

STACKOVERFLOW

HIGH LEVEL

SYSTEM DESIGN

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functional requirements

① Post Question

- ⓐ user should be logged in to post a question.
- ⓑ associate question with tags
- ⓒ upvote|downvote question
- ⓓ add comments to question
- ⓔ Question can contain text/images.

② Post Answer

- ⓐ user should be logged in
- ⓑ multiple answers can be associated to question
- ⓒ upvote|downvote answer
- ⓓ add comments to answer
- ⓔ single user can write single answer

③ Questions Newsfeed

- ④ user should be notified for questions subscribed to

⑤ Search for Questions

- ⑥ User Timeline - Questions | Answers | Actions by user

PL Requirements

- ① Rank answers for a question
- ② Views for question / answer

Non functional requirements

- ① Availability
- ② Latency
- ③ Eventual consistency is OK
- ④ Question/answer once created should be always kept in system unless deleted by user/moderators.

CAPACITY Estimations

Traffic 270 million visits/month

$$TPS = \frac{270,000,000}{30 * 24 * 60 * 60} = 10^4$$

Read TPS = 110

Assumption - 20% users ask question

- 20% users answers the question
(multiple answers + some ques unanswered)

20 questions/second

20 answe/sec

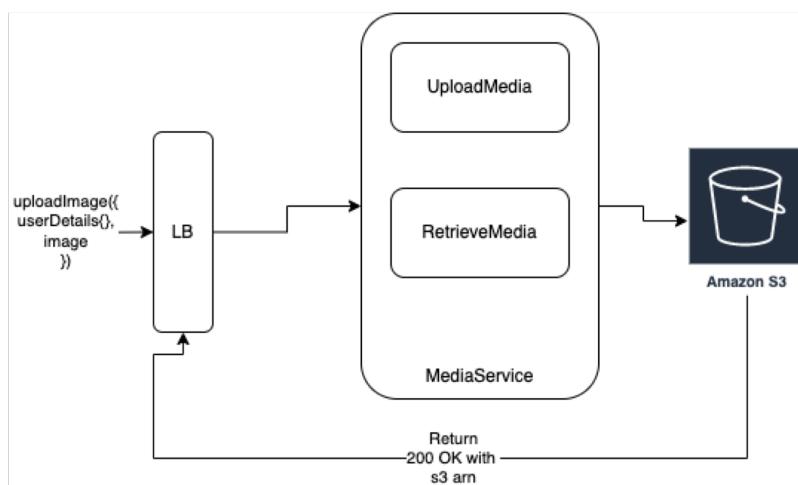
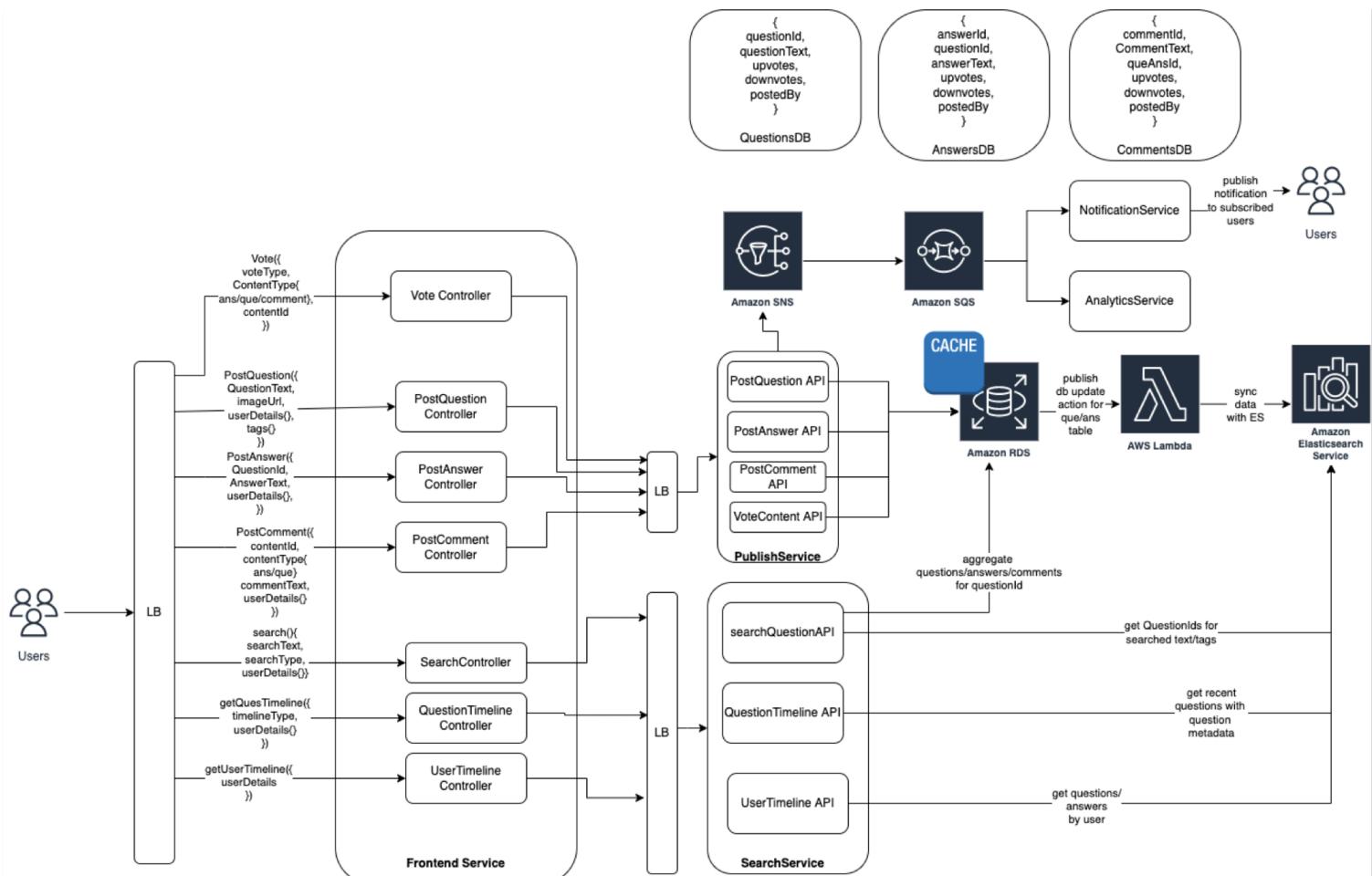
$$\text{approx } 100 \text{ KB/questions} = 40 * 100 = 4000 \text{ KB/second}$$

$$= 4 \text{ MB/second}$$

$$\text{storage/year} = 4 * 60 * 60 * 24 * 365 = \underline{\underline{125 \text{ TB}}}$$

High level architecture -

- ① question is parent entity
- ② multiple answers can be associated to a question.
- ③ multiple comments can be associated to a que/answer.



points to consider -

- ① Elastic Search Schema ?
- ② why RDS and not NOSQL ?
- ③ RDS table relationships ?
- ④ Sharding in database ?
- ⑤ Can any of the APIs be asynchronous ?
- ⑥ Requirement of admin user - as moderator ?
- ⑦ Caching requirement and strategies ?
- ⑧ Background scheduler job to update user badges

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