شُروع اَللہ کے پاک نام سے جو بڑا مہر بان نہایت رحم والا ہے

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Database Systems

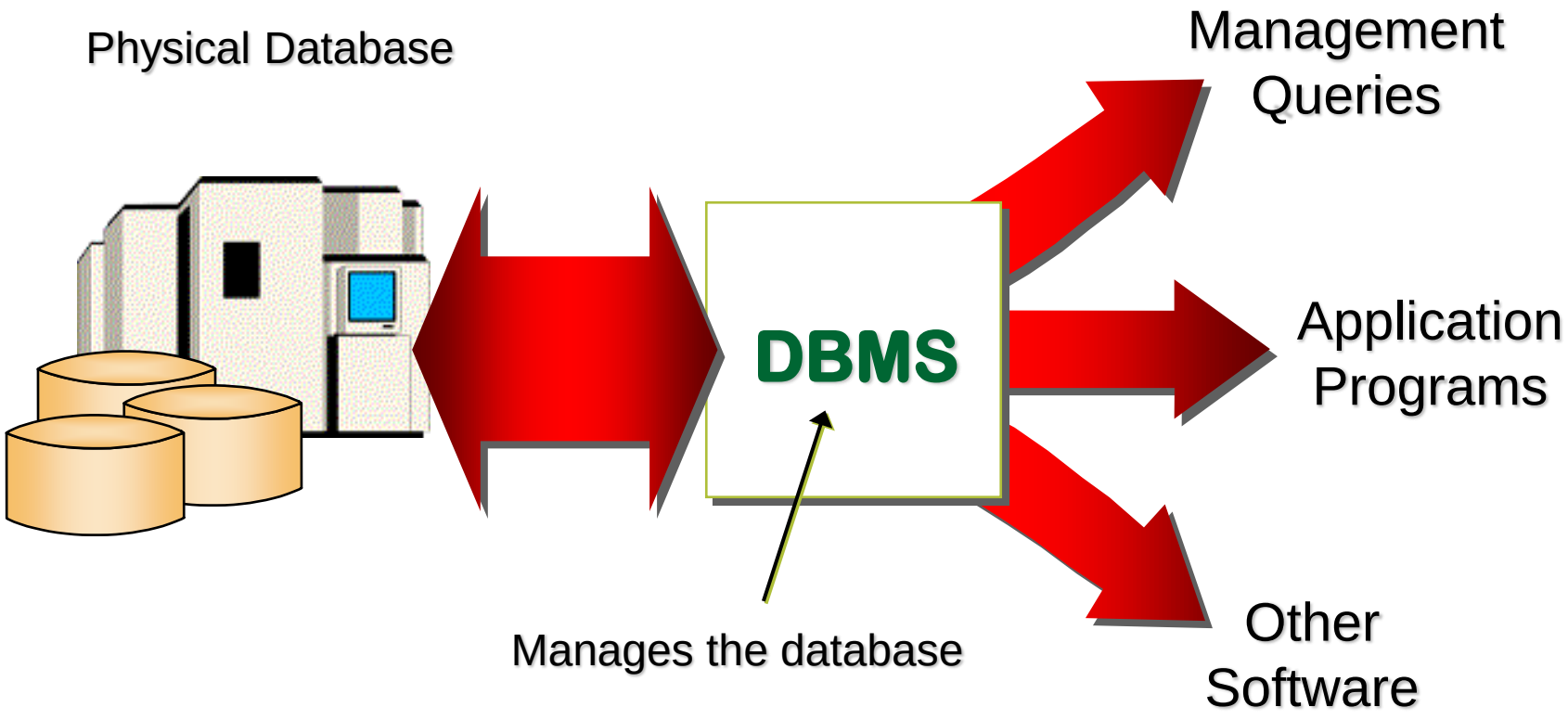
Lecture 8

Functions of DBMS, DBMS Architecture and Metadata

Recall Lecture 7

- HDBS (Hierarchical)
- NWDB (Network)
- OODB (Object Orientated)
- RDB (Relational)
- ORDB (Object Relational)

