# Project Analysis Report: DinoDB

## 1. Introduction

DinoDB is a robust database management system aimed at providing granular control over user privileges and   
seamless type compatibility checks. This report delves into the functionalities, privileges, data types, and   
purpose of the code files provided in the project. The analysis aims to present a comprehensive understanding   
of the system's design and utility.

## 2. Privileges (User Permissions)

The project defines various privileges that regulate user actions within the database. Each privilege has a   
specific scope and usage. Below is a detailed list of the privileges and their respective purposes:

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| --- | --- |
| Privilege | Description |
| ALL | Grants all possible permissions. |
| SERVICE | Allows advanced system operations. |
| WRITE | Permission to write data. |
| MODIFY | Permission to modify existing data. |
| READ | Read-only access to data. |
| CREATE | Allows the creation of new tables or databases. |
| SELECT | Permission to read/query data. |
| UPDATE | Permission to update existing data. |
| INSERT | Allows the insertion of new records. |
| DELETE | Permission to delete records. |
| DROP | Allows dropping (deleting) tables or databases. |
| ALTER | Permission to alter the structure of tables. |
| GRANT | Allows granting permissions to other users. |
| SHOW | Permission to view database/table structure or data. |

## 3. Supported Data Types

The DinoDB system supports a variety of data types, ensuring flexibility and compatibility for different   
applications. Below is a list of the supported data types and their primary use cases:

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| --- | --- |
| Data Type | Description |
| Integer | Stores whole numbers. |
| Real | Represents decimal numbers. |
| Text | Holds textual data. |
| Boolean | Stores true/false values. |
| Date | Stores date values. |
| DateTime | Represents both date and time. |
| Decimal | Stores decimal numbers with precision. |
| Char | Holds a single character. |
| Varchar | Stores variable-length strings. |
| Numeric | Decimal numbers with specific precision. |
| Float | Single-precision floating-point numbers. |
| Double | Double-precision floating-point numbers. |
| SmallInt | Smaller range integers. |
| BigInt | Larger range integers. |
| Blob | Binary data (e.g., images, files). |

## 4. Functions and Their Purpose

The DinoDB system includes several core functions that manage user privileges and ensure data type compatibility.  
These functions are designed to enhance the system's security and reliability:

- \*\*ListGrandUser\*\*: Lists the current permissions of a specified user.  
- \*\*ChangeGrand\*\*: Updates a user's privileges in the system.  
- \*\*checkcompatiblegrant\*\*: Verifies if a user has the necessary permissions to perform a specific action.  
- \*\*check\_user\_for\_grant\*\*: Checks if a user is registered in the database with privileges.  
- \*\*checkValueCompatibility\*\*: Ensures that the data type of a value matches the expected column type.

## 5. Files Overview and Their Roles

The DinoDB project is divided into multiple files, each serving a specific purpose in the system's architecture:

- \*\*granduser.cpp\*\*: Contains functions for managing user privileges, including listing, updating, and verifying permissions.  
- \*\*granduser.h\*\*: Defines the constants and structures for various privileges.  
- \*\*dbstruktur.cpp\*\*: Manages data type definitions and performs compatibility checks for database columns and values.