NORTHWEST NAZARENE UNIVERSITY

Fatbeam Customer Portal

THESIS

Submitted to the Department of Computer Science

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Michael Smith

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By

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The Fatbeam Customer Portal

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ABSTRACT

The Fatbeam Customer Portal

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Currently, individuals on the client side must contact the Networks Operations Center (NOC) to determine their circuit's bandwidth usage. A prime example is a local university that cannot ascertain their students' bandwidth consumption compared to their labs through certain VLANS and circuits provided by Fatbeam.

This leads to another issue where clients often assume they're not receiving the contracted service due to speed decline during peak hours. To address this, this proposal was for creating an online portal that retrieves graphs from our online monitoring system in real-time and offers it to our customers.

The online portal was coded and implemented during the summer and fall, respectively, and has been immensely successful. It has saved the NOC considerable resources and time while improving customer satisfaction. Now, there is greater transparency with every circuit leased by Fatbeam to commercial institutions.

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Introduction

Clients of Fatbeam have been facing challenges with determining their circuits bandwidth usage, resulting in issues such as difficulty ascertaining the bandwidth consumption of students and an assumption of not receiving the contracted services during peak hours. The current approach requires clients to contact the Network Operations Center (NOC) to determine their circuit's bandwidth usage, which leads to clients assuming that they are not receiving the contracted service due to speed decline during peak hours. To address this, an online portal was proposed, which retrieves graphs from Fatbeam's online monitoring system in real-time and offers it to customers. The proposed solution aims to provide greater transparency with every circuit leased by Fatbeam to commercial institutions, resulting in improved customer satisfaction.

There is a body of literature on the topic of bandwidth usage monitoring and reporting, and various approaches have been proposed or implemented in the past. These approaches include network monitoring tools, such as NetFlow, SNMP, and RMON, as well as commercial tools and custom solutions. While these approaches have been effective to some extent, they have limitations that have not been adequately addressed. For example, network monitoring tools require expertise to operate, commercial tools can be costly, and custom solutions can be time consuming to develop and maintain. The current system Fatbeam uses is an online interface called PRTG (Paessler Router Traffic Grapher). The current PRTG layout is Figure 1 and 2

