

Question

This section should be used to highlight completed projects, Key Performance Indicator (KPIs), Measures of Performance (MOPs), significant work projects, metrics, and process improvements that contributed to the organization's goals. This section should not be used to summarize daily tasks. Focus on what was accomplished and how you exemplified BlackBerry's core values (Customer Focus, Innovation, Integrity, Team Work, Mutual Respect, Accountability).

Manager**Answer**

Jerren provided valuable contributions to the company in the area of test tools including Blackfish, Cary test lab operations, Cary site expansion, local IT support and ISO/TISAX audits. His work supported numerous test teams to capture and analyze test results, enabling [REDACTED] and [REDACTED] delivers on time with the right quality. Jerren has been instrumental in advancing the Blackfish system for wider adoption and use throughout the ~100 test team members. Jerern diligently pursues adding backend database features and addressing any databse performance concerns. I am interested to understand more about the "intentional test list" functionality. Do tell.

Jerren continues to serve as a "goto" resource for the Cary team, including building out lab benches, creating a new terminal server solution, helping with the BBMux hardware design, and mentoring new hire C [REDACTED].

Jerren is collaborative with his colleagues, responsive to feature requests and accountable towards his assignments, even when managing multiple, unrelated work tasks. Jerren's work at implementing test improvement initiatives is very important to the company. There is no way to achieve the company ambition without also improving productivity and efficiency of our test frameworks, test automation and test result processing.

Employee**Answer**

2022 was a year of growth and improvements on many fronts.

This year, the BlackFish project has moved into a phase of onboarding several different groups to upload their test results. BlackFish was originally conceived from the need to review and manage the large volume of tests that are run each week across the organization. It has grown into a tool that allows users to quickly identify and investigate areas of concern and normalizes the way we store our test results. This allows us to concentrate efforts and create tools that can be shared across the teams instead of each area creating their unique solutions.

The BlackFish project helps accomplish many items in the Process Improvements goal set for this fiscal year. Previous methods used for analyzing test results by various teams were a mixture of manual, piecewise, and tedious processes and they conflicted with requirements of verifiable traceability between the test execution and the reports. These are things that BlackFish are helping to accomplish and solve in the process. The efforts being taken to normalize the test results for storing in BlackFish are paving the way for the different test teams to adopt and take advantage of a common set of tools. Focusing development efforts on a common toolset will allow time to create more advanced functionality in our tools. These tools will help consume the vast number of test results, filtering out the noise so that developers can quickly triage areas of concern, investigate problems and find the root cause. We have been working on many different pieces of the puzzle to improve these tasks, and the pieces are starting to join together. As the features available in BlackFish become more utilized across the other test

teams, the quality and testware improvements will become even more realized. As BlackFish continues to grow and implement more of its planned features, we continue to progress on the goals of testware improvements and efficiency to get closer to continuous testing capabilities. Reaching that goal will enable us to identify problems quicker and address them earlier in the development cycle.

We've been working closely with a few test groups to collect requirements and build a framework that will accommodate the various test areas within QNX. Now that the groundwork has been established, this past fall we demonstrated the capabilities of the tool to a wider audience in QNX and have begun to work with several different test teams to normalize their test results and store them in BlackFish. Five different test areas have gone through the effort of parsing their test results and uploading them to BlackFish - though some are utilizing the tool more than others. Four other test teams have started the preliminary work of communicating with BlackFish's REST API. They are researching the information that needs to be collected for our schema and are at various stages of creating a script to convert their current test result output into the schema needed for storing in BlackFish.

The information collected by BlackFish also contributes to the process improvement goal of being able to generate service test estimate cost. By aggregating the metrics stored in the test results, we can build up a profile of the amount of time it has taken to execute tests in the past and use this information to provide more accurate estimates in the future.

Due to the sheer number of tests we have built up over the decades, it would take many days to run all of the regression tests against the kernel. Since the target development boards are limited and valuable resources, the testing is typically done between Friday afternoon and Monday morning. Since all tests can't be run during this window, a fixed list of tests is run each weekend, then the rest are filled in from randomly selected tests. This strategy has the potential for some tests to never be selected and executed or at least not be run frequently enough to detect a problem early. We have added functionality in BlackFish that enables building a test list that is more intentional in selecting tests that have not been run recently so that we have more complete and consistent coverage. It also allows us to become more efficient in utilizing our resources.

