Databases and CIA

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GenCyber Workshop

Agenda

- Database definition
- Database management systems
- CIA
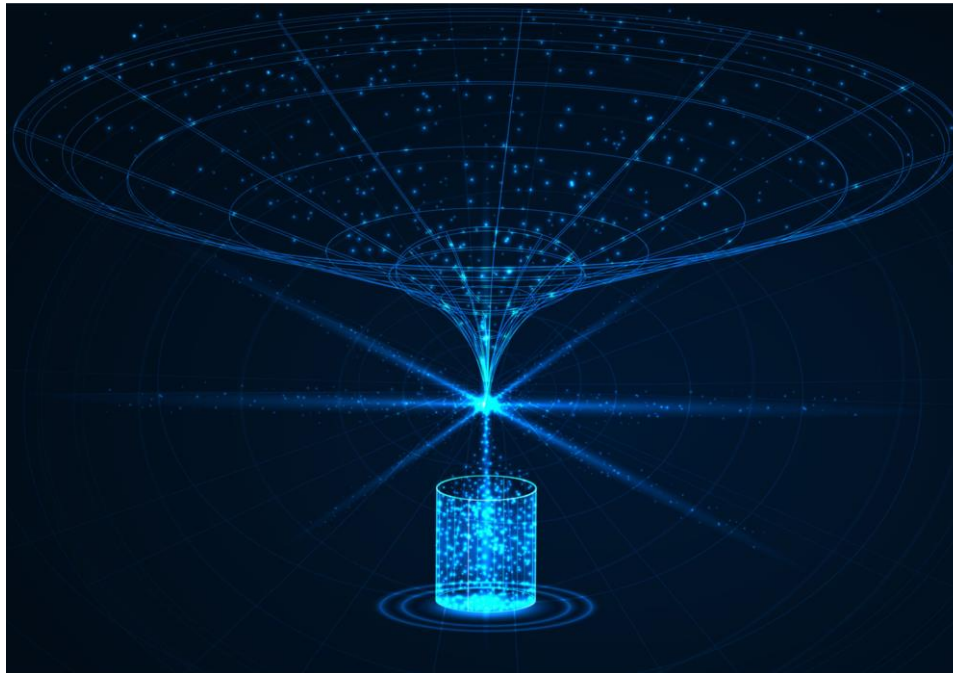 - Confidentiality
  - Integrity
  - Availability

Learning Objectives

- Obtain a general understanding of database concepts
- Understand what databases can be used for
- Explain how CIA protects data

Database Definition

- A database is an organized collection of structured information, or data, typically stored electronically in a computer system

Database Definition

- The data or information for the database are often stored in tables.
- Tables are uniquely identified by their names and are comprised of columns and rows.
  - Columns contain the column name, data type, and any other attributes for the column.
  - Rows contain the records or data for the columns.

id	first_name	last_name	dept_name
1	John	Doe	Sales
2	Bush	Lily	Markting
3	David	Dave	Finance
4	Mary	Jane	Accounting
5	Jonatha	Josh	Warehouses
6	Mateo	More	Sales

Database Management Systems

- A database management system (DBMS) is the software that interacts with end users, applications, and the database itself to capture and analyze the data
- Some popular DBMS include
  - MySQL
  - Microsoft Access
  - Oracle
  - PostgreSQL
  - dBASE

Database Management Systems

- Database management systems have an extraordinary number of practical applications
  - Banking
    - information about employees, salaries, payroll, deduction, generation of paychecks, etc.
  - Airlines
    - reservations and schedule information
  - Universities
    - student information, course registrations, colleges and grades
  - Telecommunications
    - keep call records, monthly bills, maintaining balances, etc.

Database Management Systems

- Some more examples
  - Finance
    - storing information about stock, sales, and purchases of financial instruments like stocks and bonds
  - Sales
    - storing customer, product & sales information
  - Manufacturing
    - management of supply chain and for tracking production of items; inventory status in warehouses
  - HR Management
    - information about employees, salaries, payroll, deduction, generation of paychecks, etc.

CIA

- No, not the Central Intelligence Agency!
- CIA stands for…
  - Confidentiality
  - Integrity
  - Availability

WE'RE WITH THE CIA.

CIA - Confidentiality

- Confidentiality means that data, objects and resources are protected from unauthorized viewing and other access
  - Most information in a database has some level of sensitivity. This means that we want to protect it from unauthorized access

CIA - Integrity

- Integrity means that data is protected from unauthorized changes to ensure that it is reliable and correct
  - The need to protect information includes both data that is stored on systems and data that is transmitted between systems
  - it is not only necessary to control access at the system level, but to further ensure that system users are only able to alter information that they are legitimately authorized to alter

CIA - Availability

- Availability means that authorized users have access to the systems and the resources they need
  - In order for an information system to be useful it must be available to authorized users
  - Availability measures protect timely and uninterrupted access to the system

Resources

- What is a Database?
  https://www.oracle.com/database/what-is-database/
- What is DBMS? Application, Types, Example, Advantages
  https://www.guru99.com/what-is-dbms.html
- Confidentiality, Integrity And Availability – The CIA Triad
  https://www.certmike.com/confidentiality-integrity-and-availability-the-cia-triad/

Activity

Please complete the databases and CIA activity