

Cost Proposal: Flipt(ed)

The potential sources of costs that we have identified are

1. CI (GitHub Actions)
2. Cloud computing services (AWS)
 - a. Lambda (serverless backend)
 - b. DynamoDB (backend database)
 - c. Cognito (authentication)
 - d. API Gateway (REST endpoint)
 - e. S3 (storage for documents/videos/photos)
 - f. Route 53 (domain name registration)

CI

GitHub Actions: This is the CI solution we have chosen. The potential source of charges is the use of Actions minutes. The free tier allows up to 2,000 Actions minutes per month. Currently, each commit we make takes between 20s and 1min to run the Actions. Assuming that each commit takes 1min in Actions and that the 5 teams each make 10 commits per day, the estimated usage of Actions minutes is 1,500 minutes per month, which falls in the free tier. If the usage of Actions minutes ends up being higher, there are two solutions. The repositories could be made public, which would remove the restrictions. Alternatively, an upgrade to the first paid tier, which allows more action minutes, would cost \$4 per month per developer.

AWS services

Estimates have been calculated using the AWS Pricing Calculator: <https://calculator.aws/#/>

Lambda: Here, we assume that each user of the system, student, teacher, or developer, spends an average of 5 hours per day using the system. Also, assume that the system makes 5 Lambda requests per minute of use. This results in 1,500 requests per user per day, or 45,000 per month.

DynamoDB: Assume 25MB per user to store profile information, assignment information, grades, etc. Since each Lambda request will likely read and/or write to the database, assume 22,500 reads and 22,500 writes per user per month.

Cognito: Assume that each user is a Monthly Active User, without advanced security features enabled.

API Gateway: Since the REST endpoint will be the trigger for Lambda calls, similar estimates have been made for the number of calls to the API. Assume 45,000 calls per user per month.

S3: Assume 1GB of storage per user to store files, such as documents, videos, and photos.

Route 53: The cost to register a .com domain for 1 year is \$12.

Cost Breakdown Table

Based on the above assumptions, here are the monthly estimated itemized and total costs at different stages in the development and production process.

# of users	Cognito	Lambda	Dynamo	REST API	S3	Route 53	GitHub	total estimate
<u>Development support (April-June)</u>								
dev only (30 users)	\$0.00	\$0.07	\$1.42	\$4.72	\$0.69	\$2.00	\$0.00	*\$8.90
dev + alpha testers (50 users)	\$0.00	\$0.25	\$2.30	\$7.88	\$1.15	\$2.00	\$0.00	*\$13.58
<u>Production Projections (June - ...)</u>								
10K	\$0.00	\$89.80	\$434.38	\$1,493.10	\$230.00	\$2.00	n/a	\$2,249.28
100K	\$275.00	\$899.80	\$4,343.75	\$11,363.10	\$2,251.20	\$2.00	n/a	\$19,134.85
1M	\$4,415.00	\$8,999.80	\$43,437.50	\$86,003.10	\$21,563.20	\$2.00	n/a	\$164,420.60

*should be covered by AWS Educate