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# Infological Modelling Sample

Relational Databases Basics



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In real life this is a LONG iterative process. It may take days and months. And even here (with this extremely simplified sample) you'll have to spend a lot of time in order to comprehend all the information.

# Initial setup

We are working on the database for the “File Exchange” service. Here is the info from the customer:

1. The application may contain several pages (the quantity, the hierarchy, and the contents may vary).
2. Application users may create groups and join such groups.
3. Each user may have several roles with a set of permissions for each role.
4. Users may upload and download files, share files with specific users, groups of users, and the whole world.
5. Users may comment files.
6. Each file has a rating.
7. There may be replies to comments (and other replies) – up to 10 levels of nesting depth.
8. Each file must belong to a category, which determine the set of permissions and limitations.
9. The application shall log all actions of all users.
10. There must be possibility to ban users, groups of users, and non-registered users (by ip address).
11. The application shall display (with minimum time delay) the following statistics: total users, total uploaded files quantity and volume, total downloaded files quantity and volume.

# Entities

#	Requirement text	Entity
1	The application may contain several pages (the quantity, the hierarchy, and the contents may vary).	Page.
2	Application users may create groups and join such groups.	User, user group.
3	Each user may have several roles with a set of permissions for each role.	Role, permission.
4	Uses may upload and download files, share files with specific users, groups of users, and the whole world.	File.
5	Users may comment files.	Comment.
6	Each file has a rating.	Mark.
7	There may be replies to comments (and other replies) – up to 10 levels of nesting depth.	Comment.
8	Each file must belong to a category, which determine the set of permissions and limitations.	File category.
9	The application shall log all actions of all users.	Log.
10	There must be possibility to ban users, groups of users, and non-registered users (by ip address).	Ban reason.
11	The application shall display (with minimum time delay) the following statistics: total users, total uploaded files quantity and volume, total downloaded files quantity and volume.	Statistics.

# Entities

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1. Page.
2. User.
3. User group.
4. Role.
5. Permission.
6. File.
7. Comment.
8. Mark.
9. File category.
10. Log.
11. Ban reason.
12. Statistics.

# Final view (entities and attributes), page 1/7

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1. Page:
  - a. Id.
  - b. Parent page (rFK).
  - c. Name (to display on the page itself).
  - d. Name in menu (unique within one menu level).
  - e. Title (TITLE HTML-tag).
  - f. Keywords (meta ... keywords HTML-tag).
  - g. Description (meta ... description HTML-tag).
  - h. Text.
2. User:
  - a. Id.
  - b. Login (unique).
  - c. Password (sha256-hash).
  - d. E-mail (unique).
  - e. Registration datetime (up to seconds).
  - f. Birth date (up to days).
  - g. Speed bonus for uploads (FK).
  - h. Speed bonus for uploads expiration datetime (up to seconds).
  - i. Volume bonus for uploads (FK).
  - j. Volume bonus for uploads expiration datetime (up to seconds).

## Final view (entities and attributes), page 2/7

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### 3. Bonus:

- a. Id.
- b. Quantity of uploaded files needed to achieve the bonus.
- c. Volume of uploaded files needed to achieve the bonus.
- d. Speed addition.
- e. Volume addition.

### 4. User group:

- a. Id.
- b. Owner (FK).
- c. Name (unique).
- d. Description.

### 5. Role:

- a. Id.
- b. Name (unique).
- c. Upload volume limit (bytes).
- d. Download volume limit (bytes).
- e. Upload quantity limit.
- f. Download quantity limit.
- g. Download speed limit (bytes per second).

6. Permission:
  - a. Id.
  - b. Name (unique).
  - c. Description.
7. File:
  - a. Id.
  - b. Size (bytes).
  - c. Creation datetime (up to seconds).
  - d. Expiration datetime (up to seconds).
  - e. Original name (without extension).
  - f. Original extension.
  - g. Name on server (sha256-hash).
  - h. Control sum (sha256-hash).
  - i. Deletion link (for unregistered users, sha256-hash).
8. Public access link:
  - a. Id.
  - b. File (FK).
  - c. Hash (sha256-hash).
  - d. Expiration datetime (up to seconds).
  - e. Access password (may be NULL, sha256-hash).



9. File access permission:

- a. Id.
- b. File (FK).
- c. Action (FK).
- d. User (FK).
- e. Group (FK).
- f. "Allowed for any registered user" flag.
- g. "Allowed for anybody" flag.

10. Mark:

- a. Id.
- b. File (FK).
- c. User (FK).
- d. Value (1 to 10).

11. Comment:

- a. Id.
- b. File (FK).
- c. Comment (FK).
- d. Text.
- e. User (FK).
- f. Creation datetime (up to seconds).

12. File category:

- a. Id.
- b. Name (unique).
- c. Age restriction (may be NULL, FK).

13. Age restriction:

- a. Id.
- b. Minimal age (years).
- c. Name (unique).
- d. Description.

14. Log:

- a. User (FK, NULL for non-registered users).
- b. Ip-address.
- c. Operation (FK).
- d. File (if applicable, FK).
- e. Datetime (up to seconds).
- f. Parameters (if applicable, text).

15. Operation:

- a. Id.
- b. Name (unique).

16. Log archive (for records older than one month):

- a. User (FK, NULL for non-registered users).
- b. Ip-address.
- c. Operation (FK).
- d. File (if applicable, FK).
- e. Datetime (up to seconds).
- f. Parameters (if applicable, text).

17. Ban reason:

- a. Id.
- b. Name (unique).
- c. Description.

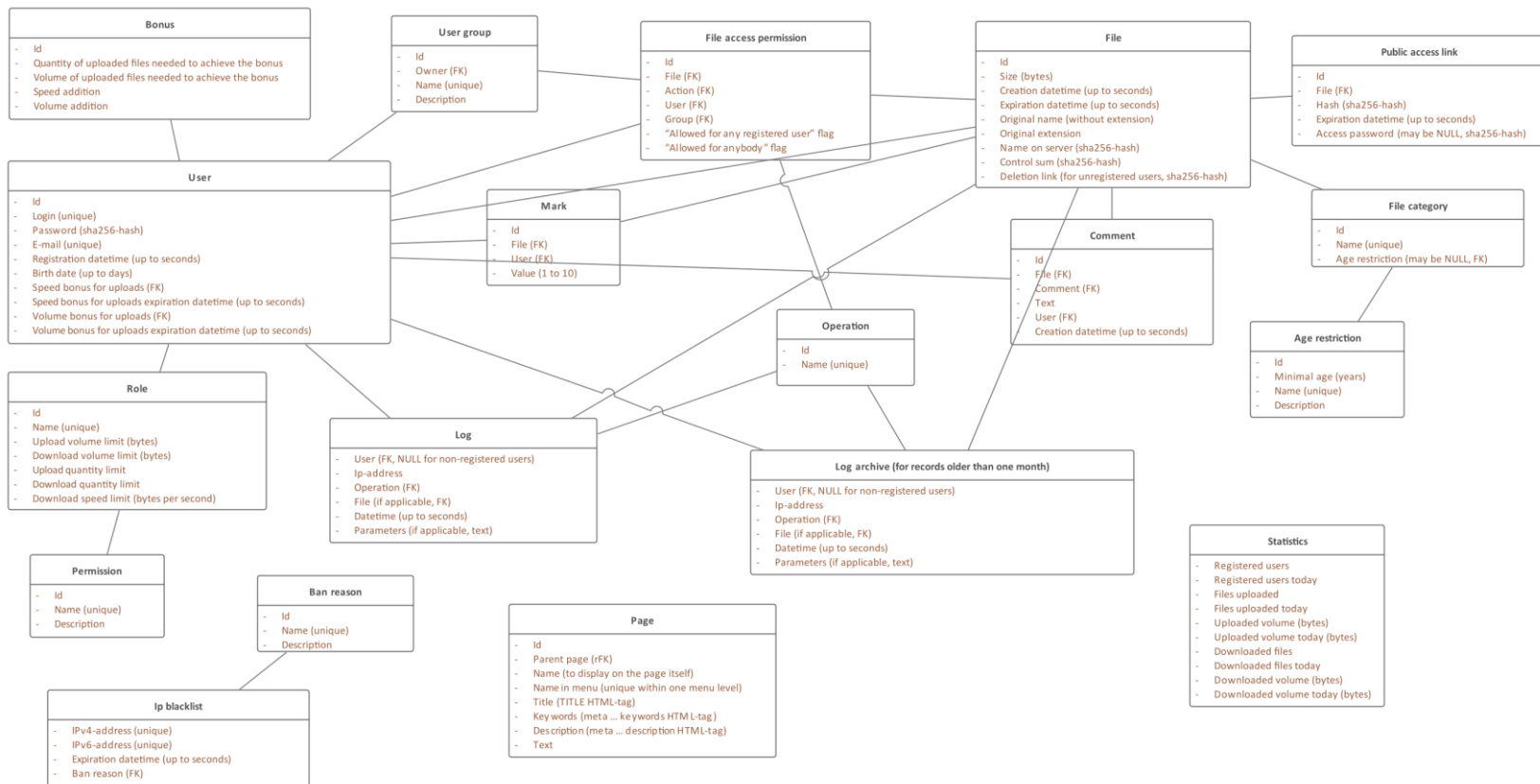
18. Ip blacklist:

- a. IPv4-address (unique).
- b. IPv6-address (unique).
- c. Expiration datetime (up to seconds).
- d. Ban reason (FK).

### 19. Statistics:

- a. Registered users.
- b. Registered users today.
- c. Files uploaded.
- d. Files uploaded today.
- e. Uploaded volume (bytes).
- f. Uploaded volume today (bytes).
- g. Downloaded files.
- h. Downloaded files today.
- i. Downloaded volume (bytes).
- j. Downloaded volume today (bytes).

# Final view, graphical representation (UML)



Quick live demo...

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