

ChatBox - Database

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1 Mediul de dezvoltare

1.1 Cerințe de sistem

Sistem de operare: *Arch Linux*

Kernel: *6.17.2-arch1-1*

Manager de pachete: *pacman*

2 Configurarea și pregătirea bazei de date

2.1 Actualizarea sistemului

Actualizați sistemul folosind comanda:

sudo pacman -Syu

2.2 Instalarea bazei de date MySQL

Instalați MySQL folosind comanda:

sudo pacman -S mysql

La mesajul

:: There are 3 providers available for mysql:

:: Repository extra

1) mariadb 2) mariadb-lts 3) percona-server

Enter a number (default=1):

Selectați opțiunea 1 pentru a instala mariadb

Porniți serviciul bazei de date folosind comanda:

sudo systemctl start mariadb

Extra:

- Pentru a opri serviciul bazei de date folosiți comanda: *sudo systemctl stop mariadb*
- Pentru a porni serviciul bazei de date automat (la fiecare deschidere) folosiți comanda: *sudo systemctl enable mariadb*
- Pentru a verifica serviciul bazei de date folosiți comanda: *sudo systemctl status mariadb*

2.3 Adaugarea utilizatorului in MySQL

Deschide MySQL folosind comanda:

sudo mariadb

Creaza utilizatorul folosind comanda:

CREATE USER 'chatbox_db'@'localhost' IDENTIFIED BY 'chatbox_db';

Acodrai toate drepturile bazei de date folosind comanda:

GRANT ALL PRIVILEGES ON chatbox_db. TO 'chatbox_db'@'localhost';*

Aplica modificarile folosind comanda:

FLUSH PRIVILEGES;

Extra:

- Pentru a vedea toti utilizatorii foloseste comanda: *SELECT user, host FROM mysql.user;*

2.4 Instalarea utilitarului yay

Pentru a instala pachete din AUR (Arch User Repository), este necesar utilitarul yay.

Instaleaza pachetele necesare folosind comanda:

sudo pacman -S --needed base-devel git

Cloneaza repozitoriul folosind comanda:

git clone https://aur.archlinux.org/yay.git

Intra in director folosind comanda:

cd yay

Instalati yay folosind comanda:

makepkg -si

2.5 Instalarea MySQL Workbench

Actualizați baza de date a AUR și pachetele disponibile folosind comanda:

yay -Syu

Instalați MySQL Workbench folosind comanda:

yay -S mysql-workbench

2.6 Pregătirea bazei de date în MySQL Workbench

Deschide MySQL Workbench folosind comanda:

mysql-workbench

Creează un model nou:

- Mergi la *File > New Model*
- Se va deschide fereastra modelului nou cu o Physical Schema implicită.

Redenumeste schema:

- Click stânga pe schema implicită
- Introdu numele: *chatbox_db*

Creează o diagramă EER (Enhanced Entity-Relationship) pentru model:

- Apasă pe *Add Diagram*
- Se va crea o diagramă EER goală asociată cu schema, unde poți adăuga tabele și defini relațiile

2.7 Descrierea tabelelor din model

user_roles				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
name	VARCHAR(50)			
description	VARCHAR(255)			
created_at	TIMESTAMP			CURRENT_TIMESTAMP
updated_at	TIMESTAMP			CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

user_status				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
name	VARCHAR(50)			
description	VARCHAR(255)			
created_at	TIMESTAMP			CURRENT_TIMESTAMP
updated_at	TIMESTAMP			CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

users				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
username	VARCHAR(50)			
email	VARCHAR(100)			
password	VARCHAR(255)			
role_id	INT		users_roles.id	
status_id	INT		users_status.id	
last_login	DATETIME			NULL
created_at	TIMESTAMP			CURRENT_TIMESTAMP
updated_at	TIMESTAMP			CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

messages				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
user_id	INT		users.id	
user_msg	TEXT			
llm_resp	TEXT			
llm_used	VARCHAR(50)			
uploaded_at	TIMESTAMP			CURRENT_TIMESTAMP

files				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
user_id	INT		users.id	
file_name	VARCHAR(255)			
file_path	VARCHAR(255)			
uploaded_at	TIMESTAMP			CURRENT_TIMESTAMP

user_usage				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
user_id	INT		users.id	
date	DATE			
messages_sent	INT			
files_uploaded	INT			CURRENT_TIMESTAMP

plan_types				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
name	VARCHAR(50)			
description	VARCHAR(255)			
created_at	TIMESTAMP			CURRENT_TIMESTAMP
updated_at	TIMESTAMP			CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

plans				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
name	VARCHAR(50)			
price	DECIMAL(8,2)			
type_id	INT		plan_types.id	
duration_days	INT			NULL
name_llm_prm	VARCHAR(50)			
daily_prm_msg	INT			NULL
name_llm_std	VARCHAR(50)			
daily_std_msg	INT			NULL
daily_file_limit	INT			NULL
created_at	TIMESTAMP			CURRENT_TIMESTAMP
updated_at	TIMESTAMP			CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

user_plans				
Coloana	Tip de date	Primary Key	Foreign Key	Default / Expresie
id	INT	da		
user_id	INT		users.id	
plan_id	INT		plans.id	
start_date	TIMESTAMP			CURRENT_TIMESTAMP
end_date	TIMESTAMP			NULL

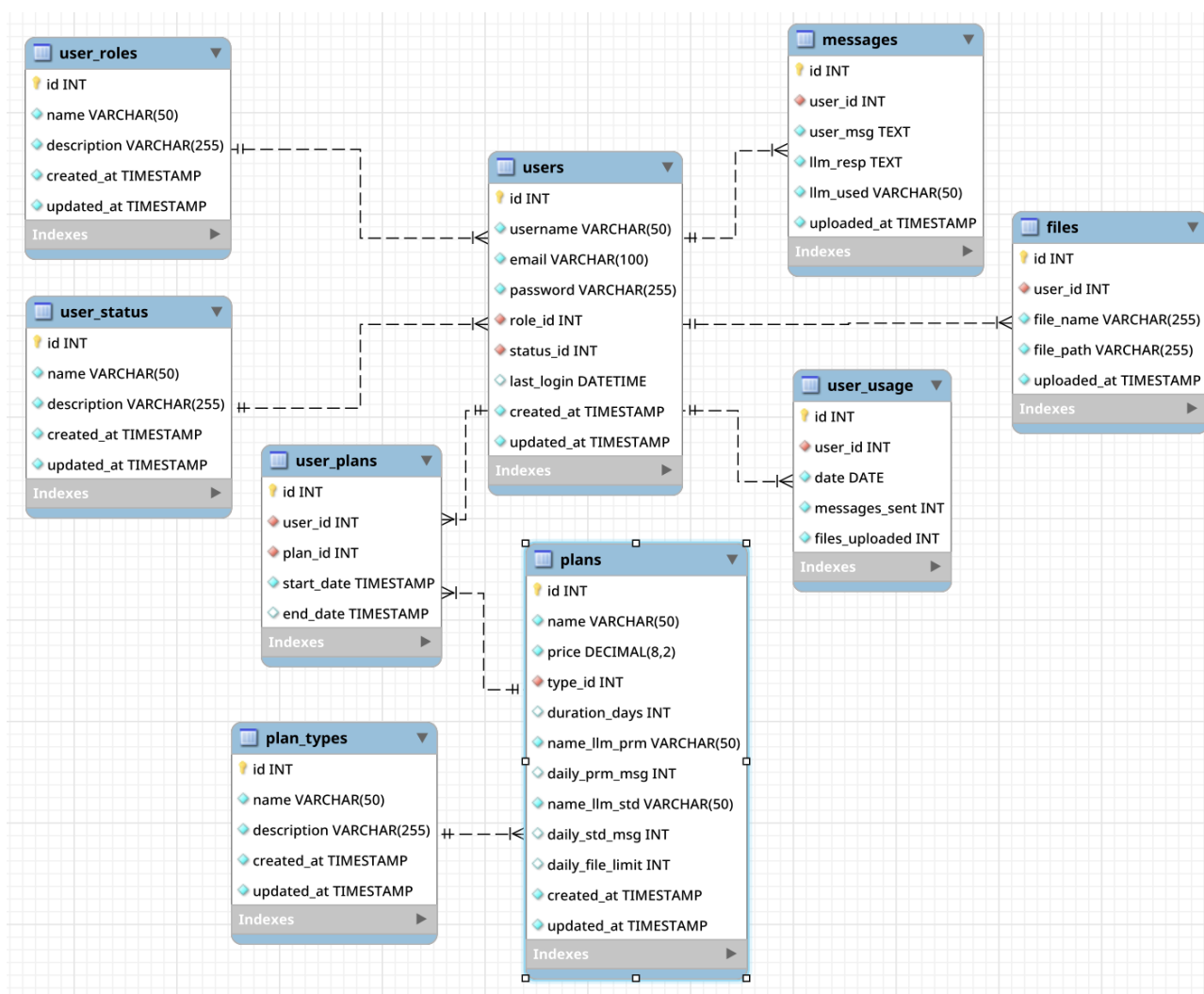


Figure 2.1: Diagrama EER a bazei de date

3 Crearea bazei de date, conectare și backup

3.1 Crearea bazei de date

Creează baza de date astfel:

- Mergi la Database > *Forward Engineer...*
- Se va deschide fereastra Forward Engineer to Database.
- Completează câmpurile conform informațiilor din poza inserată.
- Introdu parola utilizatorului MySQL creat anterior (chatbox_db).
- Apasă Next pana la final apoi Close.

The screenshot shows a window titled "Forward Engineer to Database". On the left is a sidebar with five items: "Connection Options" (selected), "Options", "Select Objects", "Review SQL Script", and "Commit Progress". The main area is titled "Set Parameters for Connecting to a DBMS". It contains the following fields and controls:

- Stored Connection:** A dropdown menu with a "Select from saved connection settings" label.
- Connection Method:** A dropdown menu set to "Standard (TCP/IP)" with a "Method to use to connect to the RDBMS" label.
- Parameters tab:** Contains fields for:
 - Hostname:** "127.0.0.1" with a label "Name or IP address of the server host - and TCP/IP port."
 - Port:** "3306"
 - Username:** "chatbox_db" with a label "Name of the user to connect with."
 - Password:** A field with "Store in Keychain ..." and "Clear" buttons, with a label "The user's password. Will be requested later if it's not set."
 - Default Schema:** An empty field with a label "The schema to use as default schema. Leave blank to select it later."

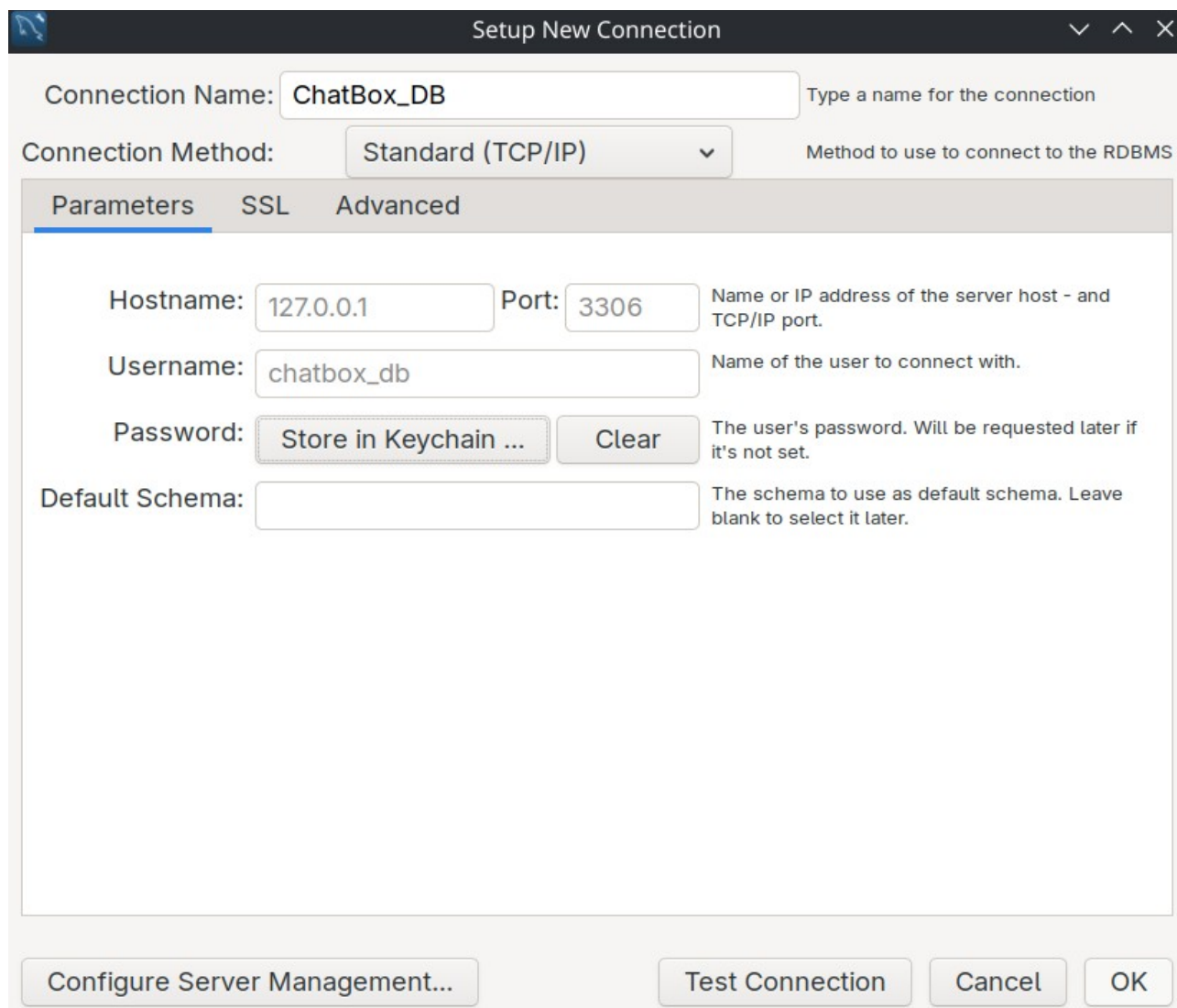
At the bottom right are three buttons: "Cancel", "Back", and "Next".

Figure 3.1: Fereastra Forward Engineer to Database (Connection Options)

3.2 Conectarea la baza de date

Conecteați-vă la baza de date astfel:

- În pagina de pornire, apăsați pe „+” lângă MySQL Connections pentru a crea o nouă conexiune.
- Se va deschide fereastra Setup New Connection.
- Completați câmpurile conform informațiilor din poza inserată.
- Introduceți parola utilizatorului MySQL creat anterior (chatbox_db).
- Apăsați Ok.



Setup New Connection

Connection Name: Type a name for the connection

Connection Method: Method to use to connect to the RDBMS

Parameters SSL Advanced

Hostname: Port: Name or IP address of the server host - and TCP/IP port.

Username: Name of the user to connect with.

Password: The user's password. Will be requested later if it's not set.

Default Schema: The schema to use as default schema. Leave blank to select it later.

Figure 3.2: Fereastra Setup New Connection

3.3 Backup-ul bazei de date

Backup logic:

- Foloseste comanda in terminal: `mysqldump -u chatbox_db -p chatbox_db > /mnt/storage/Facultate/PPAW/ChatBox/database/backup_logic/chatbox_db_backup.sql`
- Introdu parola utilizatorului MySQL creat anterior (chatbox_db).

Explicatie comanda:

- `-u chatbox_db` > user-ul bazei tale
- `-p` > va cere parola
- `chatbox_db` -> numele bazei de date
- `> /cale/către/chatbox_db_backup.sql` > fișierul unde se salvează backup-ul

Backup fizic:

- Te conectezi la MariaDB folosind comanda: `mariadb -u chatbox_db -p`
- Introdu parola utilizatorului MySQL creat anterior (chatbox_db).
- Afla datadir-ul folosind comanda: `SHOW VARIABLES LIKE 'datadir';`
- Iesi din MariaDB folosind comanda: `EXIT;`
- Oprește serverul MariaDB folosind comanda: `sudo systemctl stop mariadb`
- Creeaza un director temporar unde să copiezi baza de date folosind comada: `mkdir -p /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp`
- Copiază baza de date în directorul temporar cu permisiuni root folosind comanda: `sudo cp -r /var/lib/mysql/chatbox_db /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp`
- Intra in directorul temporar creat anterior folosind comanda: `cd /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp`
- Crează arhiva `.tar.gz` din copia bazei de date folosind comanda: `sudo tar -czvf /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup.tar.gz chatbox_db`
- Ștergi directorul temporar folosind comanda: `sudo rm -rf /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp`
- Pornești serverul MariaDB înapoi folosind comanda: `sudo systemctl start mariadb`

Explicatie comanda:

- `tar -czvf` creează o arhivă comprimată:
 - `c` → create
 - `z` → gzip compression
 - `v` → verbose (afișează fișierele adăugate)
 - `f` → file (specifici numele arhivei)

```
[xhadrines@archXhadrines ~]$ echo "" && echo "Backup Logic" && echo ""
Backup Logic
[xhadrines@archXhadrines ~]$ mysqldump -u chatbox_db -p chatbox_db > /mnt/storage/Facultate/PPAW/ChatBox/database/backup_logic/chatbox_db_backup.sql
mysqldump: Deprecated program name. It will be removed in a future release, use '/usr/bin/mariadb-dump' instead
Enter password:
[xhadrines@archXhadrines ~]$ ls /mnt/storage/Facultate/PPAW/ChatBox/database/backup_logic/
chatbox_db_backup.sql
[xhadrines@archXhadrines ~]$ echo "" && echo "Backup Fizic" && echo ""
Backup Fizic
[xhadrines@archXhadrines ~]$ mariadb -u chatbox_db -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 5
Server version: 12.0.2-MariaDB Arch Linux

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> SHOW VARIABLES LIKE 'datadir';
+-----+-----+
| Variable_name | Value |
+-----+-----+
| datadir       | /var/lib/mysql/ |
+-----+-----+
1 row in set (0.000 sec)

MariaDB [(none)]> EXIT;
Bye
[xhadrines@archXhadrines ~]$ sudo systemctl stop mariadb
[sudo] password for xhadrines:
[xhadrines@archXhadrines ~]$ mkdir -p /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp
[xhadrines@archXhadrines ~]$ cp -r /var/lib/mysql/chatbox_db /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp
cp: cannot stat '/var/lib/mysql/chatbox_db': Permission denied
[xhadrines@archXhadrines ~]$ sudo cp -r /var/lib/mysql/chatbox_db /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp
[xhadrines@archXhadrines ~]$ cd /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp
[xhadrines@archXhadrines chatbox_db_backup_temp]$ tar -czvf /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup.tar.gz chatbox_db
tar: chatbox_db: Cannot open: Permission denied
tar: Exiting with failure status due to previous errors
[xhadrines@archXhadrines chatbox_db_backup_temp]$ sudo tar -czvf /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup.tar.gz chatbox_db
chatbox_db/
chatbox_db/db.opt
chatbox_db/user_roles.frm
chatbox_db/user_roles.ibd
chatbox_db/user_status.frm
chatbox_db/user_status.ibd
chatbox_db/users.frm
chatbox_db/users.ibd
chatbox_db/plan_types.frm
chatbox_db/plan_types.ibd
chatbox_db/plans.frm
chatbox_db/plans.ibd
chatbox_db/user_plans.frm
chatbox_db/user_plans.ibd
chatbox_db/files.frm
chatbox_db/files.ibd
chatbox_db/messages.frm
chatbox_db/messages.ibd
chatbox_db/user_usage.frm
chatbox_db/user_usage.ibd
[xhadrines@archXhadrines chatbox_db_backup_temp]$ cd ..
[xhadrines@archXhadrines backup_fizic]$ sudo rm -rf ~/chatbox_db_backup_temp
[xhadrines@archXhadrines backup_fizic]$ sudo rm -rf /mnt/storage/Facultate/PPAW/ChatBox/database/backup_fizic/chatbox_db_backup_temp
[xhadrines@archXhadrines backup_fizic]$
```

Figure 3.3: Backup-ul bazei de date ChatBox realizat în consolă