

lec #3

## ② Transparency

ازایان user یعنی system و کل node  
المنه كانت system ما؟

**Transparency**: Hide that processes  
and resources are  
physically distributed across  
multiple computers.

جعل Hide ⑧ حجات من system :

## ① Access

منه لازم يعرف انا جيت  
الresources ازای

## ② Location (availability)

منه لازم يعرف المبرمجين

بين الplatform  
منه لازم

## ③ Migrations

hot migrations

cold migrations

note: the resource could be moved from a node to another or from a system to a system ②

④ Relocation      ال users بيتحركوا من مكان  
للسكان

⑤ Replication (Resource redundancy)

⑥ Concurrency (Resource sharing)  
عندما يستخدم كل واحد من نفس المورد

⑦ Failure → detect + report + recover

⑧ persistence →  
معرفة ال user ال data اطار ال sw  
معلومات ومستخدمين

Important:

Replication transparency → reliability  
+  
Performance



## Scaling Transparency

can expand in scale  
without change to  
the system structure.

→ اجزاء زیادہ قابل Feature کے system میں  
والہ اور مینجمنٹ قابل

- \* performance :
- low cost
  - high speed
  - memory efficiency

=

## ③ Openness

- concerned about extensions and Improvements

- Detailed Interfaces of components  
لازم ہے ہر Interface کی قابلیت

- Integrating New components

لها تعريفات Openness و Scalability مع بعضهما  
قوله واحدة لوصفها فتعبر Scalability

## General definition

determined by the degree to which new  
resources can be added and made  
available for a variety of client programs  
e.g. (web, internet)

Important: ⚠

An open system is a system that can  
connect to other systems and work  
correctly (نزيه و open mix)

Feature of openness و scalability  
والهم عنهما  
منها openness فيها  
(عنهما)

Note: different data representations  
of interface types should be  
resolved.

web جميع النظم system لزم احكام interface



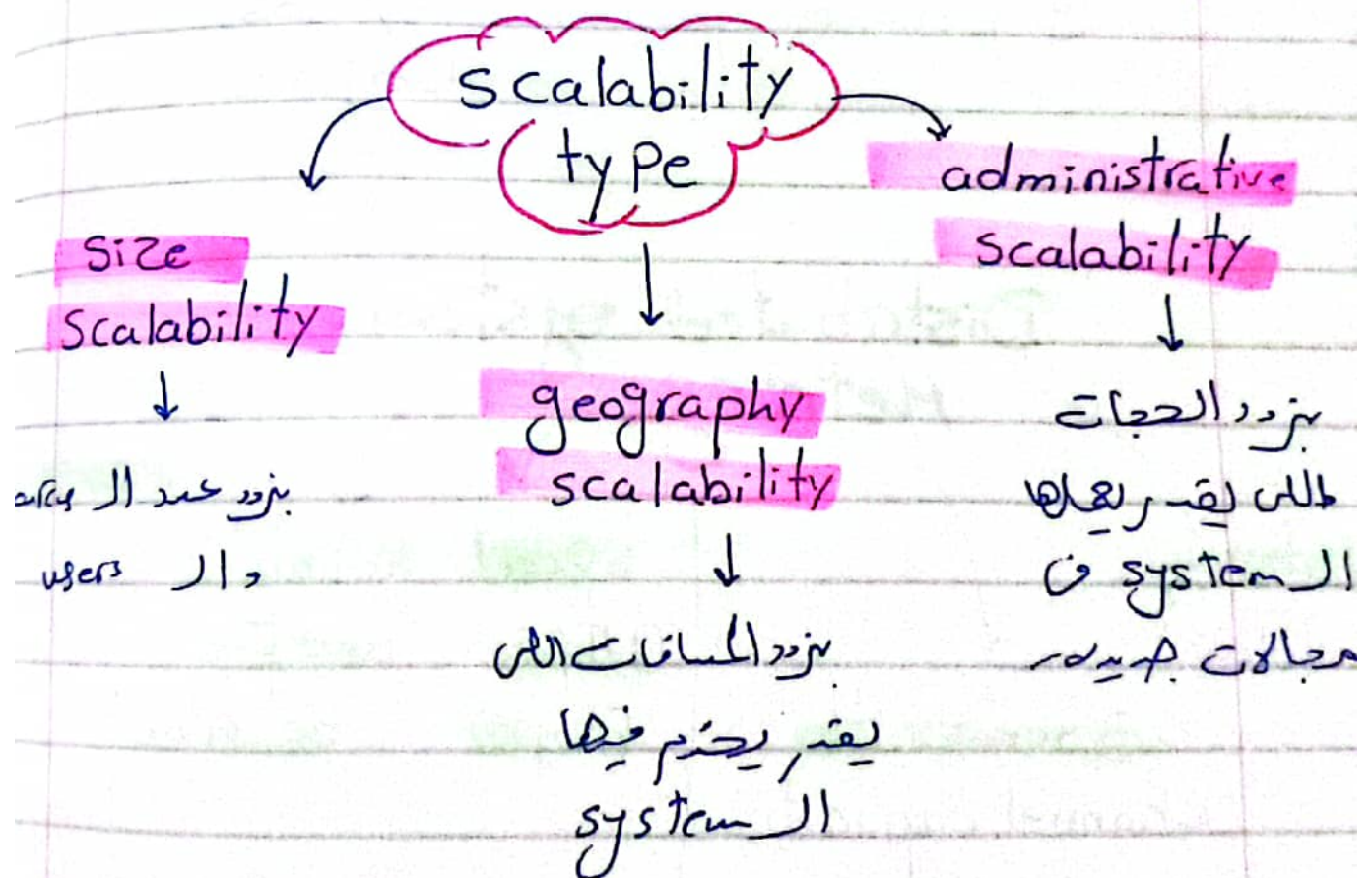
## 4 Scalability

5

→ easy to expand and manage

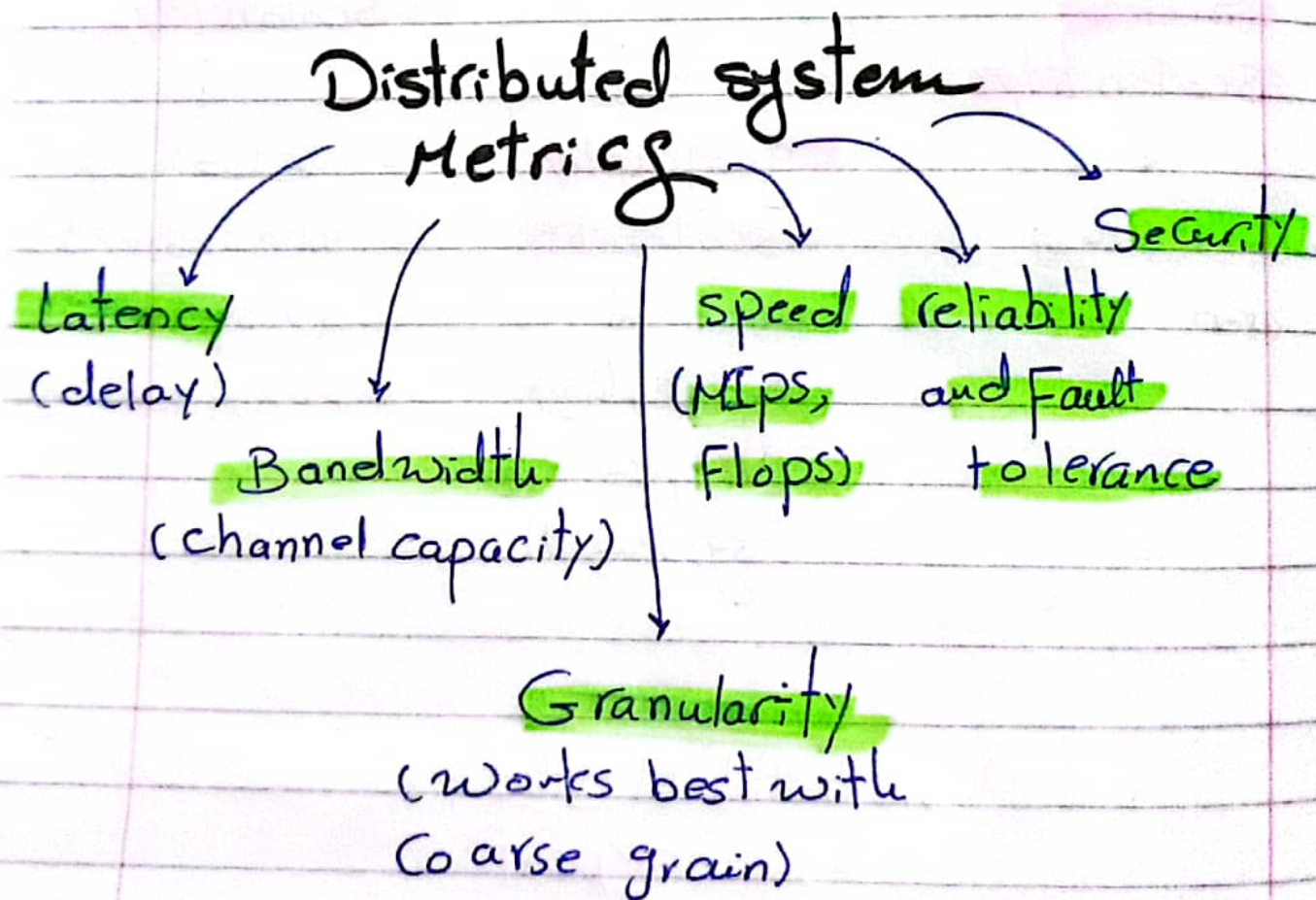
a scalable system will remain effective when there's a significant increase in the number of resources and users.

