

Security and Data Analysis

Super Smash Bros Brawl – SSBB

CSSE 333

Trevor Krenz

Seth RanChao Zhang

Richard Thai

Contents

1. Privacy Analysis	3
2. Security Analysis	3
3. Entity Integrity Analysis	3
a.....	3
b.	3
c.....	3
d.	3
e.	3
f.	3
g.....	4
4. Referential Integrity Analysis	4
5. Business Rule Integrity Analysis	4
Key Stakeholders.....	4
References	4
Glossary.....	4

1. Privacy Analysis

For the SSBB (Super Smash Bros Brawl) database, all player names are public. A player can view all of another player's information, save for their password. No player can view any other player's password, including their own. Player's usernames and passwords are stored in the database hashed in order to add an extra layer of security—in the event that an unauthorized person is able to access such information, it would be very costly to attempt to decode the information. Other than a user's password, no data is considered to be private since the database is intended to integrate with the game as a social-networking extension. In addition to hashing usernames and passwords, the database would process external information exclusively through stored procedures to help prevent SQL injections.

2. Security Analysis

The main security implications behind a database breach is that a username and corresponding password are extracted, and decoded, which could then be used to attempt to find other accounts of the user over other services—assuming that the user utilized the same username and password (typically a likely scenario). In addition, a user logged in as someone else could add erroneous data by impersonating the player during matches (which has no dire consequences other than a rise/fall in Wins/Losses) or changing their favorite character (again, no dire consequence). To help prevent privacy breaches, no Player is able to view any other player's (including their own) password. Users of the system will be notified upon discovery of a breach and urged to change their passwords, however, due to the low nature of the data, there exist no direct consequences for a breach.

3. Entity Integrity Analysis

- a.** For the Player table, Username must be a unique and non-null 30 character nvarchar that is the primary key. Password must be a unique and non-null 30 character nvarchar, Wins is an integer, Losses is an integer, FavCName is a 30 character nvarchar that is a foreign key to the Character table, and Active is a boolean.
- b.** For the Match table, ID must be a unique integer that is the primary key. Type is non-null and non-empty 30 character nvarchar, Date is a date, and Time is a time.
- c.** For the Tier table, Name is a unique and non-null 30 character nvarchar primary key. Level is a non-null integer.
- d.** For the Character table, Name is a unique and non-null 30 character nvarchar primary key. Color is a non-null and non-empty 30 character nvarchar, Tname is a 30 character nvarchar that is a foreign key to the Tier table, Gname is a 30 character nvarchar that is a foreign key to the Game table.
- e.** For the Game table, Name is a unique and non-null 30 character nvarchar primary key. Company is a non-null and non-empty 30 character nvarchar.
- f.** For the Stage table, Name is a unique and non-null 30 character nvarchar primary key. Boundary_size is a non-null and non-empty 30 character nvarchar, while Gname is a 30 character nvarchar that is a foreign key to the Game table.

- g.** For the Selection table, Username is a 30 character nvarchar foreign key to the Player table and Cname is a non-null 30 character nvarchar that is a foreign key to the Character table.
- h.** For the Friend table, NameA and NameB are non-null and non-empty 30 character nvarchar's that are also foreign keys to the Player table.
- i.** For the Player_Match table, MID is unique integer that is a foreign key of the Match table. In addition, Pname is a 30 character nvarchar that is a foreign key to the Player table and Cname is a 30 character nvarchar that is a foreign key to the Character table.

4. Referential Integrity Analysis

All delete operations will reject if there is a referential integrity violation. If a player no longer wishes to participate in the system, they may choose to deactivate their account ('Active' column in the Player table). The reason for this is that the Player's name may be referenced as a foreign key in multiple matches.

On update all operations will cascade or reject (only if the operation would create a null pointer). We would regularly need to and expect updates to certain columns such as 'Wins' and 'Losses' in the Player table.

5. Business Rule Integrity Analysis

The database updates when players input the result of their matches in the system in order to keep the latest records of leaders in competition.

Key Stakeholders

Name	Role
Nadine Shillingford	Project Advisor
Sriram Mohan	Project Advisor
Richard Thai	Project Team
Trevor Krenz	Project Team
Seth Zhang	Project Team
Nintendo	Game Publisher
Smash Brothers Brawl Players	End User

References

[1] Super Smash Bros. Brawl Smash Nintendo Sales Records: http://www.nintendo.com/whatsnew/detail/AU8xLess7wISKbSMpYCj_HThii8UiBzG

Glossary

Entity-Relationship (ER) diagram – abstract and conceptual representation of data

SSBB – Super Smash Bros Brawl, a best-selling game for the Nintendo Wii console