A few features that were added to BlackFish this past year which made significant impacts on the analysis of the test results have included:

- Support for tracking Signature "Anomalies" detected by [REDACTED] Regression test
- Navigating, viewing, and syntax highlighting of test log file snippets
- A tool to help auto-generate details included in weekly reports
- Migration to auto-generated API documentation

The signature tracking capabilities enable the [REDACTED] Regression team (and any others that want to implement similar functionality in their parsers) to programmatically identify problems in the test log output files. These are automatically marked in the BlackFish test result documents so when a report is generated, it can include sections that highlight those which are new and need to be investigated.

BlackFish integrates these signatures with their related JIRA issues and reduces the manual efforts needed to collect them for the weekly report.

The functionality of the test log file viewer may seem trivial at first glance, but the features it provides drastically reduce the time for those manually investigating a test failure. Many of the raw text log files produced during test runs are so large that simply opening them in text editors to view is slow and challenging for the computer. With the log viewing tool that was implemented in BlackFish, we not only allow the log files to be compressed (thereby reducing storage cost), but by simply clicking a hyperlink in the web tools, the corresponding log file is retrieved from the network, decompressed, and the relevant lines for the test case execution are loaded into the user's browser, and custom syntax highlighting rules

applied to quickly mark the Test Point sections and DejaGNU states in the log lines. Instead of having to perform these steps manually and navigate through hundreds of thousands of lines, which would take several minutes for each test failure, the Log Viewer tool performs the task in a few seconds. This time savings allows users to focus on the actual problem while triaging failures instead of wasting time with mundane, slow steps.

The Reporting Tool being developed in BlackFish is another piece of the puzzle that demonstrates the usefulness of normalizing test results. This tool is still in its infancy but allows test teams to automatically aggregate the results of a test run into a report template that can be used to report the current health status of a certain test area. This process which previously took several hours to assemble can now be done in seconds.

As more teams are beginning to interact with the BlackFish REST API to upload and retrieve test results, it became challenging to keep the API documentation on the wiki synchronized with the versions available on the different BlackFish servers (production, stage, and test). To ease the confusion of users, I have started to migrate the documentation of the REST API to be done in the source code and use a tool to auto-generate it into an HTML page on the REST API server. This solution makes it not only easier to update the documentation but also allows users to quickly determine what REST APIs are available on the server and removes the problem of stale information in the documentation.

My contributions to the BlackFish project have also indirectly helped the company accomplish the items listed in the Revenue goal. BlackFish allows the test team to more efficiently track the test results against our product and ensure that we deliver quality work to our customers.

Outside of the BlackFish project, other tasks I have worked on in the past year toward the goal of process improvements can be found in my efforts with the infrastructure of the test racks. This past year, I headed up the effort to procure, assemble, and maintain another five test racks at our site - almost doubling our previous capacity. The current global supply chain issues brought unique challenges this time but were resolved. The additional TISAX requirements we needed to fulfill also added another layer of complexity on top of those from ISO and ESD requirements - those also were addressed and we successfully passed all audits.

Working with others on the local test team, I was able to help investigate and build an alternative terminal server solution. This new setup is an order of magnitude cheaper than the previous L [REDACTED] solution and provides additional features and interaction with devices under test that the test team can leverage when creating future test cases.

The test racks have continued to help us improve the utilization and efficiency of our test devices. Without these racks and their supporting infrastructure, the last few years of remote and hybrid work environments would have been significantly more challenging for the test team. They are also vital to reach the goal of being able to reach automated continuous testing capabilities.

Another area I have contributed to concerning improving our process and testing has been in my work with M [REDACTED] on the new BB Mux board. The USB test team is working with old, failing devices that were made when BlackBerry created its own hardware, but are vital to automating USB tests. I have been working with M [REDACTED] to help design and create a new BBMux board that addresses limitations with the previous design, adds new functionality, and supports newer USB protocols that have been released since the previous hardware design. My contributions to this project so far have included:

- Help with the design and planning of features that will be implemented
- Researching and narrowing down components to use
- Selection of the microcontroller that will be used to provide an interface and control the

board

- Initial development of the firmware and proof of concept for USB, command line, and REST API for the board
- Researched the resources to produce an enclosure for the product
- The mapping of the microcontroller pins to the controls of various components on the board
- Reviewing the schematics and PCB component layouts and connections

Some of my efforts towards this year's goal of Execution include my contributions to preparing for the external TISAX audit and the ISO internal audit. This year was the first time our site has gone through the TISAX audit and required coming up with a few solutions that bridged our local test environment setup with the requirements for TISAX compliance. Through a team effort, we were able to successfully comply with the TISAX requirements at our site. I have also taken some of the recommendations and observations that were raised from the audit to the team responsible for building out our future office location so that it will be easier for us to comply during the next TISAX audit.