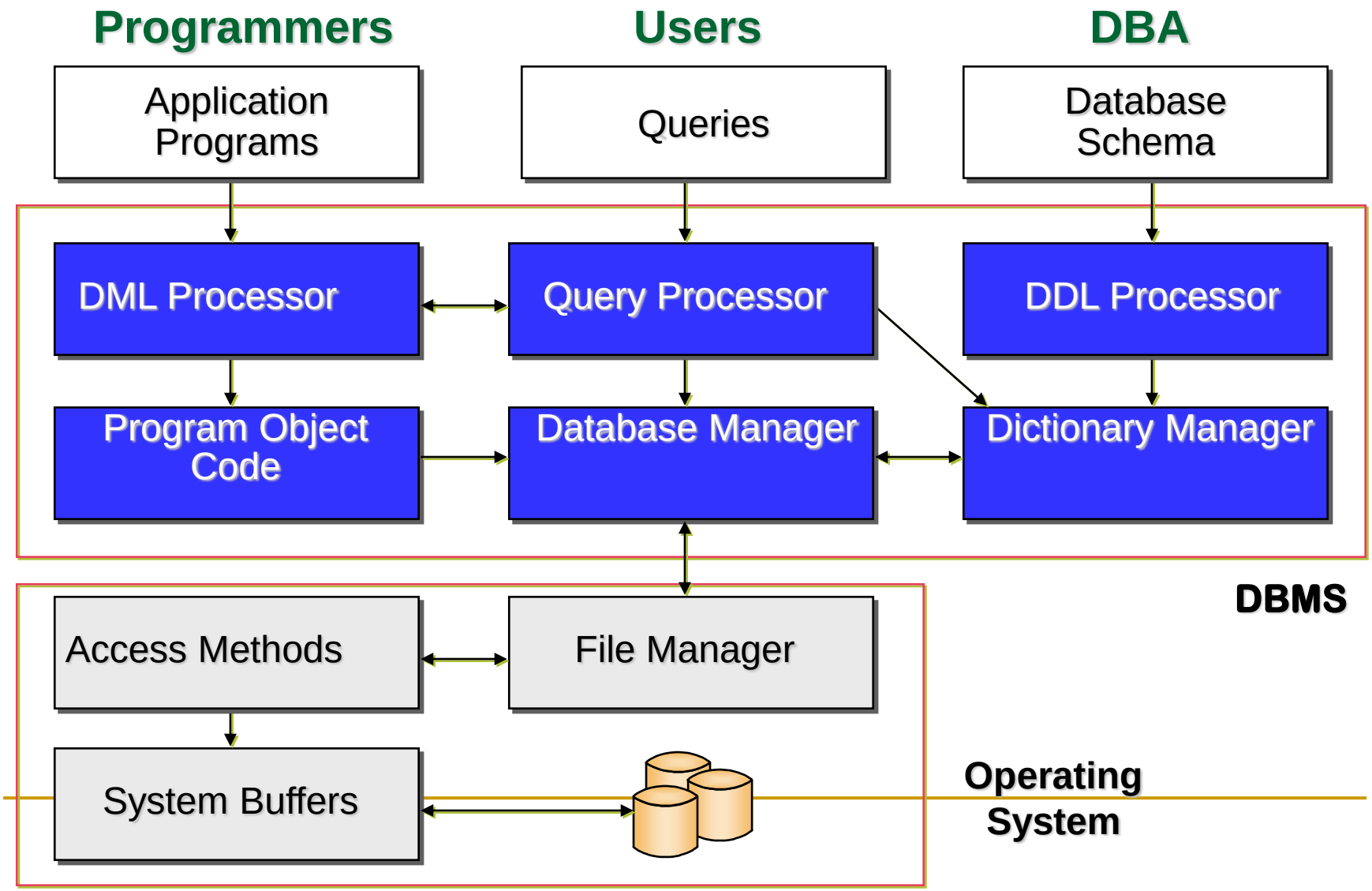
Database


Physical Database
Management Queries
DBMS
Application Programs
Manages the database
Other Software

