allows him to make progress against tooling objectives, which are admittedly sometimes vague. However, Jerren pursues clarifications and works to find a solid direction. Jerren respects everyone he interacts with, and strives to meet the expectations from his customers, ie other members of the development and test teams.

#### Employee Evaluation

Response: My customers are my co-workers. I have continued filling the role of being the local hands for IT, assisting coworkers with troubleshooting their PCs and other equipment, as well as replacing, verifying and configuring equipment in the server room. This past year, I have also helped co-workers by creating parsing scripts to help track down patterns in log files to help determine the root cause for hard to find bugs. In one particular case, it was discovered that a particular core dump pattern had been occurring in certain situations, but it was unknown how far back the problem started, which made it difficult for the developer to identify the root cause, how to fix and which branches the fix needed to be applied. When I was approached with the task, others were manually scrolling through old log files, picking at random, trying to find when the particular problem had occurred, which was like looking for the proverbial needle in a haystack and would take days, if not weeks to locate. Within 48 hours of learning the details, I was able to create a script that parsed through 363,077 test of a weekend regression in 30 minutes, detecting 155 occurrences of the specific pattern. I was then able to set the script to scan across many previous weekend regression runs, inspecting millions of test, and was able to provide the investigation team with a list of the exact locations of the specific [REDACTED] [REDACTED] problem being inspected. I was also able to use features we had added in BlackFish to provide them with a hyperlink that would load the particular log snippet of the test in question within their web browser, saving them the time of having to navigate

to, download, decompress and open and scroll through the log file on their local machine.

It is my ambition to optimize processes and develop tools that make jobs of my coworkers more streamline and efficient. Sometimes this comes with resistance, especially if the proposal requires a paradigm shift from the "old ways". In my work, I do my best to balance optimization along with supporting legacy task and methods to ease the transition towards new tools. My goal with the development of the tools available in BlackFish have been to reduce the number of potential mistakes made while aggregating data, and also to automate as much of the task as possible so that we can focus our efforts on identifying and fixing problems as quickly as possible instead of back pedaling and hunting them down.

## Highlight areas of improvement required in the current role:

### Manager Evaluation

Response: Jerren pursues learning about the available technology options that can be used to develop and deploy test tools. I encourage Jerren to continue pursuing this knowledge and skill development.

### Employee Evaluation

Response: With the help of the North Carolina State University senior design team in the Spring of 2019, we moved our web dashboard from a very basic web server to a modern, high-level web development framework. This move required another step forward in my understanding of web development and learning how to development using the Angular framework. Last year, I was a rookie in web development. While I still have a lot to learn, I have gained a good understanding of Angular this past year, and with that knowledge, have been able to make improvements to the code delivered by the students. A major release of Angular occurs each year, keeping me on my toes and requiring me to continue educating myself about the latest techniques of web development.  
As I studied and learned more about the framework used by the students in the Spring semester, I saw potential scaling problems with their implementation. After some research, I found a potential solution to the problem and we challenged and worked with the team in the Fall semester to

improve the prior work and successfully implemented this modular concept. My skill growth in these areas has helped me to not only become quicker at developing tools and scripts to help my fellow colleagues, but also at taking more inventive approaches to solving the tasks at hand.

## Highlight areas that can support you in your career development (12 - 18 months):

### Manager Evaluation

Response: I would encourage Jerren to figure out a good focus area and pursue that. The scope of test automation can be very large, and a divide and conquer approach would be best. Let's talk further.

### Employee Evaluation

Response: I still see a lot of potential for making improvement in our testing methods. We have made significant progress, especially in the benchmark metric test, this past year. Now that we have received the equipment to setup █Lab here in Cary, I hope that we can continue to make great strides in automating more test and optimizing our testing efforts. In order to accomplish this, I need to continue to educate myself about our current methods and platforms used for testing. Before improvements can be made, a thorough familiarity of the current system needs to be understood. There is a lot more about the █Lab eco-system that I need to learn about, as well as learning about setting up and maintaining virtual machines to duplicate the systems used.

The BlackFish Dashboard web system has most of the underlying features in place now, so we should be able to collect test results from more groups and provide tools to help visualize and compare this information. But the web development world is a fast-paced, always evolving area and I need to continue to learn more and keep up with the latest techniques so that we can create and provide the best tools for our users.

## Section Summary

### Manager Evaluation

Comment: Jerren has a solid and flexible skillset. He is always willing to jump in and make progress against the objectives put in front of him. He is very collaborative and works to provide thoughtful and viable tooling solutions. His work is valued highly, and I'm happy to have him on the team. Nice work Jerren!

### Employee Evaluation

Comment: