DDBMS RELIABILITY

- presentation by
Nusrat.Mohammed.Hanif
Subject : Distributed Database
M.Sc (Comp.Sci) -I
Roll no : 4

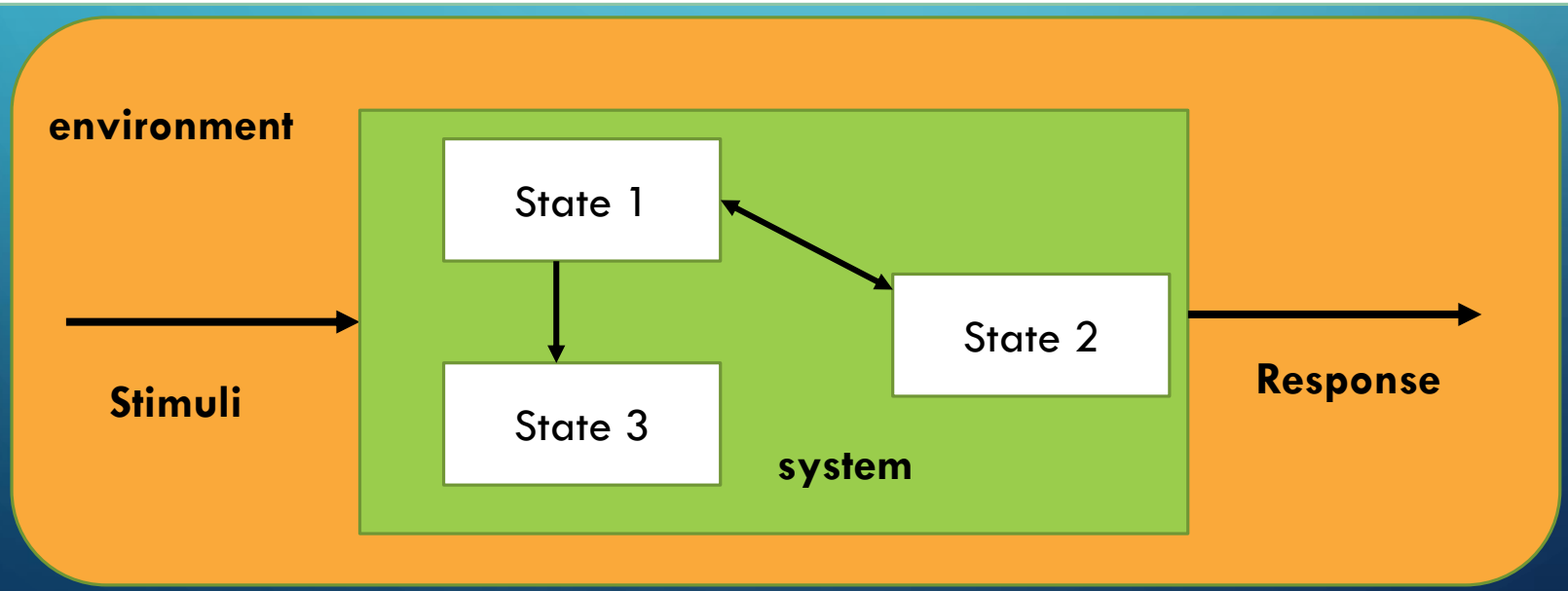
❖Introduction to Distributed DB Reliability

1. **Reliability : that you can trust**
2. **Reliability of DDBMS refers to atomicity and durability properties of transactions.**
3. **DDBMS is strongly dependent on reliability of hardware and software components that makes up the distributed environment.**
4. **When components of distributed environment fails , a reliable DDBMS should be able to continue executing users requests .**

❖Reliability Concepts and Measure

1. System , State and failure :

System refers to a mechanism that consists of a collection of components and interacts with its environment with a recognizable pattern of behavior .



2. Reliability and Availability :

Reliabilty refers to the probability that system does not experience any failures in a given time interval .

- Reliability = Probabilty {0 failure in time [0,t] no failure at t=0 }

Availability A(t) refers to the probability that the system is operational according to its specification at a given point in time t .

- Availability of system can be written as

$$A = \frac{\mu}{(\lambda+\mu)}$$

Where λ is the failure rate and μ is the mean repair time .

❖ Failures and Fault Tolerance in Distributed systems

1. **Reasons for Failure :**

- **90% of all failures are hardware failures.**
- **Most of the software failures are transient(not permanent)**
- **Software failures**
- **OS failures**
- **Failure in application code**
- **Failure in transaction management code.**

2.Basic faults tolerance approaches and techiques:

- A fault is an wrong or incorrect state of hardware or software resulting from failures of components.
- Faults avoidance , fault prevention and fault intolerance which refers to techniques used in the system to make sure that faults are not introduced into the system
- <u>Two types of modules :</u>

1. Fail-stop module :shuts down automatically when detects a fault.
2. Process pairs :it provides fault tolerance by duplicating software

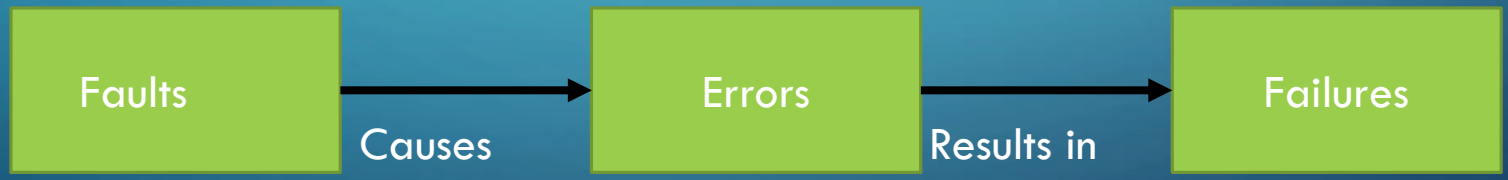


Fig : chain of events leading to system failure