Understanding and Presenting Scientific Data Storage Usage
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Introduction

The idea behind this project was to find a way for groups at Fermilab using Fermilab’s scientific data storage services to better understand the amount of data and resources they are using. Multiple ways were brainstormed to determine the optimal way to achieve this, but the approach taken was to give the storage a monetary value. Fermilab does not charge individual groups usage fees for their storage except for Archive Facility users. Instead, adding hypothetical costs to the service would allow for more mindful storage usage. Research was conducted on multiple cloud computing services such as Google Cloud, Amazon Web Services, IBM, and Microsoft Azure to determine how to put a price tag on Fermilab’s cloud storage. This information was collected, and a website using Flask was created to calculate, display, and inform users about their group’s cloud storage usage.

Research

The bulk of the research for this project was conducted on other cloud computing and storage services such as Google Cloud, Amazon Web Services, IBM, and Microsoft Azure. The primary information collected from these services was the different plans and pricing they offered to users for using their services. This data was collected and put into a spreadsheet to look for similarities among the companies’ services. The main similarities came from three different tiers that the services offered. These tiers were differentiated based on the frequency of data storage and access, and the amount of storage needed. The average prices were taken from each tier and then applied to the respective type of storage Fermilab offers for scientific data storage. Using data already stored, formulas for different types of storage were used to calculate previous months and years usage costs.

Website

The website was created using a Python Library called Flask which is a web framework with a small easy-to-extend core that allows you to develop web applications. The main reason for using Flask instead of using just HTML, CSS, and JavaScript was the ability to update the webpage live with users’ storage data. The Fermilab scientific data storage servers store data about the amount of storage each storage group uses for each type of storage. Using Flask, the website displays the information from the data file already generated, allowing for the storage groups to easily see their usage while making the website easy to update. This is the most important feature of the website because it allows the storage groups to see the amount of storage they are using and the hypothetical cost of the storage. This will help storage groups see the impact and cost of the information they are storing allowing for more mindful storage usage. While also helping the service provider to provide storage services more efficiently.

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