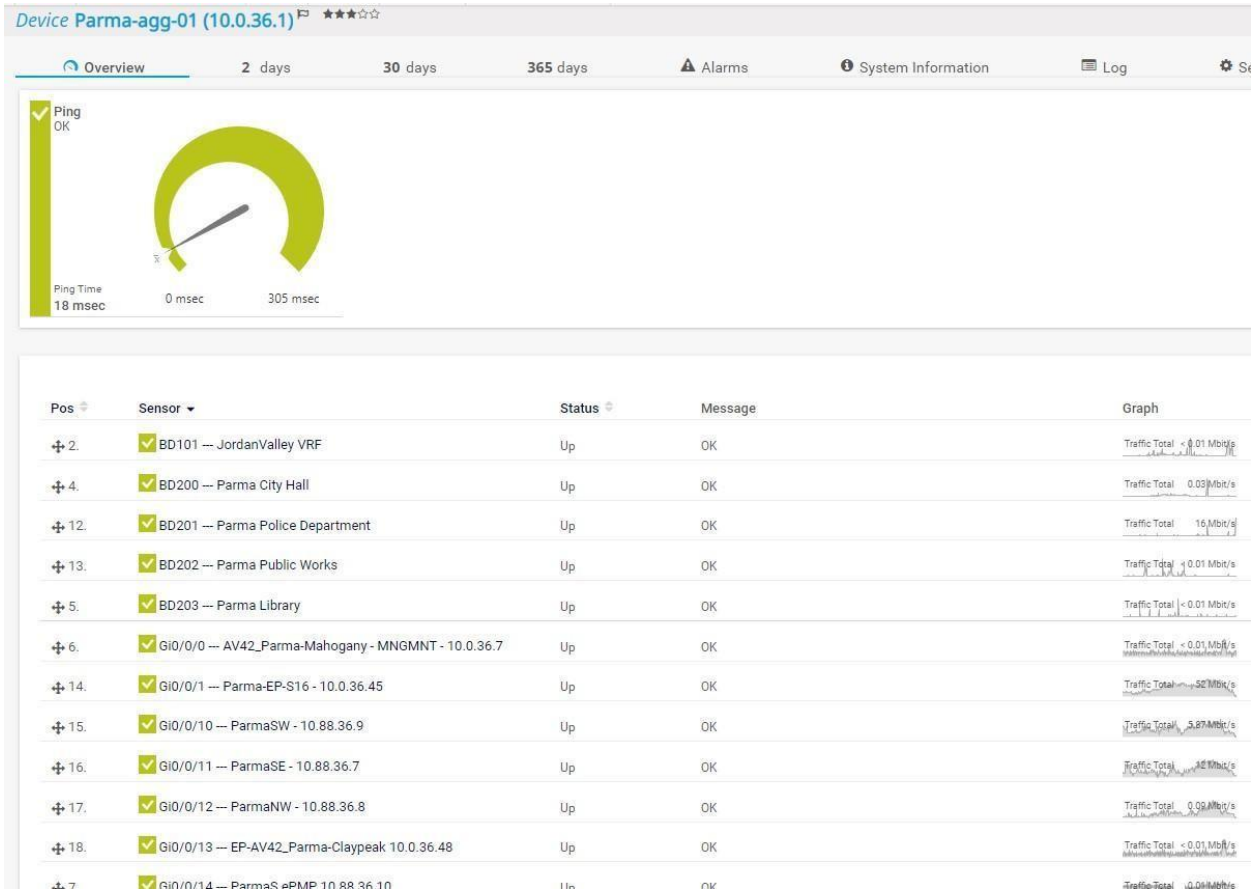

Figure 1 (Aggravate to Circuits)

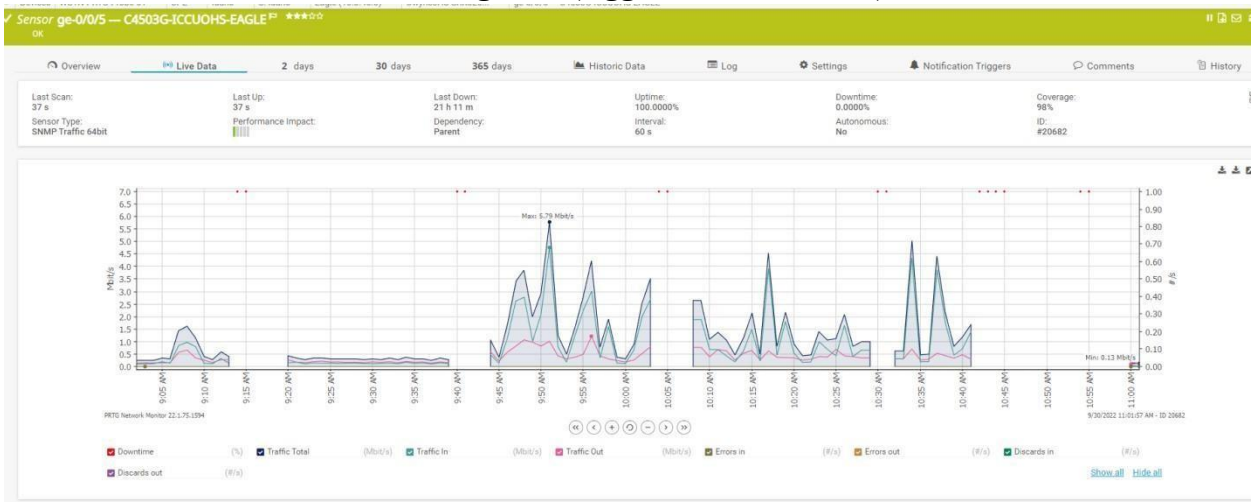

Figure 2 Individual Circuits

Figure 1 is an aggravate device that has circuits leading to multiple commercial customers. Currently, Fatbeam employees can click on an individual circuit and bring up Figure 2 which displaces the amount of bandwidth at what time the customer is pulling from their circuit. Notice in Figure 2 that there are gaps in bandwidth when a customer's own equipment is offline, but the Circuit is still active. If the Circuit ever goes “down” the interface will replace the green header with a red one.

Implementation

To address the challenges of bandwidth usage monitoring and reporting, an online portal was created and implemented during the summer and fall, respectively. This portal would require a large number of hours and work during July and August of 2022. The online portal retrieves bandwidth usage graphs from Fatbeam's online monitoring system (PRTG) in real-time and offers them to customers. Django was chosen as the appropriate compiler for the project due to the authors familiarity with Python and HTML. The portal was coded using HTML for front end and Python for back end, and the charts were created using the PRTG library and then being redrawn by HTML to prevent security breaches or risk losing unnecessary internal information.

