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Data Center Infrastructure

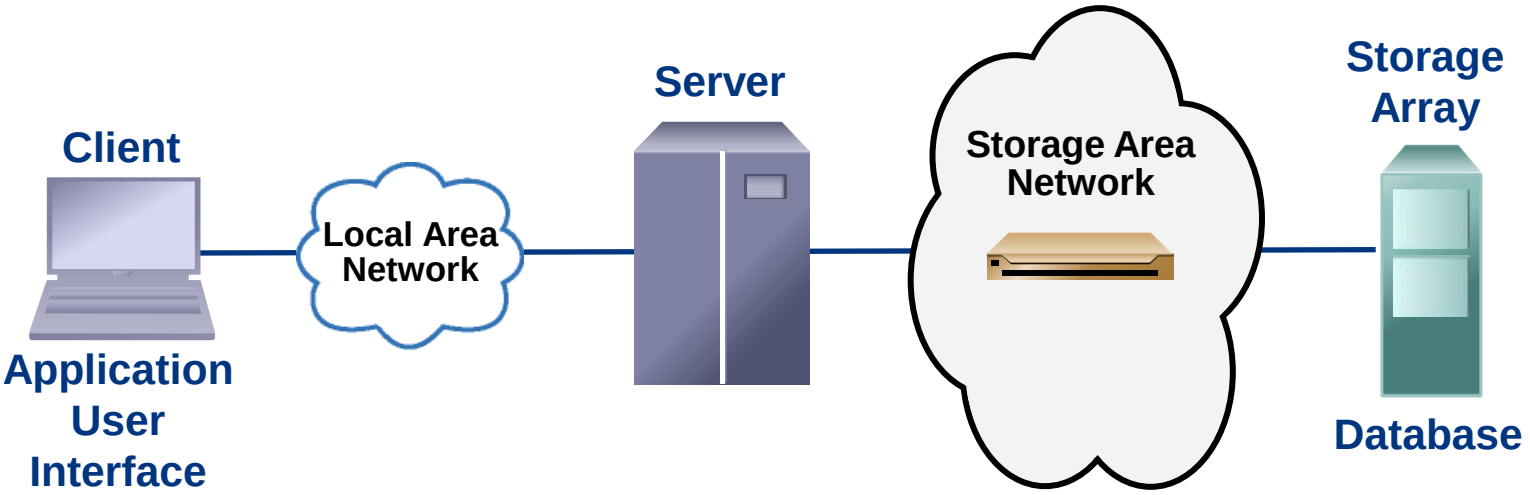
EMC Global Education

Module 1.3

The Core Elements

- Applications
- Databases – Database Management System (DBMS) and the physical and logical storage of data
- Servers/Operating Systems
- Networks
- Storage Arrays

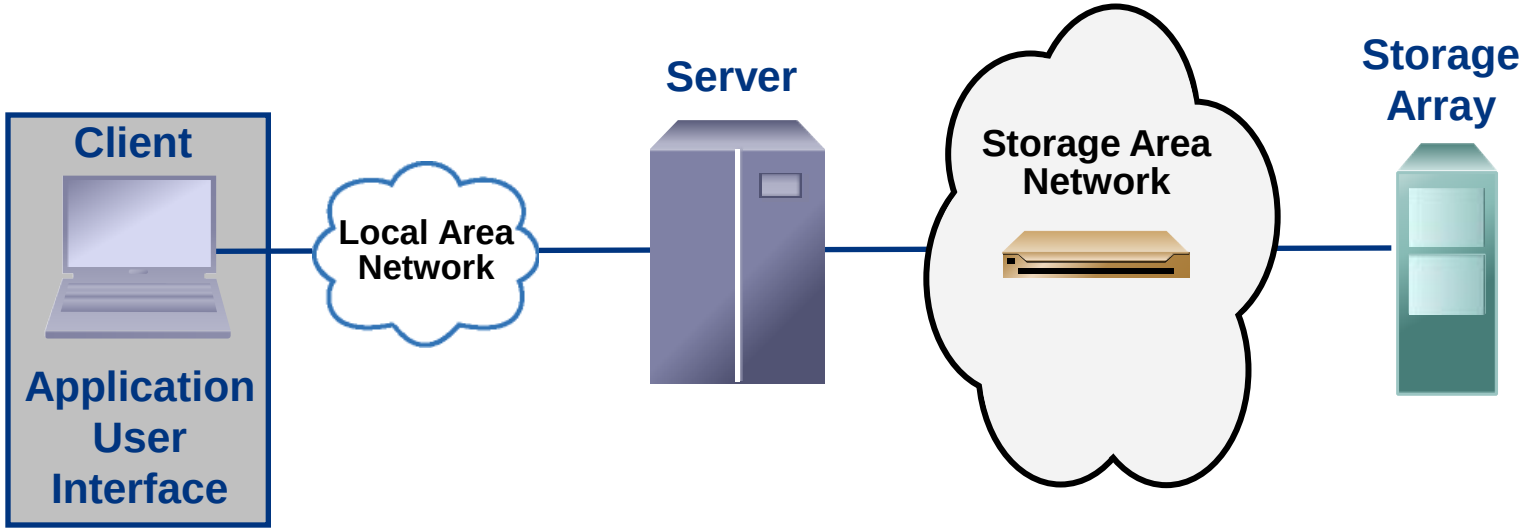
An Example



Consider an order processing system consisting of:

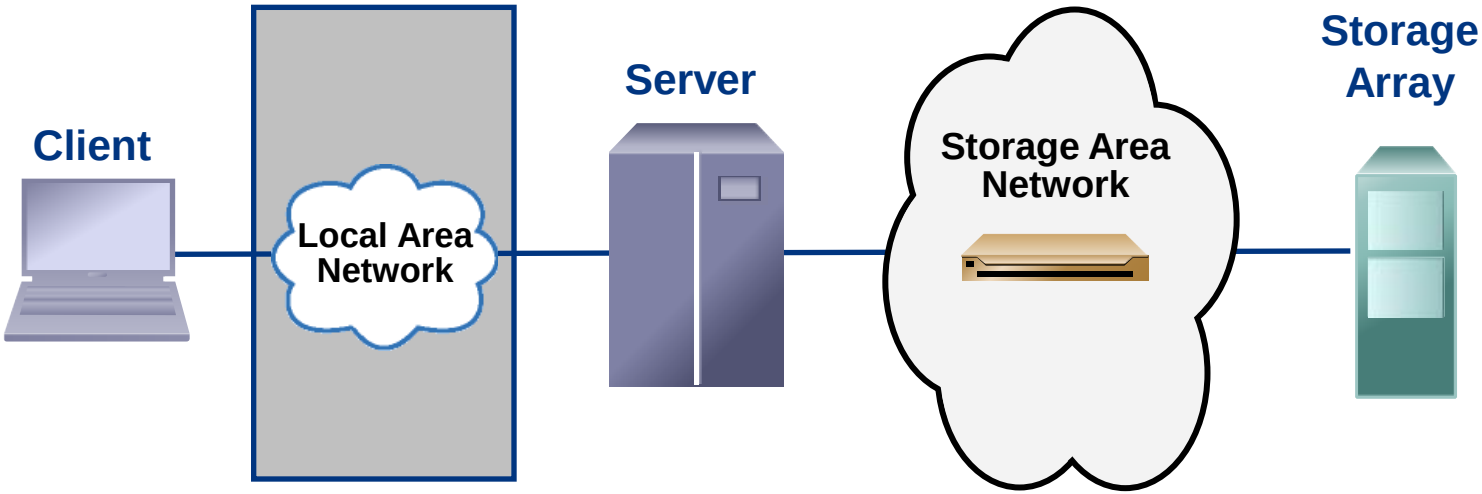
- Application for order entry.
- Database Management System (DBMS) to store customer and product information.
- Server/Operating System on which the Application and Database programs are run.
- Networks that provide
  - Connectivity between Clients and the Application/Database Server
  - Connectivity between the Server and the Storage system.
- Storage Array.