The request from existing and new QNX customers is quickly piling up work for our business unit. This expanding workload is driving the expansion of our team and the goal of recruiting and onboarding. I have reviewed several resumes this year and participated in interviews for three positions. Out of those interviews, three offers were extended to the candidates and two were accepted. I have worked with A [REDACTED] to enable him to build a PyTest library that eases the ability for Python scripts to upload test results to BlackFish. I have been assigned the task of being an onboarding buddy for C [REDACTED] and will be mentoring her so that she can quickly ramp up and begin contributing to the BlackFish project and adjust to the BlackBerry Company culture. I have also helped R [REDACTED] during his onboarding phase, to educate him on various aspects of our test equipment and infrastructure.

The growth phase we're going through not only encompasses new hires but also includes our move to a newer, larger office located next door. Over the past few months, I have worked closely with several different teams, both within BlackBerry and external vendors, who are working on the design and outfit of our new suite. I have worked with facilities, networking, security, and other groups to ensure that our new office location has the features we need in our cubes, software labs, and screen rooms. I have worked closely with D [REDACTED] and [REDACTED] to ensure the second shield room being acquired will fit into the new suite and has the options our team needs and the proper connections needed by IT to safely penetrate the chamber wall and provide network access. I have collected requirements from D [REDACTED], J [REDACTED], and other local stakeholders to relay to the facilities and network teams to ensure our labs will have the correct power and data connections and also ensure that we maintain our compliance with ISO, TISAX, ESD, and other requirements in our labs. I have also drawn up floor plans to plan furniture layouts in our labs and shield rooms. I also worked with the facilities team to modify the original plans and relocated the battery backup unit in a way that enabled it to support not only our primary software lab but also both RF chambers. I have been attending the weekly meetings to make sure that our requests are lifted to the decision-makers and also so that we remain up to date with the latest details in the process. I am also a local contact for the [REDACTED] vendor (cabling contractor) team.

We are not only expanding our local office, but QNX has plans to establish new sites in Germany and India to help distribute the new workload. I have been working to create a document that outlines the components of our test infrastructure so that the test teams at these new sites can source local equivalent equipment and quickly assemble what they need to set up their local test labs.

Question

This section is for identifying opportunities for growth and development to help reach an increased level of performance or step in career. Briefly describe 3-5 areas of opportunity and/or improvements.

Manager**Answer**

I fully appreciate the opportunities outlined by Jerren, and applaud him for stepping into the void left by E█. Let's talk about Jerren's most preferred work areas, because there is too much listed for one person. And we have headcount to hire additional help. I suggest it is better to focus on fewer areas in order to make a bigger impact. that is, once we find additional help (which I am actively working on!).

Employee**Answer**

My favorite part of my job is designing and providing solutions that optimize tasks and allow others to become more efficient in their work. I want to continue the efforts to make improvements in our testing process. We can make improvements to the way we select and execute test cases so that we can focus test efforts and maximize the utilization of our development boards. We can continue to make improvements in how we collect, monitor, and review test results. With the recent addition of C█ to our team, hopefully we can begin to tackle the backlog of features that have been planned for BlackFish and get closer to targeted and continuous automated testing that will contribute to improving the quality of our product.

Once we receive the initial prototype board for the new BBMux, I will need to continue learning the MicroPython language and also refresh my skills in working with embedded systems. The successful development of this hardware will not only aid the USB test team in their efforts but will also help establish a framework that can hopefully be re-used to develop other hardware that has been discussed in the past which is needed to automate some manual test cases.

As our team continues to grow both locally and internationally, collaboration is going to become even more important. Mentoring and training C█ on the inner workings of BlackFish and integrating her into our team is an immediate priority. This onboarding means our requirements, documentation and general processes need to be reviewed and communicated. Helping to document our test processes and solutions to aid in establishing the new sites in Germany and India are also vital efforts that need to be tackled in the upcoming months.

I also want to continue refining my skills and knowledge of our tools and solutions. MongoDB, Angular, and Node.js continually release updates that introduce new features and techniques. By keeping up to date with these releases, we can continue to incorporate them into optimizing BlackFish and using them to improve our tools and processes in testing. I also hope to learn more about solutions that are being used by the various test teams across QNX so that efforts to combine these techniques can be made when appropriate to reduce redundant efforts to solve the same or similar tasks. My goal is to reach out to become educated in these solutions, and hopefully establish and improve relationships. If we can improve collaboration across teams, I believe that we will be able to form a synergy that will help us make significant strides toward improving our testing processes.

I also hope to continue expanding my knowledge around some of the tasks that need to be picked up since E█ departed. I have been able to absorb some of his responsibilities of maintaining various systems used by the test team, but there are a few areas where my knowledge is currently insufficient. Specifically, I need to become more knowledgeable on Hypervisor and Virtual Machine configuration and management, as well as become more familiar with Linux OS configuration, routing tables, and PXE network booting. The most challenging part of acquiring these skills has been trying to find the time in my schedule. Hopefully, after we move to the new office and C█ has ramped up on BlackFish, I

will have more time to train in these areas, or we will have successfully backfilled E█'s position.

Question

This section is for sharing employee career aspirations and the skills and experience that could support these development goals for the upcoming year.

Manager**Answer**

Let's discuss what is of most interest to Jerren to support future career growth.

Employee**Answer**

As stated earlier, the motivation behind most of my work is to find ways to improve the efficiency of my colleagues' work and to build systems that help them accomplish their tasks. By continuing to learn about various solutions, tools, and newly available features, I can continue to apply my knowledge in designing and developing tools and features to accomplish those goals. Since I work in many different roles in my day-to-day work at BlackBerry, there are many different areas that I can continue to expand my knowledge in:

- * Full Stack Developer
- * MongoDB
 - * Database management and configuration
 - * Database index optimization
 - * Data Replication
 - * Authentication and Security
 - * Database query and aggregation optimization
- * HTTP (NGINX) Server Configuration
 - * Load Balancing & Redundancy
 - * TLS/SSL security certificates
- * Backend REST API development
 - * Javascript and Node.js programming and design
- * Frontend (Angular) development
 - * User Interface design
 - * Large Data Analysis
 - * Typescript programming design
- |
- * Project Management
 - * Git Lab Process
 - * JIRA Issues
 - * Source Version Control Repository Management (branching strategy, merge request, configuration, etc)
- |
- * Server Hardware Configuration and Maintenance
 - * Various network communication protocols
 - * Managing and maintaining hardware
 - * Firmware updates
 - * RAID Controllers and Configuration

- * Embedded Design
- * MicroPython
- * USB & Serial Command interface
- * Ethernet, REST API, and embedded web server

Manager Summary

Comment

Jerren is a critical member of the Cary team and overall QNX test team. He takes on many challenging and diverse tasks and produces successful results. His work is important to support the Cary team and ensure the test team is ready to handle future workload. It is a pleasure to have Jerren on the team and I look forward to FY24!

Employee Summary

Comment

As part of putting together this performance review, I reviewed my work journal entries from the past year and put together an outline of actions and accomplishments. Most are mentioned in the previous sections, but instead of repeating and summarizing here, the outline provides a good summary:

Test

- Maintain equipment on Test racks:
 - Perform firmware updates of components in the test rack setup
 - Replacing UPS batteries
 - Helped troubleshoot problems with [REDACTED] terminal servers used by the local test team
 - Helped troubleshoot USB connection issues with dev boards
 - With the help of others, came up with a setup that allows a Raspberry Pi (or any Linux computer) to be used as a terminal server on the test racks that can support 26 devices.
 - This setup is equivalent to the [REDACTED] console server, but the total cost is around \$300 per setup instead of \$5K
 - This setup also gives us the ability to have more control over development boards
- Taken on responsibilities to maintain server hardware that E█ oversaw
 - Repair RAID drives
 - Apply updates and security patches on devices and servers
 - Learning how to configure VMs, etc
 - Learning HyperV setup and configuration for the new HP server to host BlackFish
 - Troubleshooting and updating various servers
- Built 5 more test racks for the local team this year
 - Procuring parts
 - Assembly
 - ESD-safety compliance
 - Configuring of PDUs, terminal servers, and other equipment
 - Working with IT to procure, install and configure network switches
 - Cable Management: Creating and installing