The Django community was perfect for this project as they were quick and willing to help the author with any troubles accessing other websites information to use in the portal. One of the biggest hurdles was automating customer account creation, which couldn’t be achieved as of publishing this document, so all customer accounts must be created manually.

The online portal was tested using various test cases and scenarios, and the test results were evaluated based on the extent to which they addressed the problems faced by clients, the extent to which they improved customer satisfaction, and any other relevant metrics. Some

shortcomings of the programming had to be accepted due to time constraints as the Summer ended.

These shortcomings include a decent loading time for the customer to see their portals more than 2 hours out such as the 30 day and 1 year graph. The automation of customer accounts is something that is currently on hold as well. Certain military installations that want more "personal" observation portals for their top security infrastructure (TSI) networks are also on the way for ICBM installations in north Idaho. Since Fatbeam is under contract they don't have the ability to openly observe traffic on dark fiber and their clients will do most of the monitoring for Fatbeam, but still want the ability to create tickets.

Results

The results of the evaluation of the online portal were positive, with the portal successfully addressing the problems faced by clients and improving customer satisfaction. The online portal enabled clients to monitor their circuit's bandwidth usage in real-time, resulting in greater transparency and improved customer satisfaction. The online portal was also found to be easy to use and accessible, with clients able to retrieve their bandwidth usage graphs with minimal effort.

Currently, when clients are logged onto the Portal, they will see a list of all their circuits. in bright blue buttons that have the location, address, and speed capacity details of the following circuit listed. See in Figure 3.

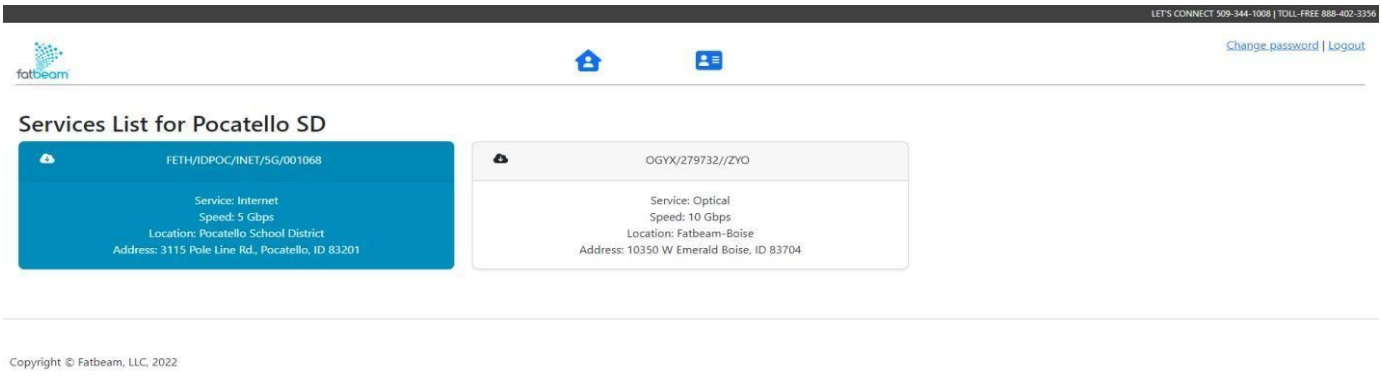

Figure 3 (List of Circuits)

After choosing a circuit to observe the screen will change to have the end and beginning locations of the circuit in a header and repeat the same information that is labeled on the button. As seen in Figure 4.