An Example ..Closer Look



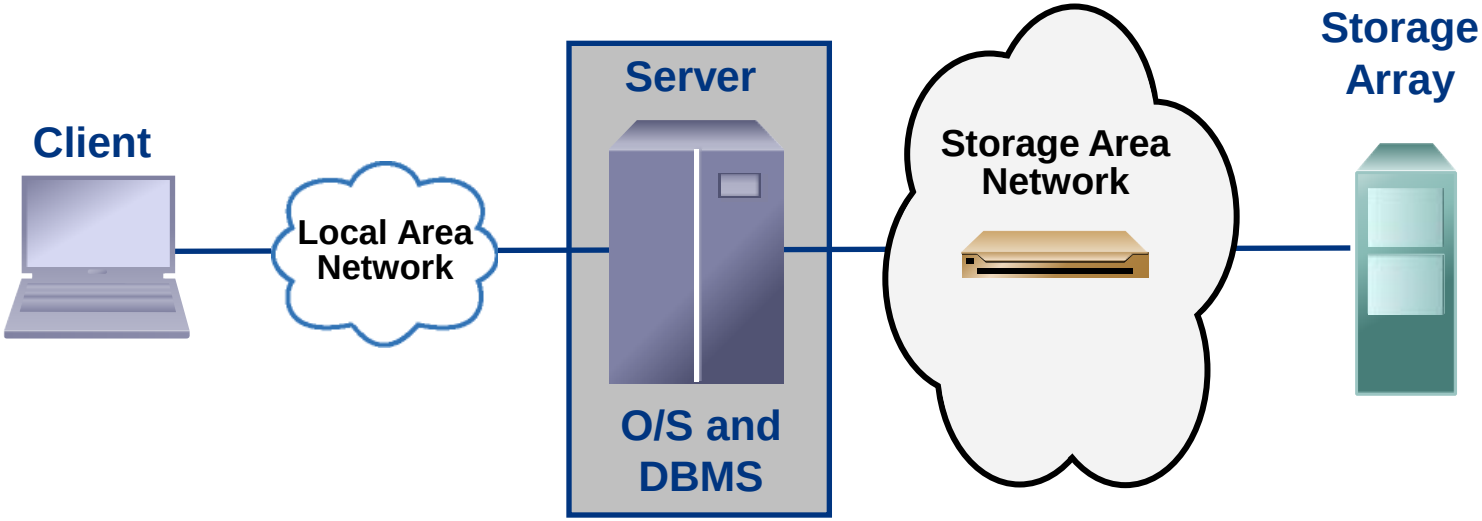
- A customer order is entered via the Application User Interface on a client.

An Example ..Closer Look



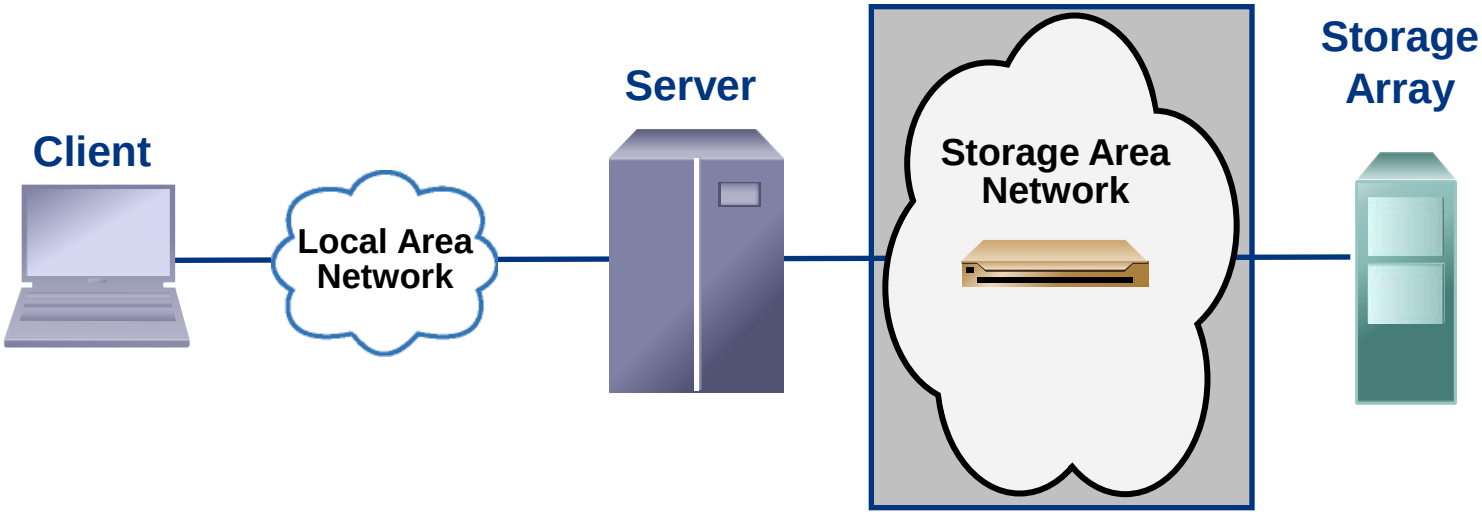
- A customer order is entered via the Application User Interface on a client
- **The client accesses the Server over a Local Area Network.**