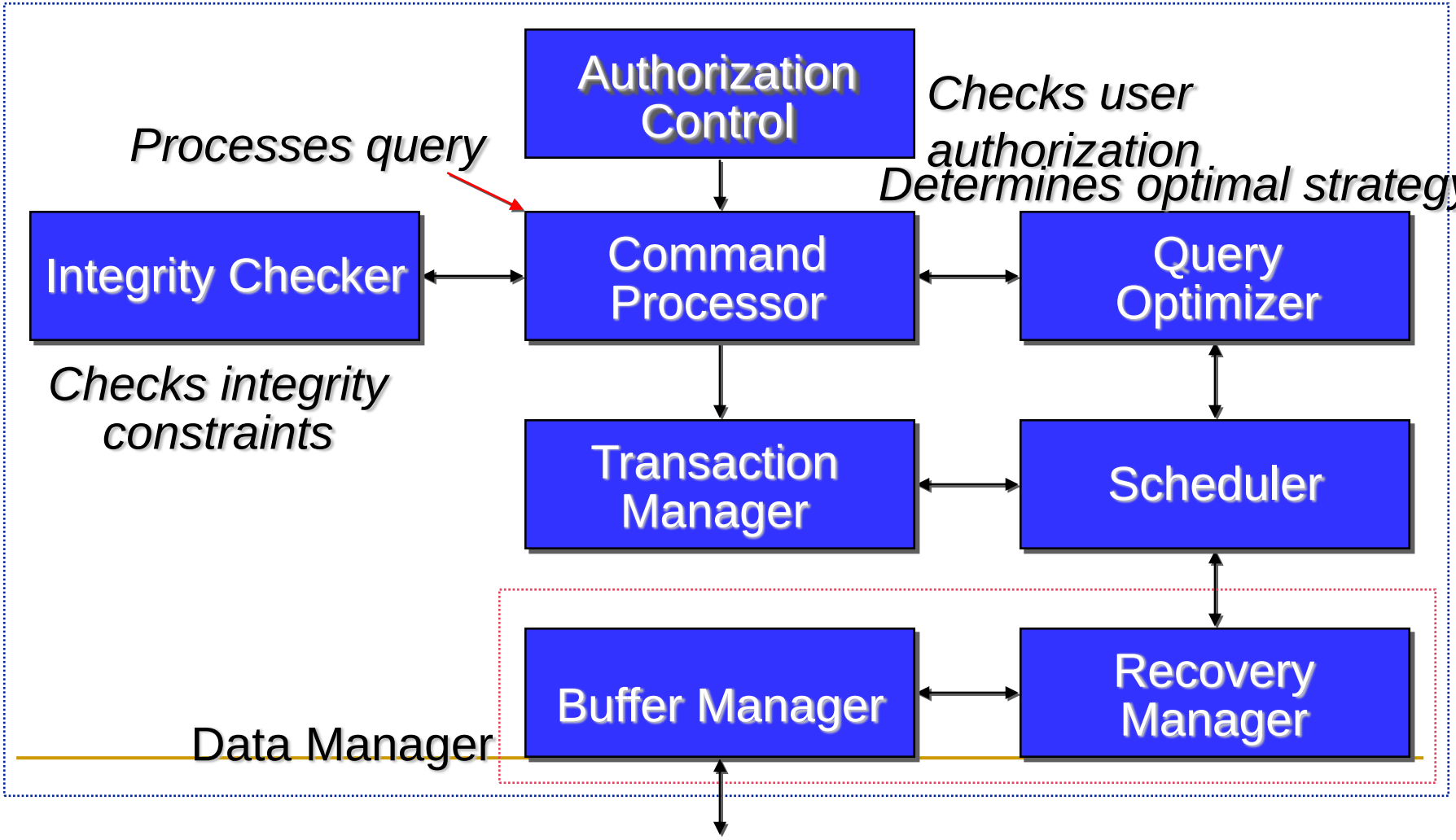
Functions of a DBMS

- Data storage, retrieval and update
- User-accessible catalog
- Transaction support
- Concurrency control services
- Recovery services
- Authorization services
- Support for data communications
- Integrity services
- Services to promote data independence
- Utility services

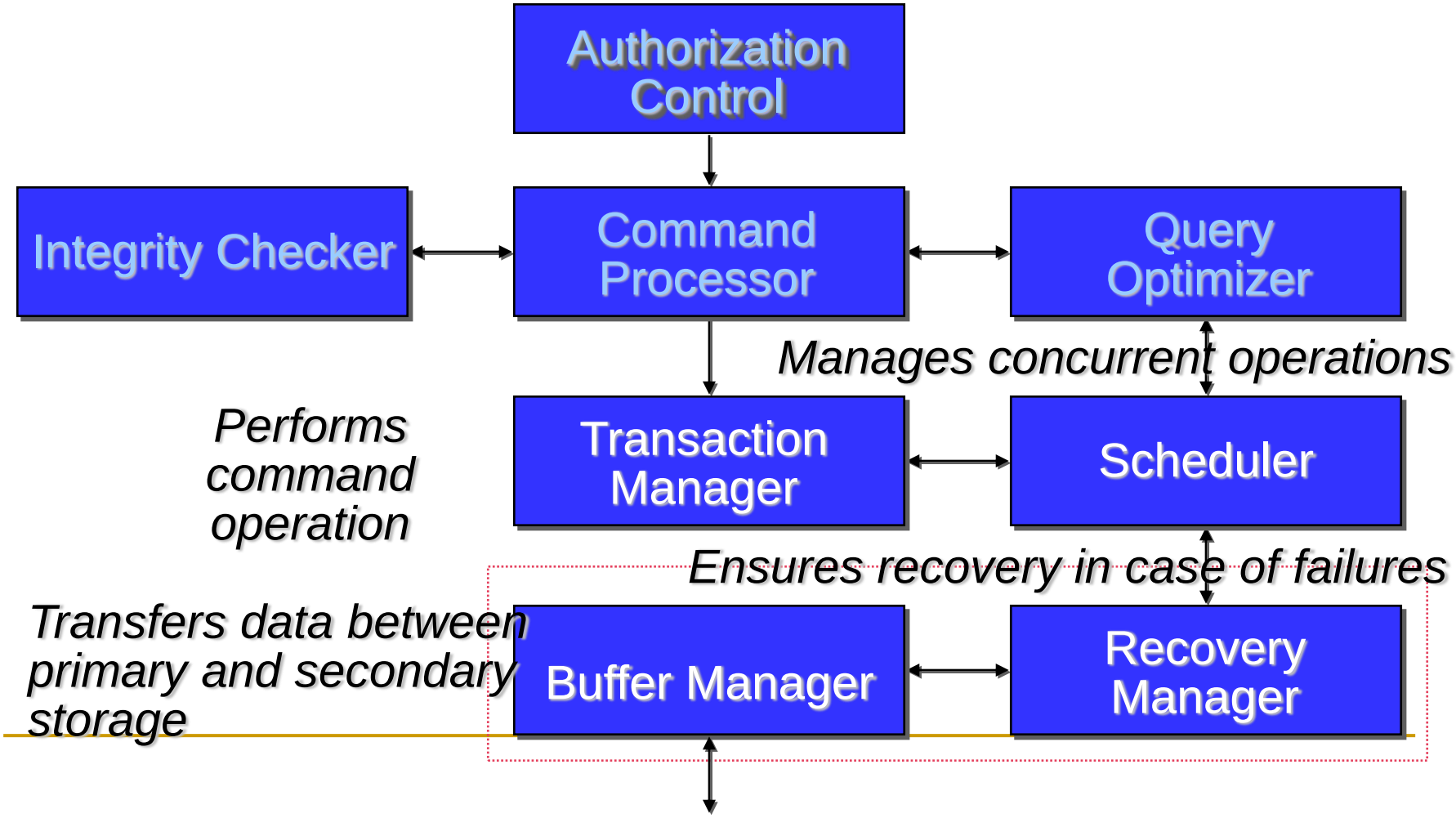
DBMS Architecture



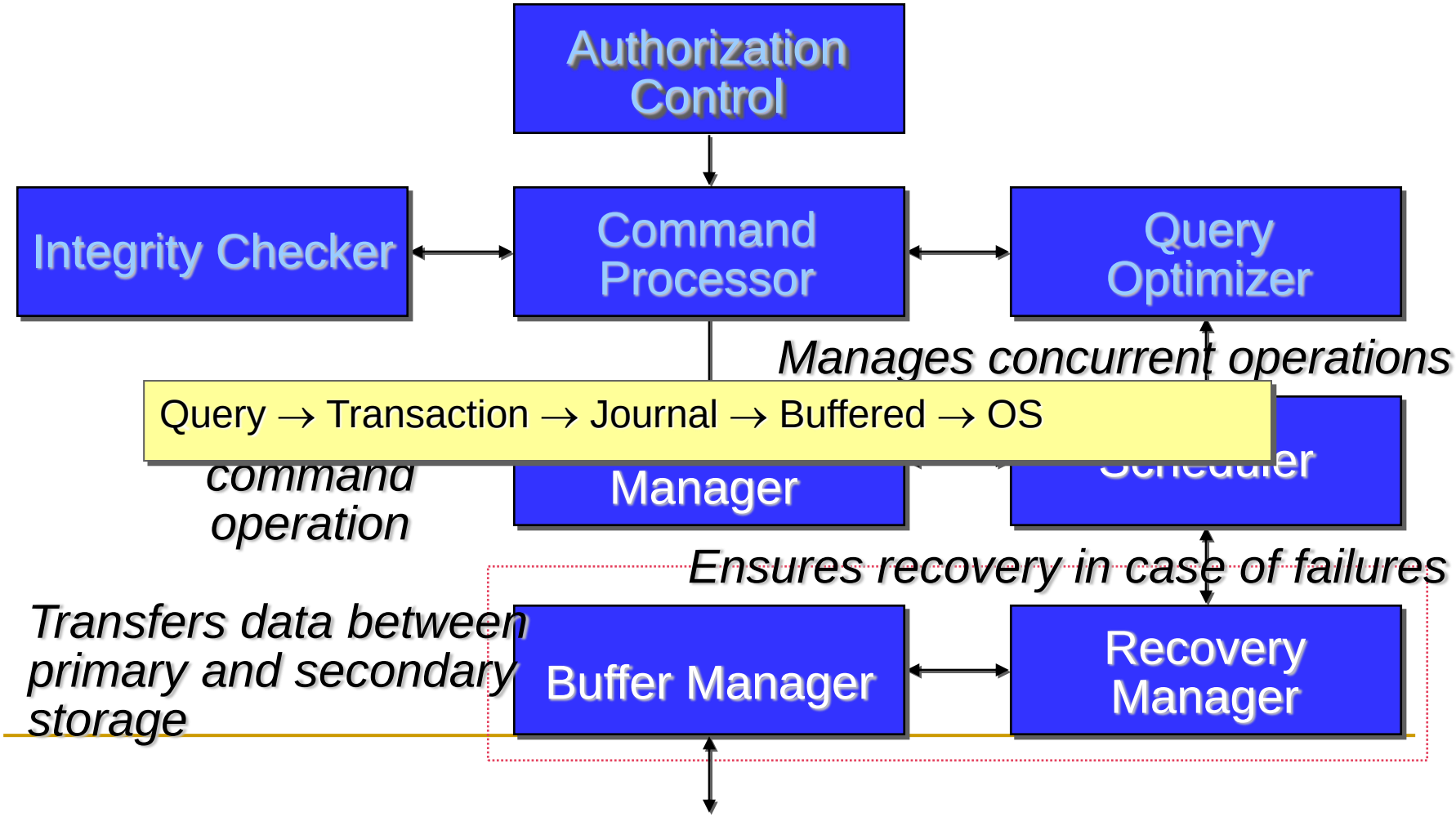
Database Manager



Database Manager Architecture

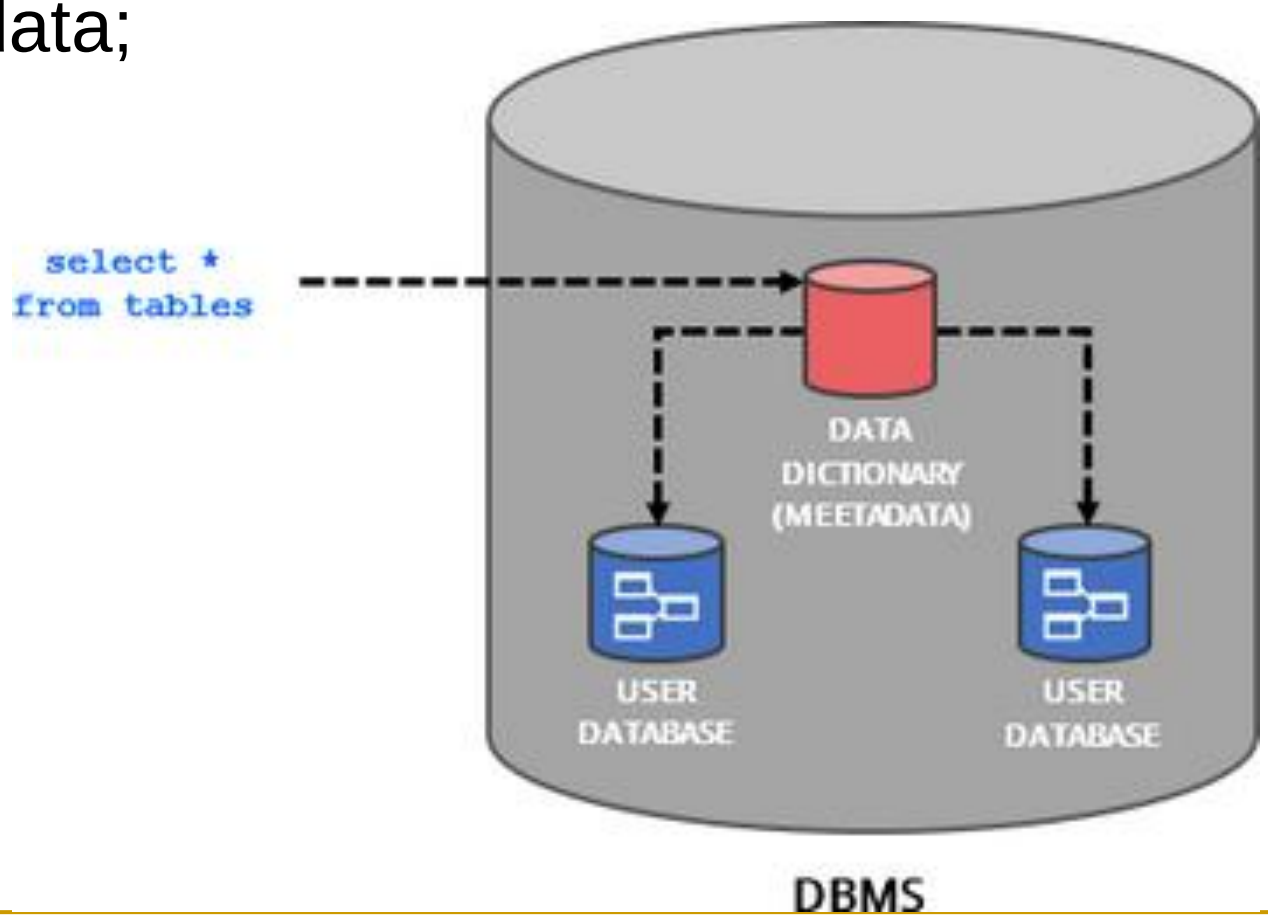


Database Manager Architecture



Metadata in DBMS

Metadata is the value that leads us to the actual data;



Types of Metadata

- **Technical Metadata**
  - This type of metadata defines database system names, tables names, table size, data types, values, and attributes.
    - Further technical metadata also includes some constraints such as foreign key, primary key, and indices.
- **Business Metadata**
  - It consists of the ownership of data, changing policies, business rules and regulations, and other business details.
    - This type of metadata is related to a particular business.
- **Operational Metadata**
  - It consists of the ownership of data, changing policies, business rules and regulations, and other business details.
    - This type of metadata is related to a particular business.
- **Descriptive Metadata**
  - Descriptive metadata describes any file, folder, book, image, or video.
    - It may include details of data such as title, author, date, size, author name, published on, and similarly others

System Catalog (Metadata)

- A repository of information describing the data in the database (metadata)
- Stores
  - Names of users authorized to access the DBMS
  - Names of all data items in the database
    - Types and sizes
    - Constraints
  - Data items and authorization

Metadata (Example)

emlployee_id	first_name	last_name	nin	department_id
44	Simon	Martinez	HH 45 09 73 D	1
45	Thomas	Goldstein	SA 75 35 42 B	2
46	Eugene	Cornelsen	NE 22 63 82	2
47	Andrew	Petculescu	XY 29 87 61 A	1
48	Ruth	Stadick	MA 12 89 36 A	15
49	Barry	Scardelis	AT 20 73 18	2
50	Sidney	Hunter	HW 12 94 21 C	6
51	Jeffrey	Evans	LX 13 26 39 B	6
52	Doris	Berndt	YA 49 88 11 A	3
53	Diane	Eaton	BE 08 74 68 A	1
54	Bonnie	Hall	WW 53 77 68 A	15
55	Taylor	Li	ZE 55 22 80 B	1

Data

Metadata

Column	Data Type	Description
emlployee_id	int	Primary key of a table
first_name	nvarchar(50)	Employee first name
last_name	nvarchar(50)	Employee last name
nin	nvarchar(15)	National Identification Number
position	nvarchar(50)	Current postion title, e.g. Secretary
department_id	int	Employee deparmtnet. Ref: Departmetns
gender	char(1)	M = Male, F = Female, Null = unknown
employment_start_date	date	Start date of employment in organization.
employment_end_date	date	Employment end date. Null if employee sti

In Next Lecture

- Relational Model in depth

Thanks