BlackFish

- Migrating BlackFish REST API documentation to being auto-generated from the code (APIDocs)
- Continued to build up test cases for BlackFish REST API - Now over 1200 test cases
- Started initiative to implement test framework for the Frontend

- Responsible for updating, maintaining, and configuring the BlackFish server:
 - Frontend (NGINX): three server instances (production, stage, and test)
 - Backend (Node.js)
 - Routinely monitor and update 3rd party Node modules dependencies
 - BlackFish repo and branch management
 - MongoDB
 - Configuration and Database Backups
 - TLS/SSL Certificates
 - Setup new server hardware
- Added syntax highlighting to the BlackFish log viewer tool to help markup yoyo log files and test point prints
 - Redesigned, optimized, and integrated Log Viewer Tool
 - Each test area that uploads results to BlackFish needs assistance to fit its data into the BlackFish schema
 - So far, the BlackFish schema design is holding solid, and all teams have been able to fit their results in
 - Have worked with the following test areas to get their data into BlackFish
 - [REDACTED] Regression
 - [REDACTED] Benchmark
 - CLT [REDACTED]
 - WiFi
 - USB
 - Preliminary work done with the following teams to get their data into BlackFish
 - [REDACTED]
 - H [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - Worked with each test area to provide a solution quickly to add their results into BlackFish
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - Optimizations
 - KR team mentioned a certain process in BlackFish was "running slow but this is not slowing me down in any way. Just letting you know about the upload performance as I see it."
 - Investigated, found the problem, researched how to resolve and optimize it, and then provided a solution.
 - By educating myself more on the features and configuration of MongoDB, I was able to reduce the action from 45+ seconds (per request) to executing it in less than 0.5 seconds.
 - Presentation of web tool features to test teams
 - Process: Continuing to improve the way the BlackFish project uses our tools
 - GitLab
 - GitLab Merge Request Templates
 - Manage source code repositories for BlackFish
 - JIRA Tickets: Push effort to use JIRA for issue tracking in the BlackFish project

Audits

- Helped with preparing for TISAX Audit
- Part of the team to perform our local ISO site audits
 - Inspected several of the test racks for compliance
 - Inspected half of the team's desk "labs"

IT

- Continue to be IT and Security Group's local hands
 - Working with IT to re-instate a lab/test subnet at our site

- Replaced many switches at our site as part of an IT hardware update
- Investigating hardware resets and power outages
- Tracking down rogue DHCP servers on the network

Expanding Team

- Part of several interviews: [REDACTED], [REDACTED] backfill, [REDACTED]
 - Helped with training [REDACTED]
- Drafting a document with details on our test rack setup for new sites in Germany and India
 - Discussions started with [REDACTED] to share details about our different setups and solutions
 - By getting familiar with different solutions in use, we can:
 - Document them to help the new sites ramp up quickly
 - Collaborate to combine solutions into a common super-set
 - Reduce cost, reduce maintenance and overhead

BBMux Board

- Helped research components to use
- Offered design suggestions with layout and routing in the PCB
- Helped investigate details of the selected components and how to properly connect them
- Learned MicroPython and Raspberry Pico + W5500 ethernet
 - Created proof of concept application with the Wiznet dev board
 - CLI + REST API + Web Server
- Researched options for enclosure
- Helped map connections between the pico microcontroller GPIO and various components on the board
- Review of design schematics

Site Move

- Have been one of the local contacts to drive and ensure our team's needs are met
- Worked with various teams in BlackBerry to plan the site
- Worked with facilities to modify the proposed floor plan
 - Offered a solution that allowed battery backup for the SW Lab and both the existing and new shield room
 - New location recovered valuable space in the SW lab
- Worked with D[REDACTED] and [REDACTED] to ensure the new shield room maximizes the available space and has all the features we need
 - Caught several mistakes in the various quotes from [REDACTED] and had them corrected
- Drew up floor plans for the SW lab and RF chamber layout
- Working with D[REDACTED] and Network team to ensure the networking design of the new suite will support the unique test environment requirements