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Effective Caching in Online Video Platforms

Course: Big Data: Big Boon or Big Brother?!
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What is Caching?

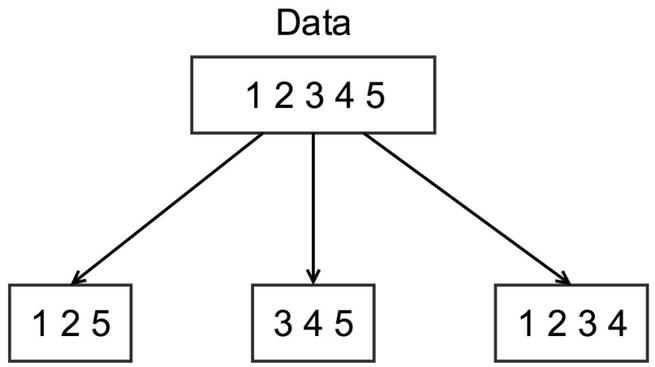
- Caching is a method to store data in a so-called cache.
- It helps improve the efficiency of the computer and the overall efficiency of the task at hand.
- Caching involves pre-loading data into a certain area of memory known as a “buffer” in the local machine.
- YouTube was using RTMP-based Dynamic Streaming.
- If a user had a relatively slow connection, this would not allow them to view the video as smoothly as one would want.
- They could pause the video and view it later when the whole video had buffered to the local storage of the browser.
- YouTube was able to exploit this feature resulting in higher resolution videos being available to the user in a more efficient manner.

Source: http://dyn.com/wp-content/uploads/2011/09/1691_repetitive.jpg

Advantages

Distributed Caching

- A distributed cache may span multiple servers so that it can grow in size and in transactional capacity
- With distributed cache, a website can respond to more requests simultaneously.
- The distributed cached data remain accessible to every server that runs the application when servers are added or removed.



Content Delivery Network

- A *Content Delivery Network*(CDN) is a system of distributed network that delivers web contents to a user based on the geographic locations of the user
- Servers nearest to the website visitor will respond to its request, the CDN can reduce traffic on the primary network

Disadvantages

Technical Side effects

- There is a lot of overhead to check if a video is already in the cache
- The video might have changed in the meanwhile.
- Old videos or videos the user never really watched could end up in the cache and take up disk space.
- The provider no longer has complete control over what happens with the videos.

Social Implications

- Videos could be predicted and pre-loaded when the user is not interested in them.
- Users might not want to have their viewing history recorded.
- YouTube sells the users (anonymized) data to advertisers.

Summary

- It is important that users can a watch video (on services like YouTube) fluently. This uses caching which is a method to store data in a cache.
- A more specific kind of caching - buffering - consists of preloading data into a certain area of memory of local machine.
- Two techniques to deliver web contents effectively are Distributed Caching and Content Delivery Networks.
- Two techniques to deliver web contents effectively are Distributed Caching and Content Delivery Networks.
- The disadvantages of caching is that the cache is difficult to maintain.
- Social implications of caching - Users privacy: Users viewing history might be used without their consent.

Sources

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