Homework 2

ER Diagram, IT Requirements

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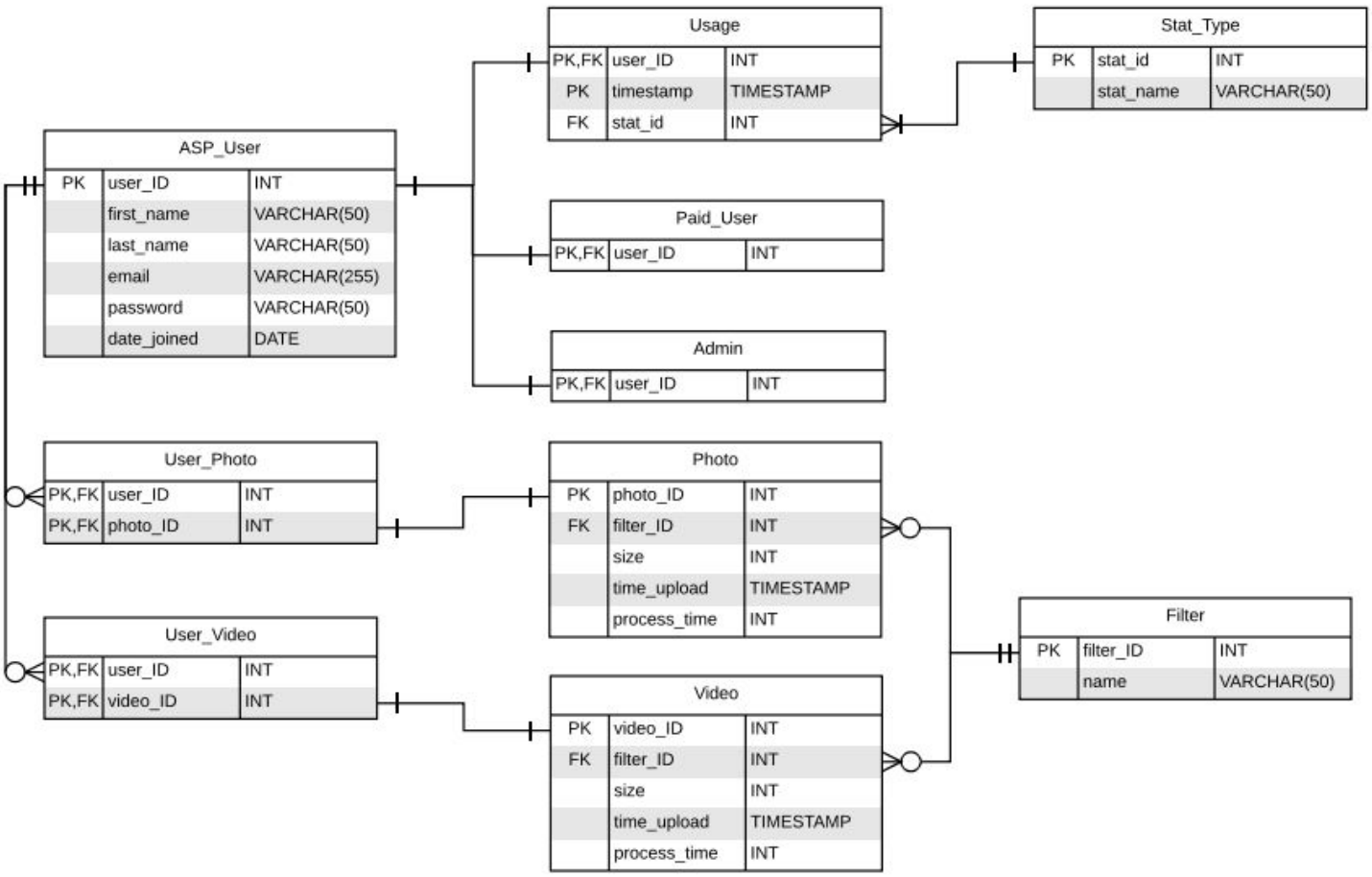
Artistic Stylizer Platform

ER Diagram



Notes:

- Email is stored as a length up to 255 characters because of the SMTP standard
- We store usage/process statistics with the Photo and Video entities, and other statistics in the Usage entity. These other statistics could be a page visit, a site visit, or more. From this, we can derive how many page/site visits there were in a certain time frame. We can also derive how many photos and videos were uploaded from the statistics given by the Photo and Video entities
- Process time is an integer that represents the number of seconds it took for an image to finish processing
- We won't need to store any parameters for the deep learning component

IT Requirements

Server Platforms

1. Database Server

1.1. Physical system requirements

1.1.1. Storage Capacity - 15Mb for each free user, 50Gb for paid (5-10tb initial). Since the max image size a free user can upload is 7Mb, and they can only store two stylized pictures, we give them 15Mb (1Mb for extra leeway). We give 50Gb for paid users, which we think gives them enough space for all their pictures/videos.

1.1.2. Speed requirements / response time parameters - High response time, because we want response times to be instant, so that the platform's performance does not suffer from lengthy database access times.

1.1.3. Scalability plans - Easily scalable storage capacity possibly through use of a storage area network. This is for preparation for the future.