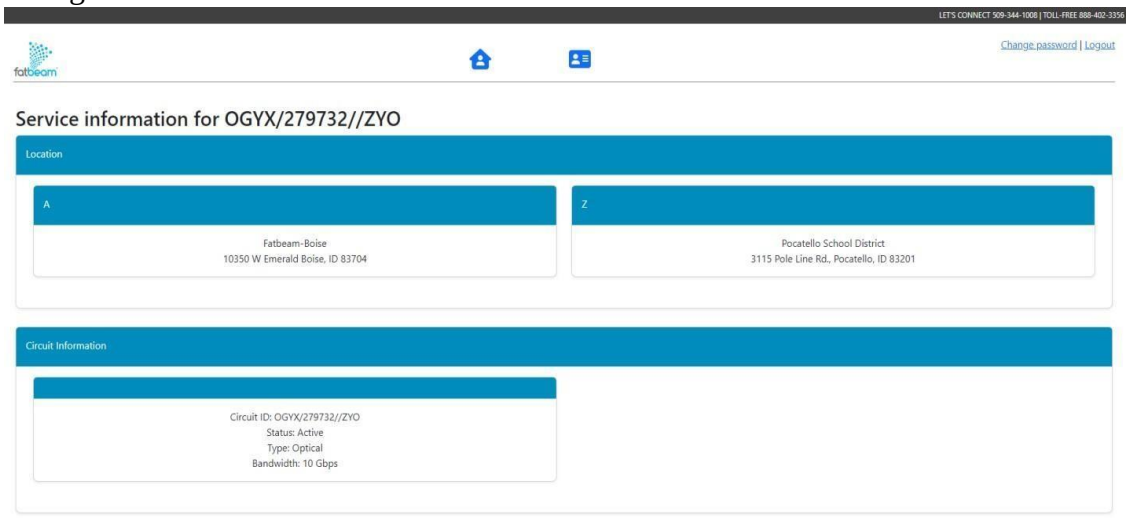

Figure 4 (Selected Individual Circuit)

Currently a customer will be presented with three current graphs from PRTG. The web portal will grab the “2 Hour Graph” (Figure 5), a “2 Day Graph” (Figure 6), and a “30 Day Graph” (Figure 7.)

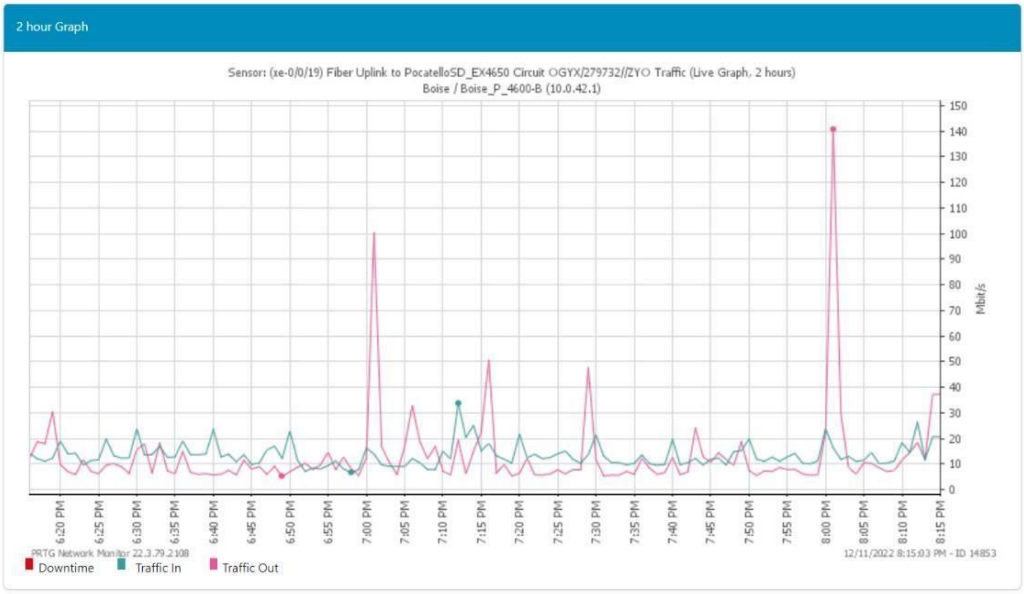

Figure 5 (2 hour graph)

