Chapter → 9

33. What are the challenges of cloud Computing

Ans:

The challenges of cloud computing are

a. Performance isolation
b. Reliability
c. Latency & bandwith fluctuations.
d. Data logging

34. Write cloud application opportunities

Ans:

For existing applications

a. Processing Pipelines
b. Batch Processing systems.
c. Web applications.

For new applications

a. Batch Processing for decision support systems & business analytics.
b. Mobile interactive applications, to Process large volume of data.
c. Science & engineering based Computing to Compute intensive & data intensive

35. What is Pipeline. Describe it shortly

Ans:

Pipeline:

Processing Pipelines are data-intensive & sometimes Compute-intensive. It is mainly helpful to represent a fairly large segment of application running currently inside a Cloud environment. The Properties are.

a. Indexing: Large dataset created by web crawler engine.

b. Data Mining: Searching large collection of records.

c. Image Processing: Compress or encrypt images.

d. Video Transcoding: Converting video formats.

e. Document Processing: Convert documents from one format to another. Encrypt document. Besides optical character recognition (OCR) can Produce digital image.

36. Draw figure for video Processing

Ans:

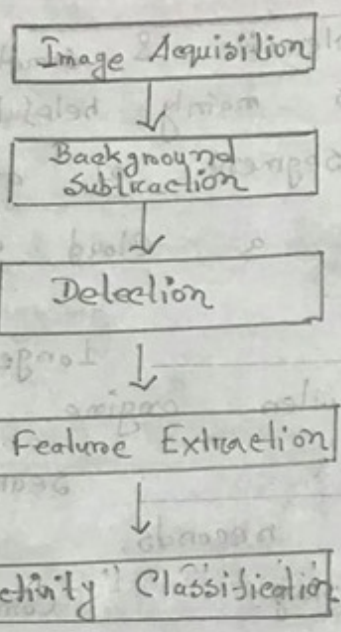


Figure: Video Processing Pipeline

37. What is Batch Processing Applications. Write some use

Ans: The execution of non-interactive Processing tasks.

a. Generation of daily, weekly, monthly, annual activity reports.

b. Processing, aggregation, summaries of daily transactions.

c. Processing billing & Payroll records.

38. What are the architectural styles for cloud application.

Ans:

The architectural styles of cloud application are

a. Client - Server Paradigm.
b. Stateless Server Paradigm
c. Remote Procedure Calls Paradigm
d. Simple Object Access Protocol (SOAP) Paradigm
e. Representational State Transfer [REST] Paradigm

- Client-Server এর ক্ষেত্রে client এর Server এর সাথে Connect হতে হয়,
- Stateless Server এর ক্ষেত্রে client এর Server এর সাথে Connection establish করতে হয় না,
- ~~Statele~~ Stateless Server Paradigm request & response Protocol ব্যবহার করে,
- Stateless Server [HTTP → TCP] ব্যবহার করে
- SOAP [XML Format] ব্যবহার করে, SOAP [TCP, UDP] Protocol ব্যবহার করে,
- REST নিজেই Protocol হিসেবে কাজ করে, তবে REST মূলত একটা Architectural style

39. Write differences between SOAP vs REST.

Ans:

SOAP	REST
a. SOAP is Protocol.	a. REST is an architectural style
b. SOAP can not use REST.	b. REST can use SOAP
c. SOAP ~~uses~~ uses services interface to expose the business logic.	c. REST uses URI to expose business logic
d. Requires more bandwith.	d. Requires less bandwith.
e. Only supports XML format	e. Supports mutiple message formats.

Work Flow:

A Process description is called a workflow.

Q. Draw diagram of life cycle of work-flow & Computer Program

Ans:

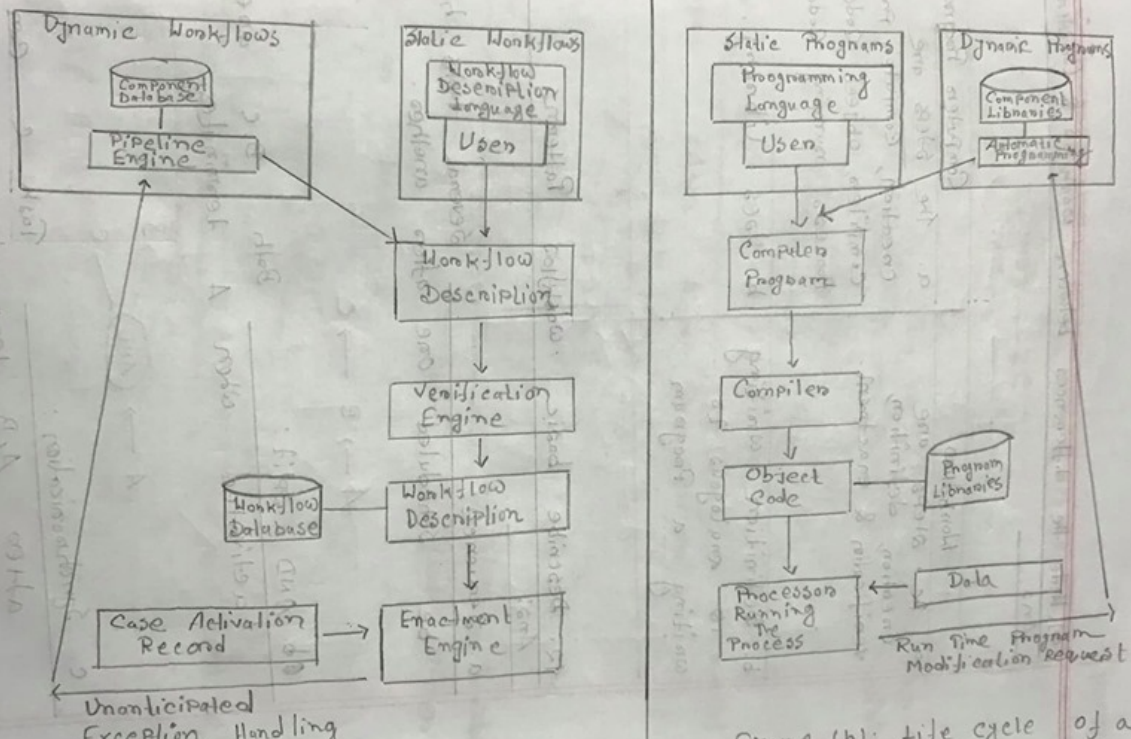


Figure (a): life cycle of a workflow

Figure (b): life cycle of a Computer Program

41. Write the differences between workflow & Computer Program

Ans:

Workflow	Computers Program
a. The steps are creation, definition, verification & enactment.	a. The steps are creation, Computer Program, Compiler, object code, Process running code.
b. Definition writing is analogous to writing a Program.	b. Uses library.

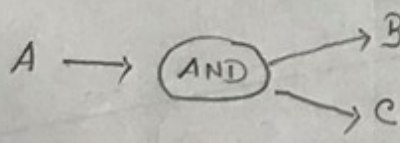
42. Describe basic workflow Patterns.

Ans:

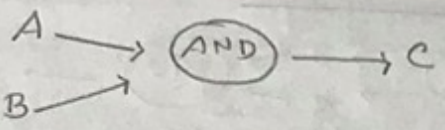
a. Sequence: Several tasks have to be scheduled one after another.

A → B → C

b. AND Split: Both B, C are activated when A terminates

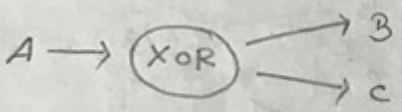


c. Synchronization: Task C can start after A, B terminate



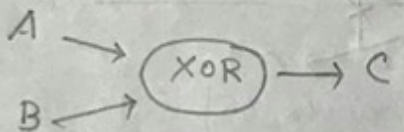
d. XOR Split:

After Completion of task A; either B or C can be activated



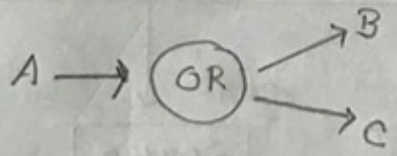
e. XOR Merge:

Task C is enabled when either A or B terminate



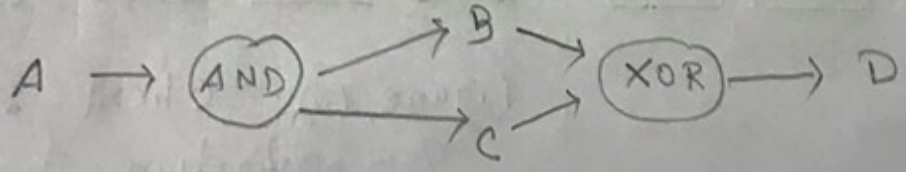
f. OR Split:

After Completion of task A one could activate either B, C or both.

