Log In

Join

Back To Course Home

Grokking Modern System Design Interview for Engineers & Managers

0% completed

System Design Interviews

Introduction

Abstractions

Non-functional System Characteristics

Back-of-the-envelope Calculations

Building Blocks

Domain Name System

Load Balancers

Databases

Key-value Store

Content Delivery Network (CDN)

Sequencer

Distributed Monitoring

Monitor Server-side Errors

Monitor Client-side Errors

Distributed Cache

Distributed Messaging Queue

Pub-sub

Rate Limiter

Blob Store

Distributed Search

Distributed Logging

Distributed Task Scheduler

Sharded Counters

Concluding the Building Blocks Discussion

Design YouTube

System Design: YouTube

Requirements of YouTube's Design

Design of YouTube

Evaluation of YouTube's Design

The Reality Is More Complicated

Quiz on YouTube's Design

Design Quora

Design Google Maps

Design a Proximity Service / Yelp

Design Uber

Design Twitter

Design Newsfeed System

Design Instagram

Design a URL Shortening Service / TinyURL

Design a Web Crawler

Design WhatsApp

Design Typeahead Suggestion

Design a Collaborative Document Editing Service / Google Docs

Spectacular Failures

Concluding Remarks

Course Certificate

Mark Course as Completed

System Design: YouTube

Let's understand the basic details to design the YouTube service.

We'll cover the following

- What is YouTube?
- YouTube's popularity
- YouTube's growth
- How will we design YouTube?

What is YouTube?#

YouTube is a popular video streaming service where users upload, stream, search, comment, share, and like or dislike videos. Large businesses as well as individuals maintain channels where they host their videos. YouTube allows free hosting of video content to be shared with users globally. YouTube is considered a primary source of entertainment, especially among young people, and as of 2022, it is listed as the second-most viewed website after Google by Wikipedia.

A depiction of a content creator uploading a video to YouTube that is streamed by many viewers