An Example ..Closer Look



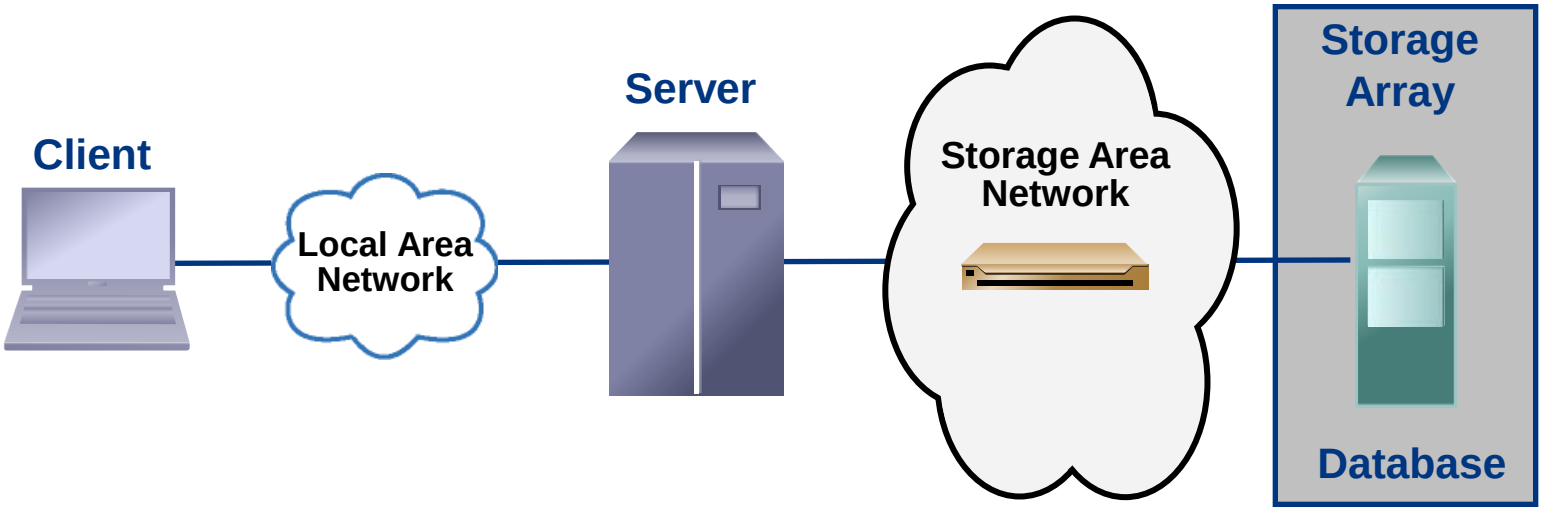
- A DBMS uses the operating system on the server to read and write this data to the physical location on a disk.

An Example ..Closer Look



- A DBMS uses the operating system on the server to read and write this data to the physical location on disk.
- **A Network provides the communication link between the server and the storage array, and transports the read/write commands and data between the server and the storage array.**

An Example ..Closer Look



- A DBMS uses the operating system on the server to read and write this data to the physical location on disk.
- A Network provides the communication link between the client and the server, and transports the read/write commands and data between the server and the storage array.
- **A storage array receives the read/write commands and data from the server and performs the necessary operations to store the data on the physical disks.**

An Example.. Optimal Order Processing

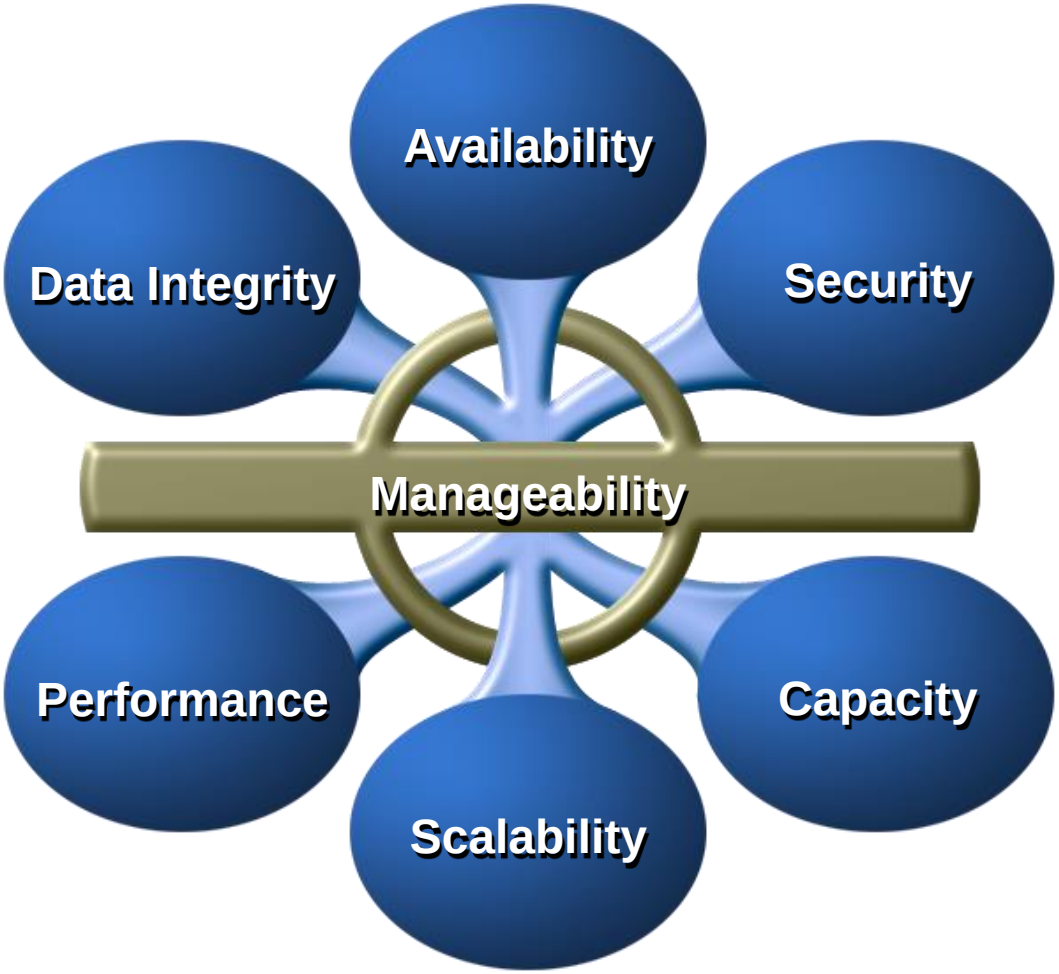
- The Application should be optimized for fast interaction with the DBMS.
- The tables in the Database should be constructed with care so that the number of read/write operations can be minimized.
- The Server should have sufficient CPU and memory resources to satisfy Application and DBMS needs.
- The Networks should provide fast communication between Client and Server, as well as Server and Storage Array.
- The Storage Array should service the read/write requests from the Server for optimal performance.

An Example.. A Final Look at Data Access

When the DBMS receives a request from the Application:

- It first searches the Server memory. If data is found there, the operation takes, perhaps, a millisecond.
- If not, it then uses the Operating System to request the data from the Storage Array.
- Dedicated high speed networks transport this request to the Storage Array.
- Intelligent Storage Arrays can deliver the requested data within a few milliseconds. They are also typically configured to protect data in the event of drive failures.

Key Requirements of Storage Systems



Some Constraints to Meeting the Requirements

Constraints include:

- Cost
- Physical Environment
- Maintenance and Support
- Compliance – Regulatory & Legal
- Hardware and Software infrastructure
- Interoperability and Compatibility

Management Activities

Data Center management activities include:

- Provisioning/Capacity/Resource Planning
- Monitoring
- Reporting

Monitoring

- Performance
- Security
- Data Protection
- Utilization

Reporting

- Utilization
- Performance
- Internal Chargeback system for cost recovery

Provisioning

- Capacity
- Security
- Performance