1.2. Virtual system requirements

1.2.1. OS to be supported - Linux

1.2.2. Number of images expected - 2; 1 Primary 1 Backup. We will keep a backup in case the primary becomes corrupted.

1.3. Connectivity

1.3.1. Network considerations - N/A

1.3.2. Interconnection to what other systems - Connected to stylizer server and web server

1. Stylizer Server

1.1. Physical system requirements

1.1.1. Storage capacity - Medium (sub 200gb). Since photos are stored in the database, the only photos that are stored on the stylizer server are the photos that are in the job queue waiting to be stylized. After they are stylized, they are sent to the database server and removed from this server.

1.1.2. Speed requirements / response time parameters - High processing speeds, multiple hyper threaded processors and a dedicated GPU. This is so that the stylizer is given the compute power needed in order to maximize its performance, thus giving decreasing time user has to wait for their image processing.

1.1.3. Scalability plans - None, it just has to have available space (200gb) for patches to the ASP, and for the temporary photos held in the job queue.

1.2. Virtual system requirements
    1.2.1. OS to be supported - Linux
    1.2.2. Number of images expected - 2; 1 Primary 1 Backup. We will keep a backup in case the primary becomes corrupted.

1.3. Connectivity
    1.3.1. Network considerations - N/A
    1.3.2. Interconnection to what other systems - Connected to database server

1. Web Server
1.1. Physical system requirements
    1.1.1. Storage capacity - Low (sub 100gb). Nothing is uploaded directly to the web server, and the website itself is not very large. We will not store much on the web server.
    1.1.2. Speed requirements / response time parameters - High response Time, lots of RAM. We want the website to be responsive and load quickly for the user.
    1.1.3. Scalability plans - Should be able to add more RAM, processing power, and networking capabilities, or just more web servers as platform popularity grows
1.2. Virtual system requirements
    1.2.1. OS to be supported - Linux
    1.2.2. Number of images expected - 1 initially, with 1 backup. We will keep a backup in case the primary becomes corrupted.
1.3. Connectivity
    1.3.1. Network considerations - Several NICs (2 for now) and redundant, high capacity network connectivity. This is to allow high network traffic to pass through without being bottlenecked by the server's network connectivity.
    1.3.2. Interconnection to what other systems - Database Server

2. Reliability
2.1. Service Level Agreements
    2.1.1. Uptime requirements - Our Web Server needs to be up 99.99% of the time, we will have scheduled maintenance (weekly basis) on the Stylizer and Database server, and for those periods our service will be unavailable. We want the website to be accessible at all times, and we think that this metric is possible, because of strong web server technology and security. However, 100% uptime is not possible in a real-world situation, so we only guarantee 99.99%.
    2.1.2. Response time requirements - Our user should be able to have their picture converted in a matter of seconds. If they upload a video, it may take several minutes depending on the length, but any process running for over an hour will be terminated. The website should have an instant response time so that the user is not discouraged from using the site.

3. Recoverability

3.1. Where are things backed up? How often? - The ASP will save two copies of each image for our paid users, one primary and one backup, at the time of its creation. There will also be a backup written for all user information at the time of its creation. We will encourage free users to save their created images locally.

3.2. Access to backups? - The paid user will not have access to their backup images unless the primary is compromised, at which point the backup becomes the primary data source. Free users will not have any backups.

3.3. What data is transient and doesn't need to be stored longer term? - Any data stored or cached by the web server will not need to be stored long term. In addition, the base image the user uploads will not need to be stored.

4. Security and Privacy

4.1. Database

- 4.1.1. Access controls by user id / roles - Users will login using a user id that determines their membership level. System administrators will log in to their backend reporting separate from the front facing website, and also have a user id for the database access tool.
- 4.1.2. Update vs. Access - users will be able to access their images stored on the database through the website, as well as view other users' showcased ones. The only way a user can update the database is by submitting an image to be stylized through the web interface, removing an image from their profile, or updating their account settings. Users will not be able to delete anything from the database. The administrators will have full database access through a separate application to run SQL commands against
- 4.1.3 Usernames - There will be one admin username, which allows the user to have full database and reporting control. There will be one username for application purposes, which allows the user to have limited database control (no create, delete, or drop, only read and update). Finally, there will be another username for reporting purposes, which just allows the user to query statistical information.

4.2. Account information

- 4.2.1. User data - Users will store very minimal personal data on our site; their name, email, a profile picture, and a short bio. The upgrade to a premium account will be a one time cost to a credit card, so it will not be stored. Passwords will be encrypted with SHA256.
  - 4.2.1.1. Personal / registration - The registration of a user will be linked to an email account of theirs.

4.2.1.2. Saved information - We will use session variables to store temporary session data

4.3. Admin access controls

4.3.1. Adding new users, deleting old - Admins will be able to send out warnings that free users accounts will be deactivated after inactivity for 2 years. We think 2 years is a good amount of time to detect that an account is not being used anymore. Admins will not be in charge of creating new users, but will have the ability to do so. Paid users keep their accounts permanently.

5. Maintenance

5.1. Planned down time requirements

5.1.1. Database and stylizer maintenance - maintenance of these services will occur as needed during non peak hours after a notification posted a day ahead on the site. During this period, the database and the stylizer will be down.

5.1.2. Site maintenance - the site can be instantly updated, and will stay up during maintenance.

5.1.3. Times of year when IT does maintenance - Weekly basis during off-peak hours (night-time). This way, it's a balance of having the least amount of users impacted and the platform staying well-maintained.

5.1.4. Times of year when the systems are not available? - It will be available a vast majority of the time of the year as it is not a seasonal application.