Database
Data structure

data @1970 RDBMS

internet - @1980

@1991-1995 => java

java => applets

RDBMS ←

@2000 => data burst

load
work
client
data

scaling

Vertical scaling
[UP scaling]

5000

```
2 CPU
4 GB
500GB
```

50000

```
16 CPU
32 GB
12 TB
```

SPOF

Horizontal scaling
[OUT scaling]

node

```
7 CPU
16 GB
2 TB
```
```
7 CPU
16 GB
2 TB
```
```
7 CPU
16 GB
2 TB
```
```
7 CPU
16 GB
2 TB
```
```
7 CPU
16 GB
2 TB
```
```
7 CPU
16 GB
2 TB
```

Cluster = set of computers (nodes) connected in network
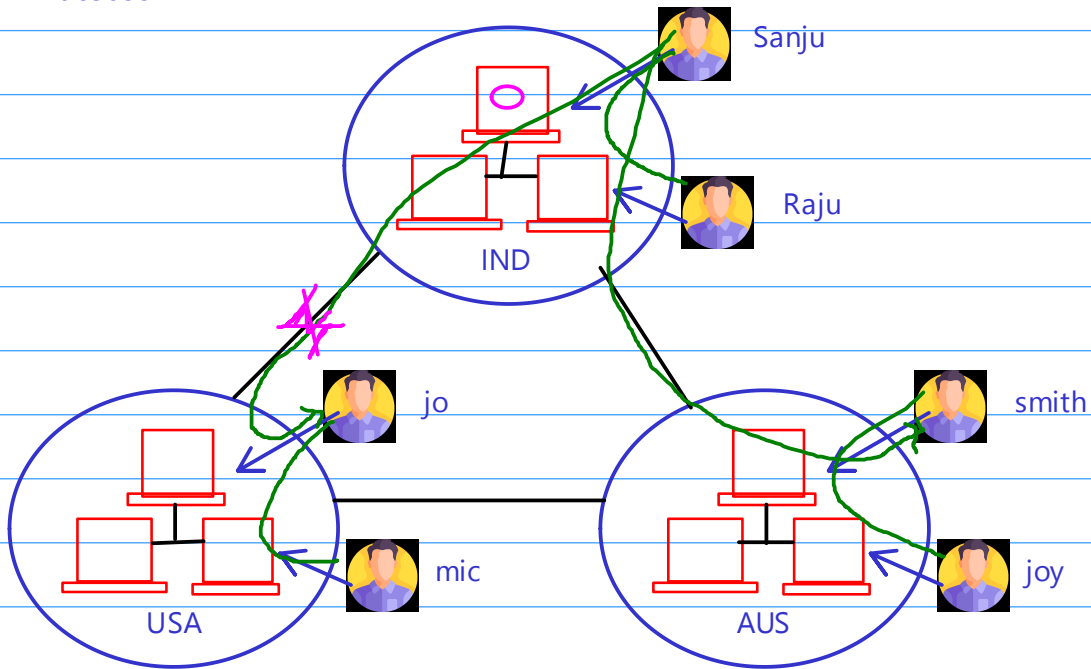to perform dedicated task / work

Distributed computing =>
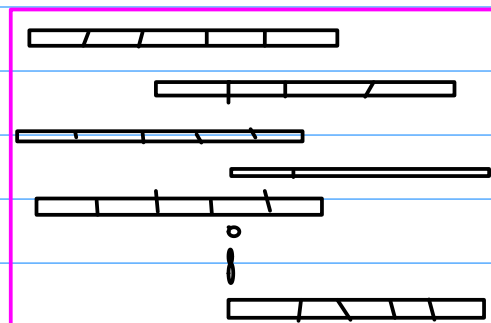
@1998
@2004   last.fm   #NoSQL

@2006 - 2007   ACID
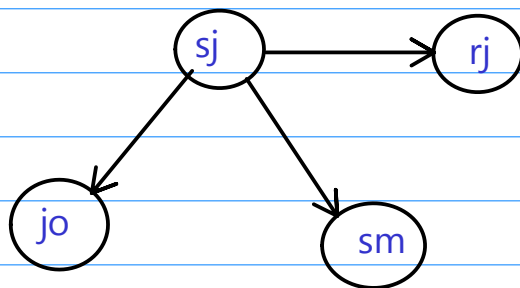
Partition Tolerance

facebook

Sanju

Raju

IND

jo

mic

USA

smith

joy

AUS

RDBMS = 50000 X 30

city => count =pune ?

rowID	name		mob		city		DOB
1	xyz	1	99877	1	pune	1	22-3-98
2	sanju	2	56756	2	pune	2	24-7-94
					.....		

4000   count =

sum, avg, min, max, count

sj → rj

sj → jo

sj → sm

```
name:"ravi"
age:24
mob:"987766"
bd group: "B+"
```

```
name:"raju"
age:43
mob:"9866566"
bd group: "O+"
```

field

RDBMS	Doc NoSQL
row	Document
column	field
table	collection

emp info

empID	name	salary	deptNo
1009	smith	25	10
2309	Joy	34	20

semi structure => XML   JSON

```
<emps>
    <emp>
        <empid>1009</empid>
        <name>smith</name>
        <salary>25</salary>
        <deptNo>25</deptNo>
    </emp>
    <emp>
        <empid>2309</empid>
        <name>joy</name>
        <salary>34</salary>
        <deptNo>20</deptNo>
    </emp>
</emps>
```