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CS 377 Outline

**Content Delivery Networks**
Are bits forever?

Our group will discuss how content delivery networks work to replicate content across the globe.

**Introduction**
- Introduce group members to class and give an overview of our topic.

**Chris G.**
- What are content delivery networks?
  - CDNs consist of many servers located around the world. It’s purpose is to duplicate web services and applications from other servers so that users who want to access websites hosted in a different region from their own can have fast, reliable connections to said sites.
  - We’ll give an example of a current company that is a CDN. (ie. Akamai) and some of the popular websites they provide services to. (ie. Apple, Facebook, Bing, Twitter, eBay and healthcare.gov)

- How do content delivery networks actually work?
  - “A user requests a page in which all the page’s components (images, HTML, dynamic content) are retrieved from the website’s server or origin, which could be anywhere in the world. A CDN caches all files locally in the local data center they’ve established.” [4]
    - We will show a few images at this point to convey the above.

**Matt G.**
- Advantages of content delivery networks
  - They are used because of its speed/ease of access.
    - When the servers themselves are closer it creates faster response time in general.
    - Also if even if the closer server is busy, there are multiple options to choose from to allow a faster and easier access to the data a client wants.
  - A great way to backup data and recover lost or stolen files.
    - Although not considered a major priority, but more of a side effect, is the fact that because there are duplicates made of much of the data, there is a backup type system that happens. Even if something is removed or damaged on one server it can be retrieved and replaced by another.
    - Although the duplication of data makes it easier to be illegally harvested or stolen, it also allows for recognition of where certain attacks are happening and what type of data is being targeted allowing for a quick response on the rest of the nodes to secure similar data.
You can access them from anywhere in the world.
- Possibly the most important part of a CDN is the fact that it allows for more efficient data access nation and even world wide.
- With this ability it allows for faster processing and manipulation of data, allowing faster growth in all areas of the web, from business to personal, faster access, means faster creation, leading to faster final products.
- Adds a sense of permanency to data previously available.
  - With there being so many duplicates of one particular piece of data, it creates a feeling of permanency, because of the, often times, sheer number of copies there are of a particular piece of data.
  - This makes publishing a data point on these networks that much more significant, being that, in theory, that information will be there forever, and completely removing it would be very difficult. This can be seen in a very positive light or a very negative one.
- Data also tends to spread quickly. (This can also be a con)
  - With increase speed and access to data comes increase in speed of popularity. Something can be uploaded and in minutes it is getting millions of hits all over the world. This type of data access can only be maintained by the proper implementation of a CDN.
  - The opportunity for something to be accessed by so many people at once has allowed for the creation and celebration of many phenomenal things.

Brook H.
Disadvantages of content delivery networks
- Cost
  - One of the major limitation of CDNs is the associated expensive service fee. Many of the larger CDNs have higher setup and hidden fees.

- Support and Maintenance
  One of the major issues of CDNs is the availability of reliable support team. Organizations have to worry if an issue will be resolved in timely manner by the CDN operator.
  On the other hand, CDN operators must constantly maintain each server with current update and patches without disrupting clients content and service. Organizations must have to make a major step in trusting the CDN operators to handle their day to day networks.

- New points of failure
  - CDNs will create a new point of potential failure along the delivery chains.

- Lack of direct control
  - Since changes to contents are made through CDNs editors and developers will lose the direct control over their content.
  - Website owners must trust their files providers over their files and data.
Security
  - Security is a major concern for public CDNs. When a file is called, information about the referer is also sent along with it. Remotely hosted javascript files are good examples, their code could be modified to collect data about users or systems.

References: