

DBA & Database Lingkungan Hidup

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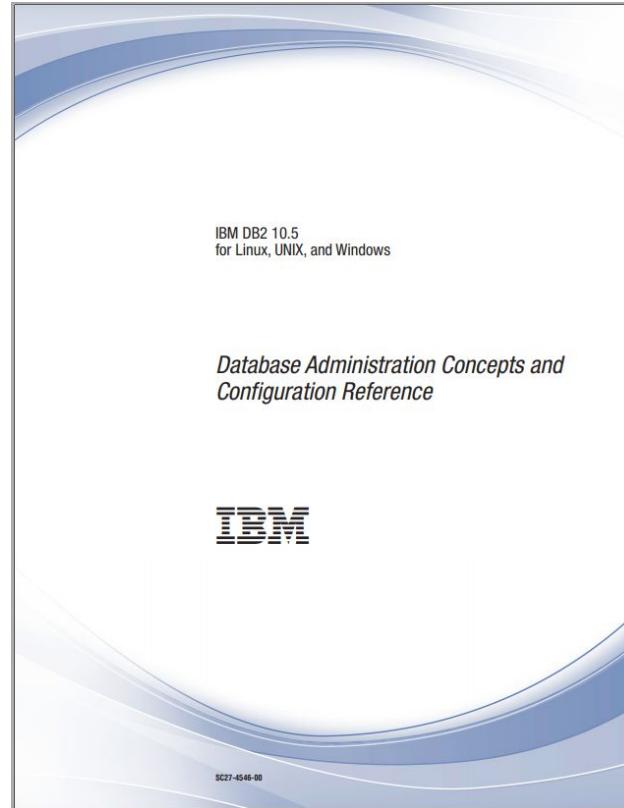
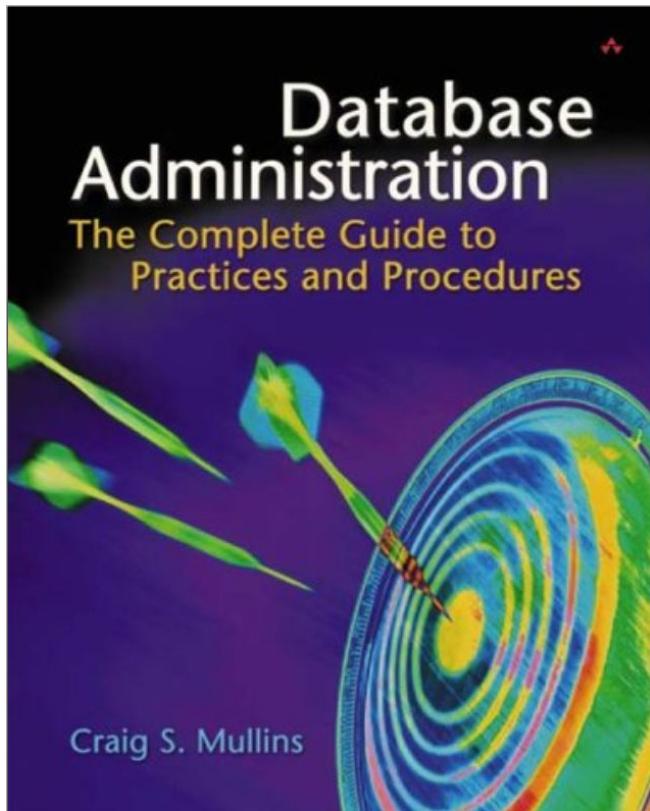
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Materi

- DBA & Database Environment
- Database & data placement
- Database object
- Data movement & Distribution
- Query languages for XML
- Database security
- Backup & Recovery
- Locking & Concurrency
- Application & data base performance
- Data Availability

Books



NILAI*

- TUGAS : 10%
- QUIS : 10%
- UTS : 15%
- UAS : 15%
- Final Project : 15%
- KEHADIRAN : 10%
- PRAKTIKUM : 25%
- Nilai kelas : penambahan diakhir

*dalam pertimbangan team teaching

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Database Administrator (DBA)

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• Salary Survey

Base Salary, Job Title

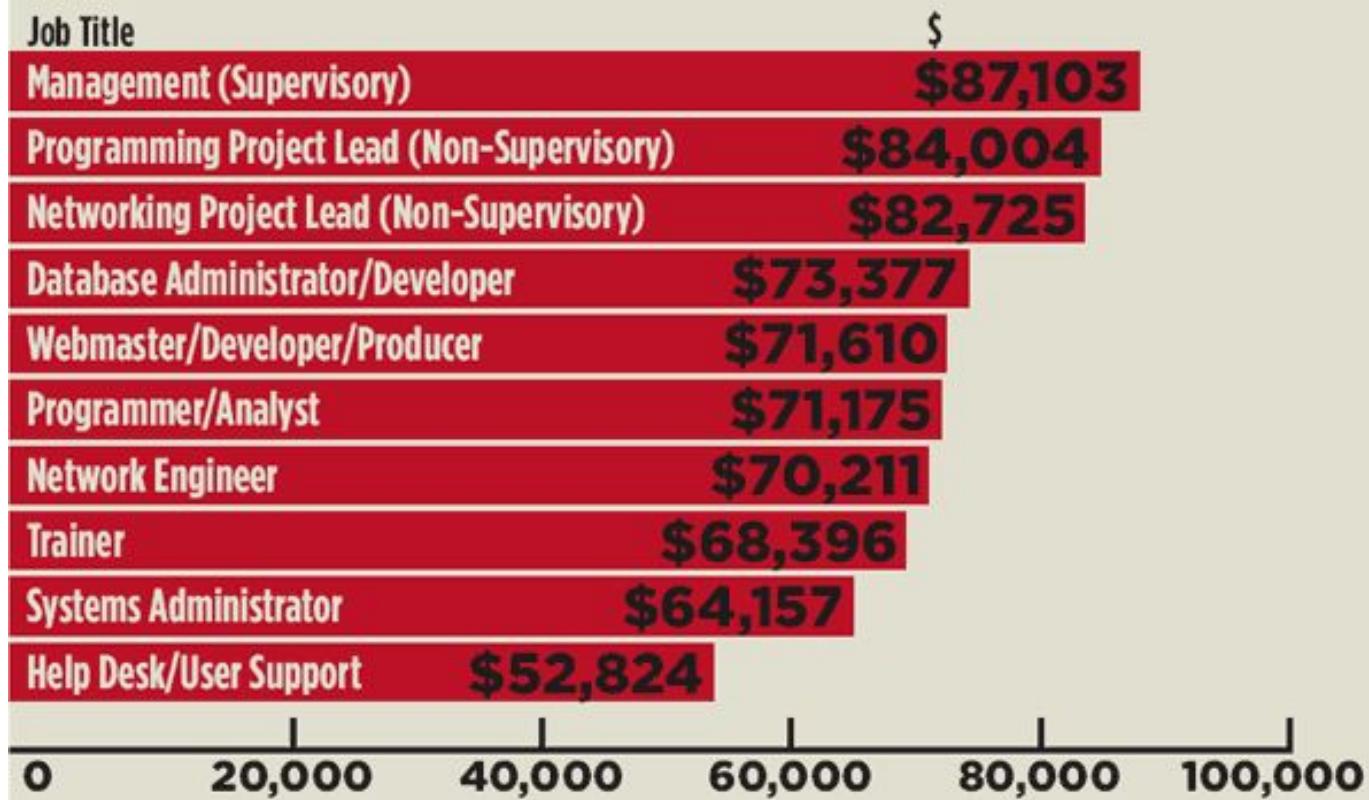


Chart 3. Job title plays a major factor in salaries. Respondent salaries show that, unlike last year's anomaly (in 2006, programmers took the top spot), management salaries come back out on top.

The Primary Tasks of DBA

- One of the primary tasks associated with the job of DBA is the process of choosing and installing a DBMS
- Unfortunately, many business executives and IT professionals without database management backgrounds assume that once the DBMS is installed, the bulk of the work is done
- The truth is, choosing and installing the DBMS is hardly the most difficult part of a DBA's job
- Establishing a usable database environment requires a great deal of skill, knowledge, and consideration

M ANAGEMENT D ISIPLIN DBA



Menghadapi masalah

Fokus terhadap masalah besar yang dihadapi



Menghindari masalah

Mengembangkan dan menerapkan **Blueprint'** untuk mengaplikasikan database



T TANYA DBA

Database Design

- transform a logical data model into a physical database implementation
- database design and implementation will enable a useful database for the applications and clients

Performance Monitoring & Tuning

- optimization of resource usage to increase throughput and minimize contention.

DB Availability

- keeping the DBMS up and running
- data is available whenever applications and clients require it

Data Integrity

- A database must be designed to store the correct data in the correct way without that data becoming damaged or corrupted

DBMS Release Migration

- keeping the DBMS running and up-to-date is an ongoing effort that will consume many DBA cycles

Backup and Recovery

- The DBA must be prepared to recover data to a usable point, no matter what the cause, and to do so as quickly as possible

DB Security & Authorization

Defining the Organization's DBMS Strategy

- The process of choosing a suitable DBMS for enterprise database management is not as difficult as it used to be
- The DBA group should be empowered to make the DBMS decisions for the organization

Choosing a DBMS

- When choosing a DBMS, it is wise to select a product from a tier-1 vendor as listed in Table 2-1.

Table 2-1. Tier-1 DBMS Vendors

DBMS vendor	DBMS product
IBM Corporation New Orchard Road Armonk, NY 10504 Phone: (914) 499-1900	DB2 Universal Database
Oracle Corporation 500 Oracle Parkway Redwood Shores, CA 94065 Phone: (650) 506-7000	Oracle
Microsoft Corporation One Microsoft Way Redmond, WA 98052 Phone: (425) 882-8080	SQL Server

Choosing a DBMS, Cont'd...

- After the big three come Sybase and Informix. Table 2-2 lists these tier-2 DBMS vendors

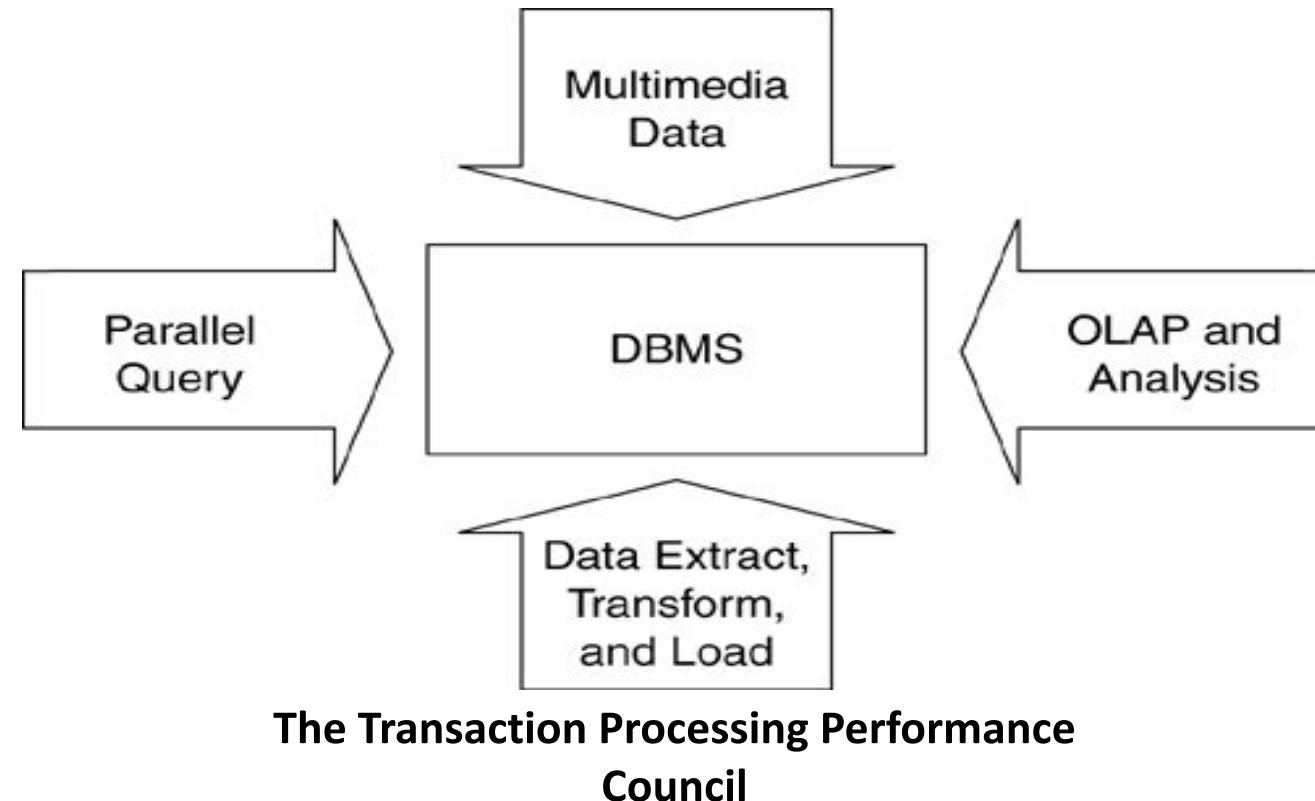
Table 2-2. Tier-2 DBMS Vendors	
DBMS vendor	DBMS product
Informix Software, Inc. 50 Washington Street Westborough, MA 01581 Phone: (508) 366-3888	Informix Dynamic Server
Sybase Inc. 6475 Christie Ave. Emeryville, CA 94608 Phone: (510) 922-3500	Adaptive Server Enterprise

- Choosing any of the lower-tier candidates involves incurring additional risk

When choosing a DBMS, be sure to consider each of these factors:

- *Operating system support*
- *Type of organization*
- *Benchmarks.*
- *Scalability.*
- *Availability of supporting software tools*
- *Technicians.*
- *Cost of Ownership*
- *Release schedule*
- *Reference customers*

Convergence of features and functionality in DBMS software

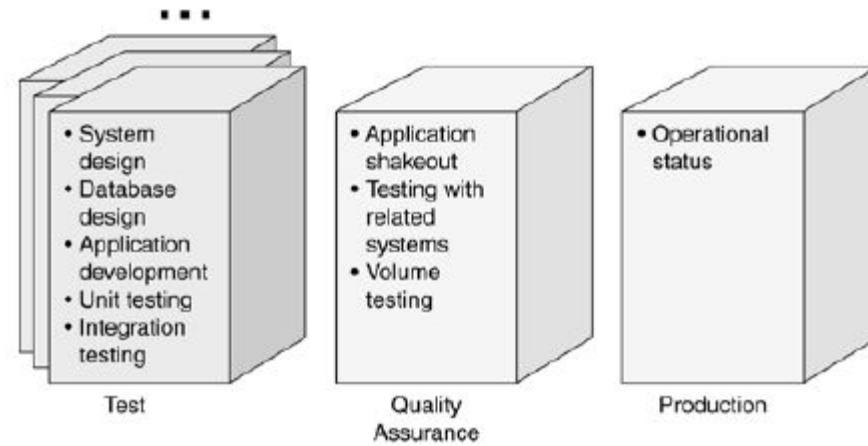


The TPC defines four benchmarks

- TPC-C: Planned production workload in a transaction environment
- TPC-H: Ad hoc processing where transactions are not known and predefined
- TPC-R: Business reporting in a decision report environment
- TPC-W: Transaction processing over the Web

Additional information and in-depth definitions of these benchmarks can be found at the TPC Web site at <http://www.tpc.org>.

DB Environment



DBMS Architectures

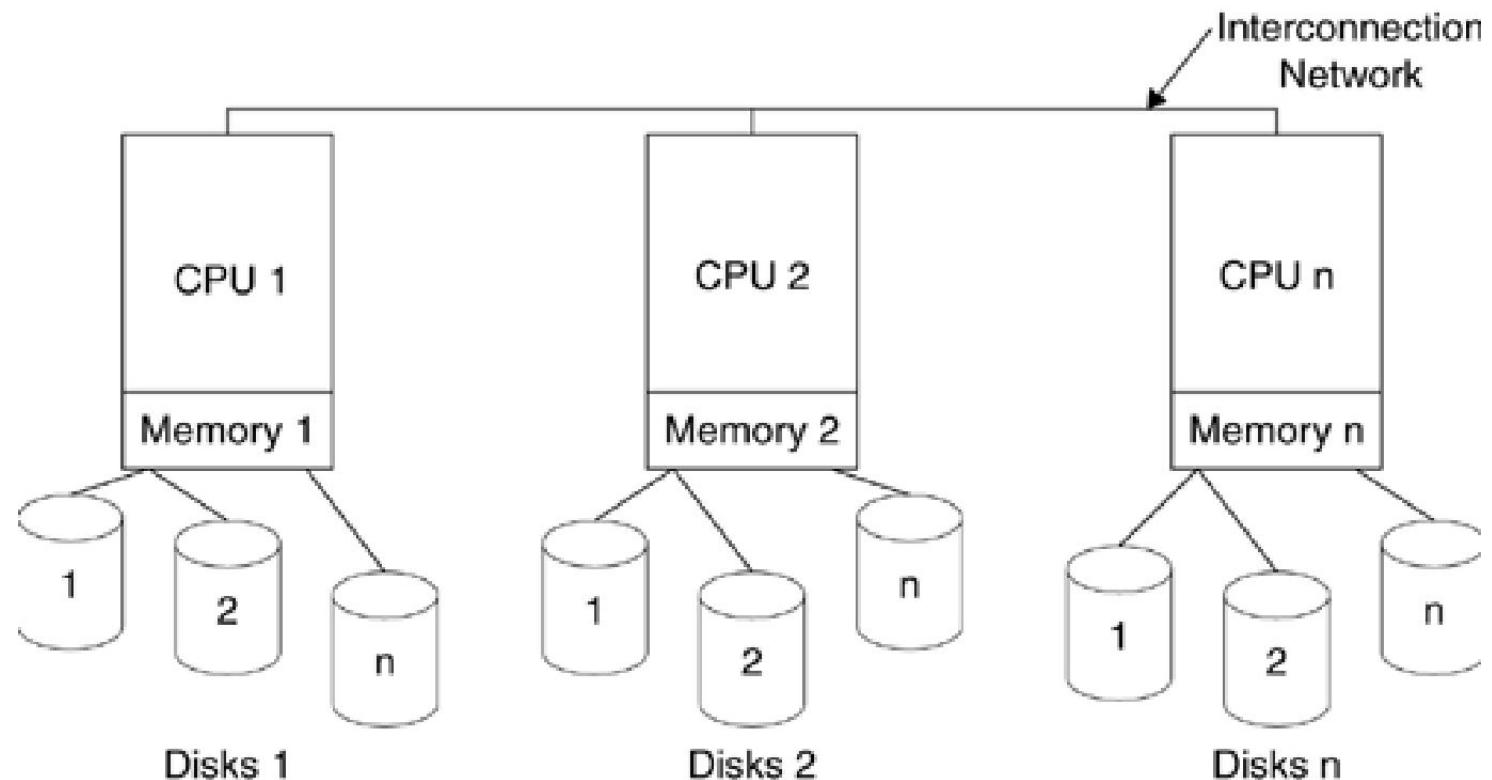
- The supporting architecture for the DBMS environment is very critical to the success of the database applications.
- Four levels of DBMS architecture are available:
 - enterprise,
 - departmental,
 - personal, and
 - mobile.

DBMS Clustering

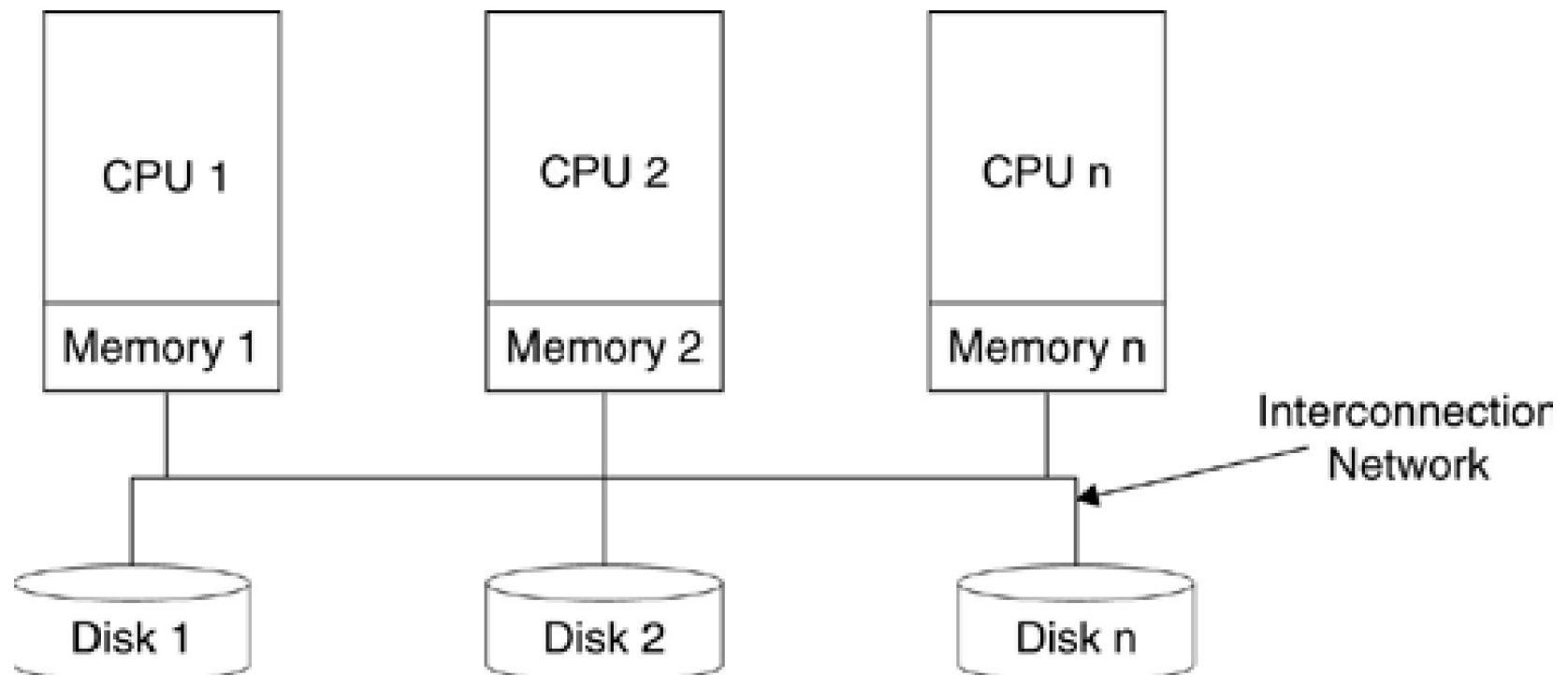
- *Clustering* is the use of multiple "independent" computing systems working together as a single, highly available system.
- A modern DBMS offers clustering support to enhance availability and scalability
- The two predominant architectures for clustering are *shared-disk* and *shared-nothing*.

Shared-nothing

- The main advantage of shared-nothing clustering is scalability.



shared-disk



Comparison of Shared-Disk and Shared-Nothing Architectures

Table 2-3. Comparison of Shared-Disk and Shared-Nothing Architectures

Shared-disk	Shared-nothing
Quick adaptability to changing workloads	Can exploit simpler, cheaper hardware
High availability	Almost unlimited scalability
Performs best in a heavy read environment	Works well in a high-volume, read-write environment
Data need not be partitioned	Data is partitioned across the cluster

DBMS Installation Basics

- **Hardware Requirements**
- **Storage Requirements**
- **Memory Requirements**
- **Configuring the DBMS**
- **Connecting the DBMS to Supporting Infrastructure Software**
- **Installation Verification**

Hardware Requirements

- Every DBMS has a basic CPU requirement
- Choose the correct DBMS for your needs and match your hardware to the requirements of the DBMS

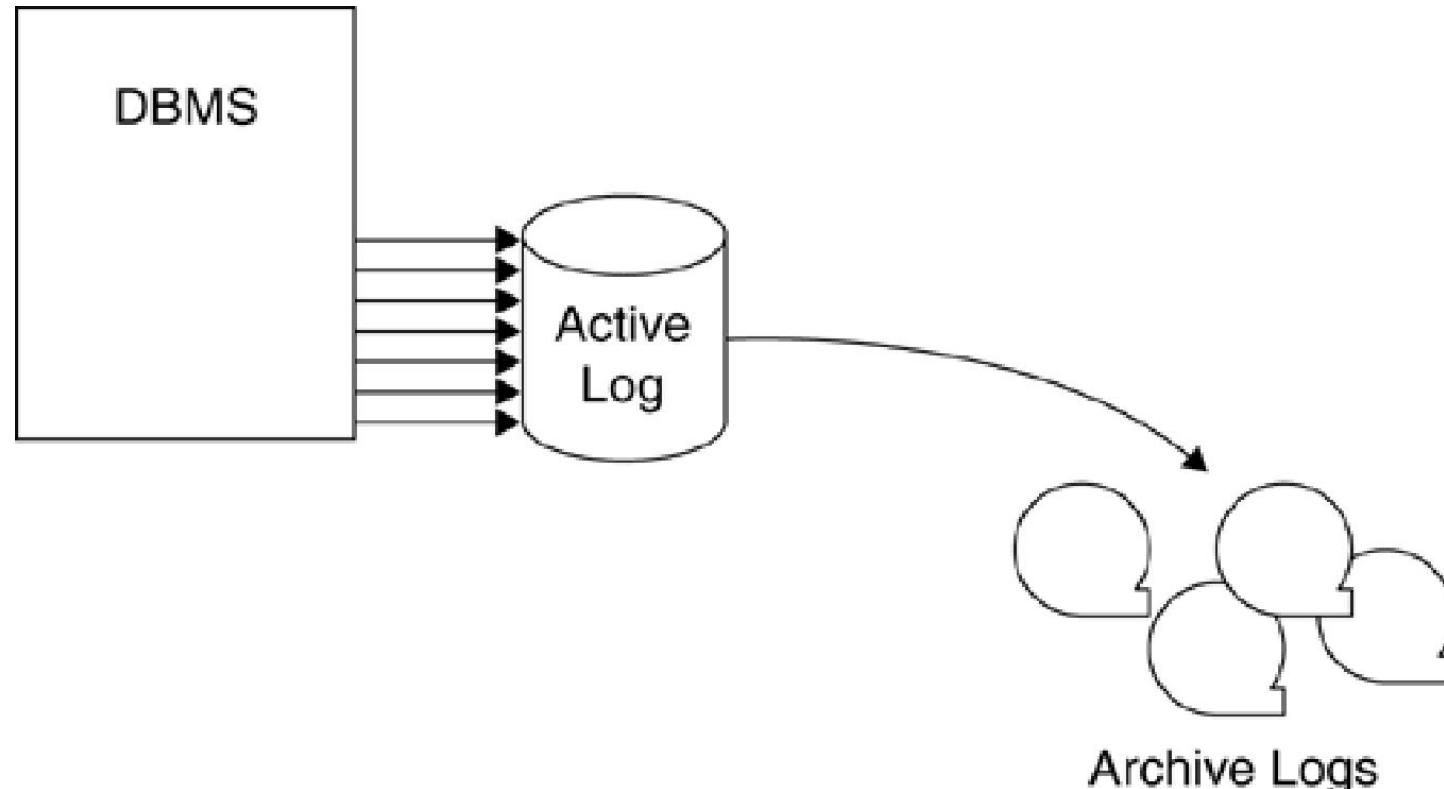
Storage Requirements

- A DBMS requires disk storage to run
- A DBMS will use disk storage for the indexes to be defined on the databases as well as for the following items :
 - The system catalog or data dictionary used by the DBMS to manage and track databases and related information. The more database objects you plan to create, the larger the amount of storage required by the system catalog.
 - Any other system databases required by the DBMS, for example, to support distributed connections or management tools.
 - Log files that record all changes made to every database. This includes active logs, archive logs, rollback segments, and any other type of change log required by the DBMS.
 - Startup or control files that must be accessed by the DBMS when it is started or initialized.
 - Work files used by the DBMS to sort data or for other processing needs.

Storage Requirements, Cont'd...

- A DBMS will use disk storage for the indexes to be defined on the databases as well as for the following items :
 - Default databases used by the DBMS for system structures or as a default catchall for new database objects as they are created.
 - Temporary database structures used by the DBMS (or by applications accessing databases) for transient data that is not required to be persistent but needs reserved storage during operations.
 - System dump and error processing files.
 - DBA databases used for administration, monitoring, and tuning—for example, DBA databases used for testing new releases, migration scripts, and so on.

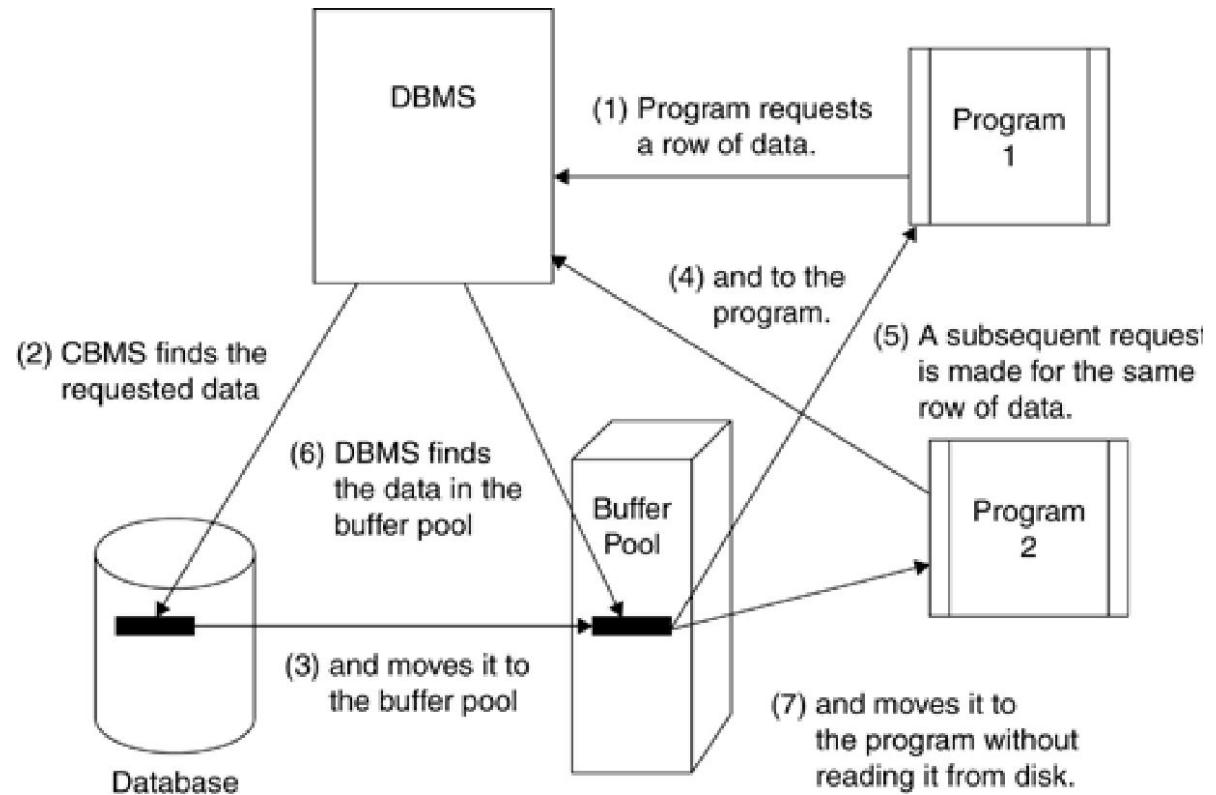
Storage Requirements : Log offloading



Memory Requirements

- A DBMS requires memory for basic functionality and will use it for most internal processes such as maintaining the system global area and performing many DBMS tasks
- A DBMS requires a significant amount of memory to cache data in memory structures in order to avoid I/O.
- Reading data from a disk storage device is always more expensive and slower than moving the data around in memory

Memory Requirements: Buffer pool (or data cache)



Summary

- Comprehensive advance planning is required to create an effective database environment
- Nevertheless, setting up the database environment is only the beginning. Once it is set up, you will need to actively manage the database environment to ensure that databases are created properly, used correctly, and managed for performance and availability