Scalability ← أهم Feature في cloud



## ⑤ user criteria؟؟

- ① Service / benefits  
عائز يستعمل الخدمة الى النظام بفعالية
- ② easy to use
- ③ Reliability - Security
- ④ Ratio of performance / cost  
مقارنة بين الأداء على حساب التكلفة





7

← جاي مع ال coarse grain mane  
المدققين ال processors ال ال ship

## challenge

☐ Absence of global clock

منه الى ال computers الى خا ال system  
message passing ال ال clock ال ال ال  
asynchronous ال ال

2] Absence of global state.

منه من مخرجاته الى system  
State synchronous

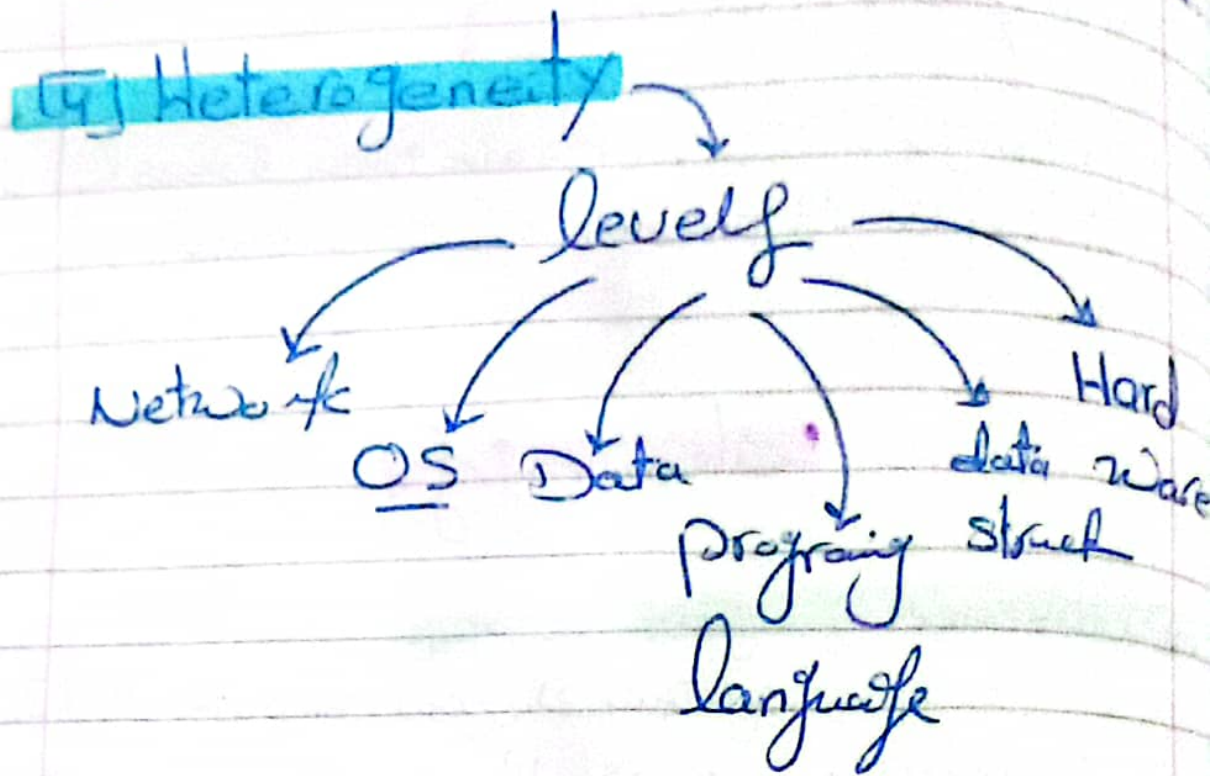
Due to

- ① Concurrency (node ya state machine)
- ② message passing communication.

3) Specific failure mode

node ال واحد  
Failure لاقرا nodes من هتكون

• failure of processes may be undetected ⑧



المiddleware هي Heterogeneity layer  
التي تباع و تبيع ال Heterogeneity layer

CORBA

(Common object request broker Architecture)



acts as a coordinated computational resource

الزمن حبة Middleware في الشبكة هي ال  
transparency



• **MoM**: message oriented middleware  
مختصون على data sharing

• **ORBs**: object request brokers

• **Uniform high level API**

↓  
لها أنواع middleware

**Note**  
لا Challenge الواجهة openess  
Standard interface  
لها Standardization بشكل عام

• **Security**:

- privacy
- Authentication
- Availability
- Trusting
- Authorization.

لفرق  
ما بين  
طريقة  
علينا  
==

# Modelling a distributed system

10