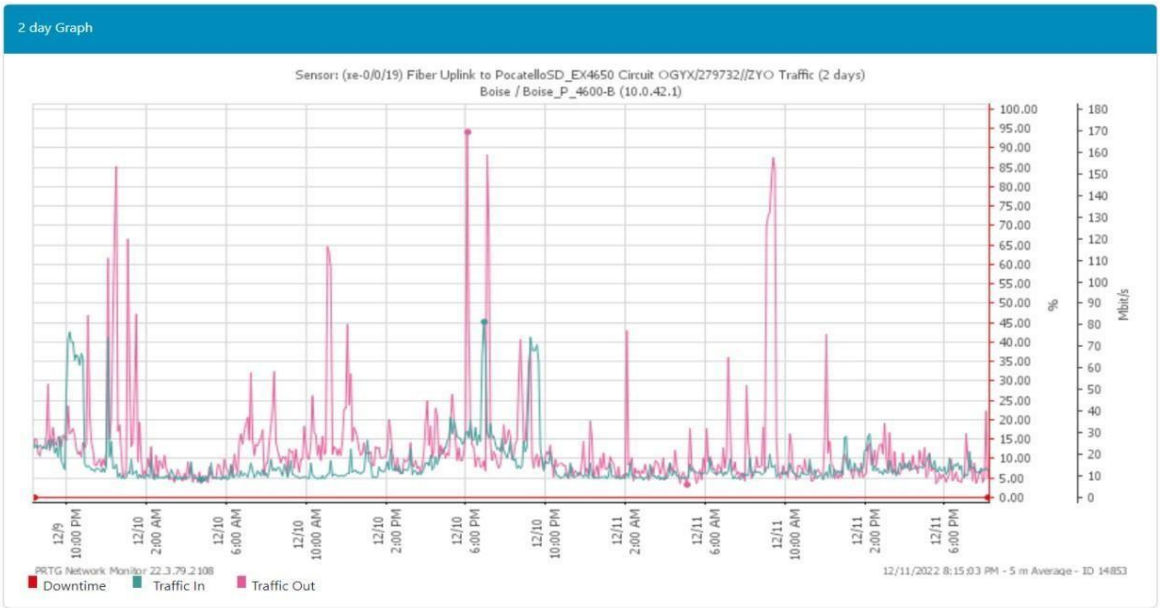

Figure 6 (2 day graph)

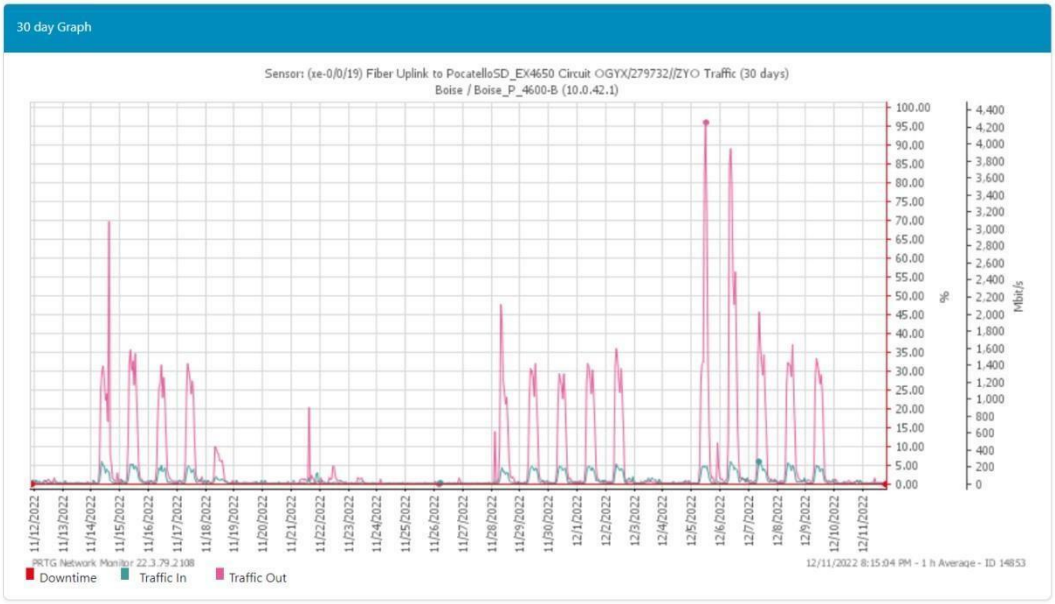

Figure 7 Discussion (30 day graph)

Post portal launch, Fatbeam launched a customer service survey on the portal for further research on future implementation. The findings of the research suggest that the proposed solution of an online portal for bandwidth usage monitoring and reporting is an effective approach that addresses the challenges faced by clients. The limitations of existing approaches to bandwidth usage monitoring and reporting were addressed through the development of the online portal, which offers greater transparency and improved customer satisfaction. The study also provides valuable insights into the next feature that customers want: a way to customize certain portal features or a way to contact the developer via a new contact page. Future renditions will include a way for customers to make tickets through their portal which will notify the NOC of issues a customer is experiencing without having to call in, and eventually the portal will automatically connect a customers profile to their circuits which must be manually done as of this date.

Conclusion

The proposed solution of an online portal for bandwidth usage monitoring and reporting is an effective approach that addresses the challenges faced by clients of Fatbeam. The development and implementation of the online portal resulted in greater transparency and improved customer satisfaction, which has significant implications for the industry. The research highlights the importance of addressing the challenges of bandwidth usage monitoring and reporting and provides recommendations for future work based on the limitations and potential areas for improvement identified in the study.

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