YouTube's popularity#

Some of the reasons why YouTube has gained popularity over the years include the following reasons:
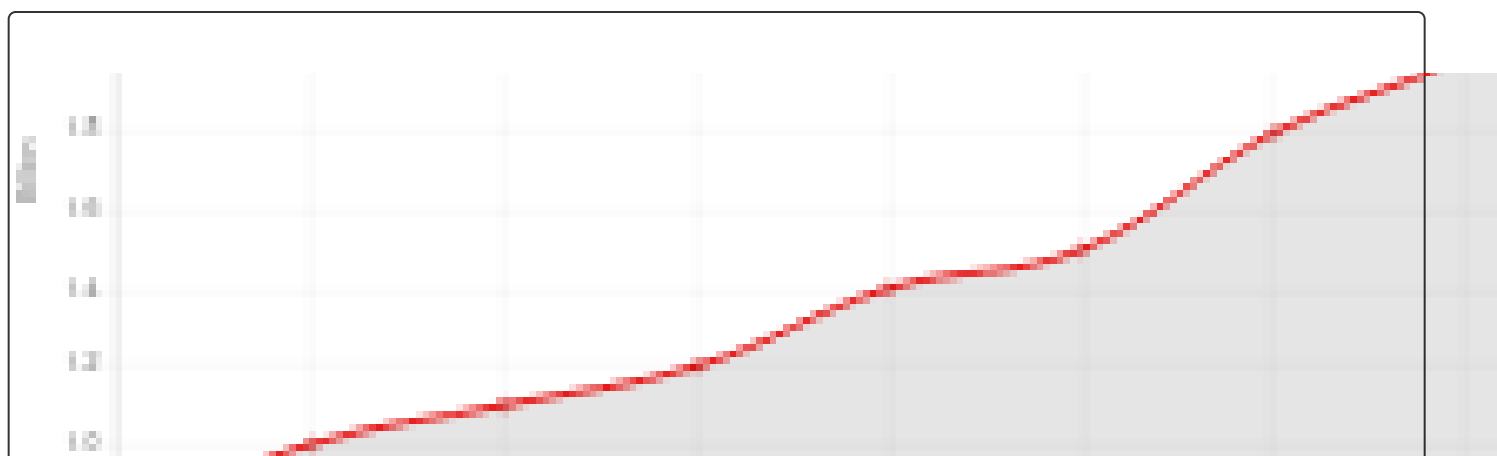
- **Simplicity**: YouTube has a simple yet powerful interface.
- **Rich content**: Its simple interface and free hosting has attracted a large number of content creators.
- **Continuous improvement**: The development team of YouTube has worked relentlessly to meet scalability requirements over time. Additionally, Google acquired YouTube in 2007, which has added to its credibility.
- **Source of income**: YouTube coined a partnership program where it allowed content creators to earn money with their viral content.
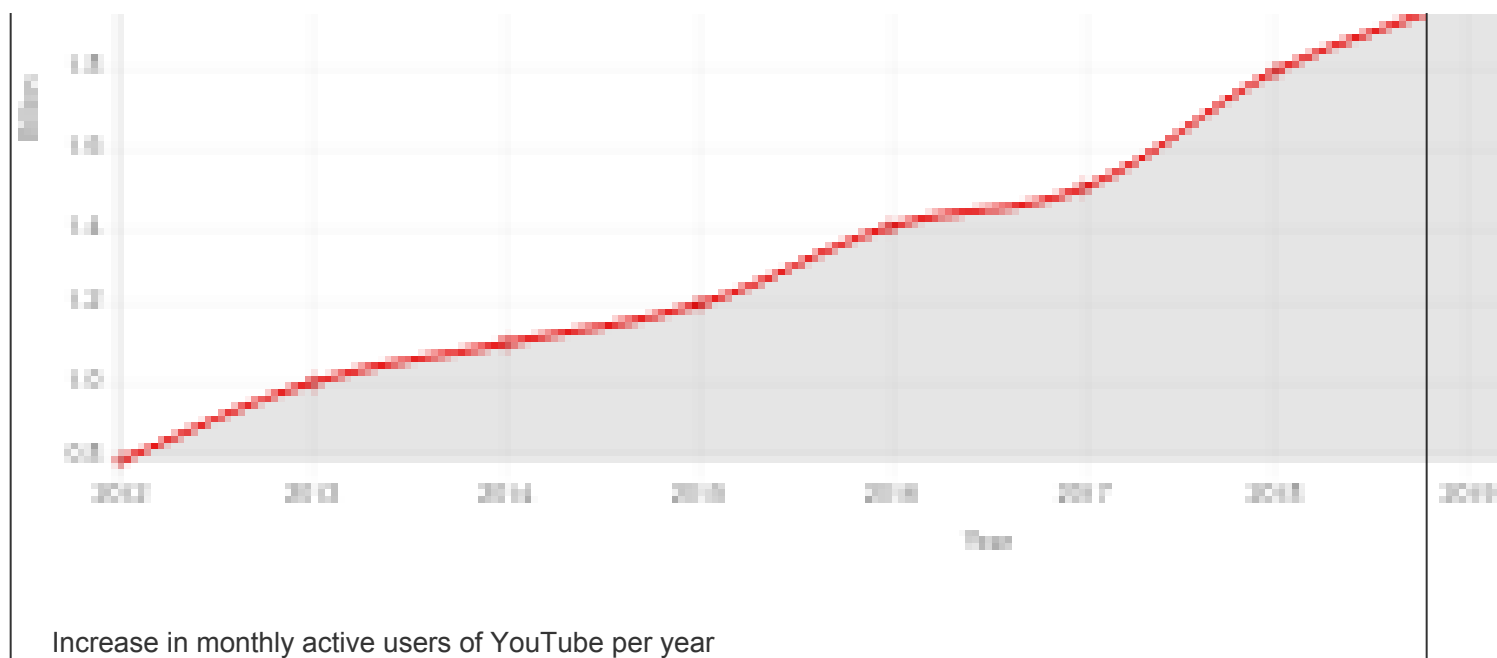
Apart from the above reasons, YouTube also partnered up with well-established market giants like CNN and NBC to set a stronger foothold.

YouTube's growth#

Let's look at some interesting statistics about YouTube and its popularity.

Since its inception in February 2005, the number of YouTube users has multiplied. As of now, there are more than 2.5 billion monthly active users of YouTube. Let's take a look at the chart below to see how YouTube users have increased in the last decade.

Increase in monthly active users of YouTube per year

YouTube is the second most-streamed website after Netflix. A total of 694,000 hours of video content is streamed on YouTube per minute!

Now that we realize how successful YouTube is, let's understand how we can design it.

How will we design YouTube?#

We've divided the design of YouTube into five lessons:

1. **Requirements**: This is where we identify the functional and non-functional content uploaded to YouTube per day.

2. **Design**: In this lesson, we explain how we'll design the YouTube service. We also briefly explain the API design and database schemas. Lastly, we will also briefly go over how YouTube's search works.

3. **Evaluation**: This lesson explains how YouTube is able to fulfill all the requirements through the proposed design. It also looks at how scaling in the future can affect the system and what solutions are required to deal with scaling problems.

4. **Reality is more complicated**: During this lesson, we'll explore different techniques that YouTube employs to deliver content effectively to the client and avoid network congestions.

5. **Quiz**: We reinforce major concepts we learned designing YouTube by considering how we could design Netflix's system.

Our discussion on the usage of various building blocks in the design will be limited since we've already explored them in detail in the building blocks chapter.

Back

The RESHADED Approach for Syste…

Next

Requirements of YouTube's Design

Mark as Completed

Report an Issue