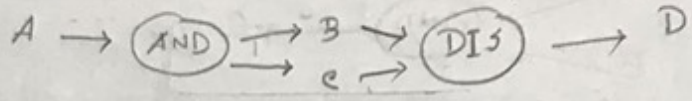


g. Multiple Merge:

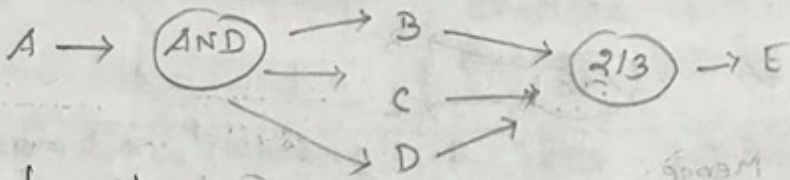
Multiple AND, OR, XOR can merge.



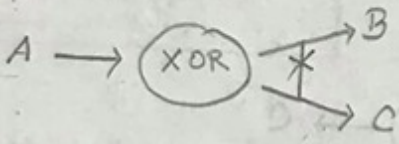
h. Discrimination:



g. N Out M Join:



h. Deferred ~~Choci~~ choice:



43. What is Co-ordination model diagram. Draw Co-ordination model. (Zookeeper)

Ans:-

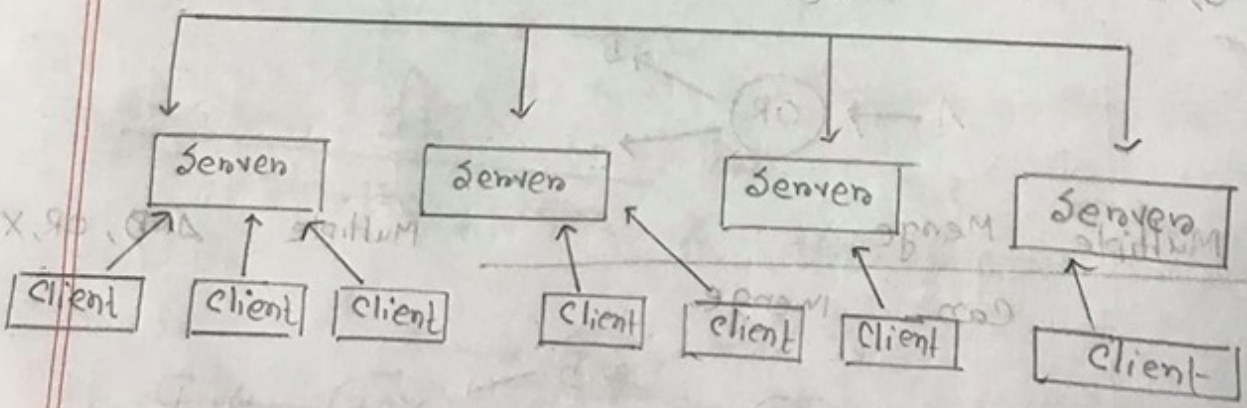
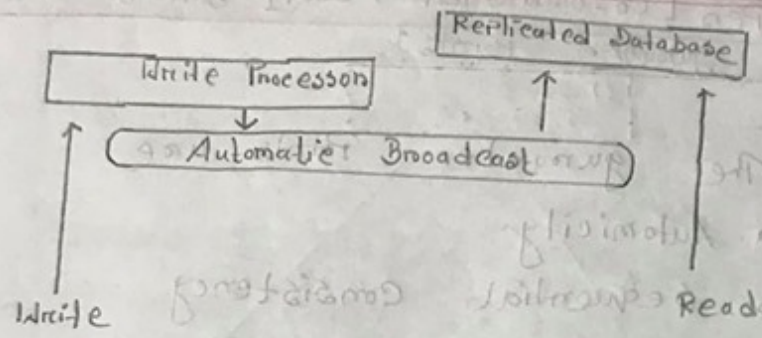
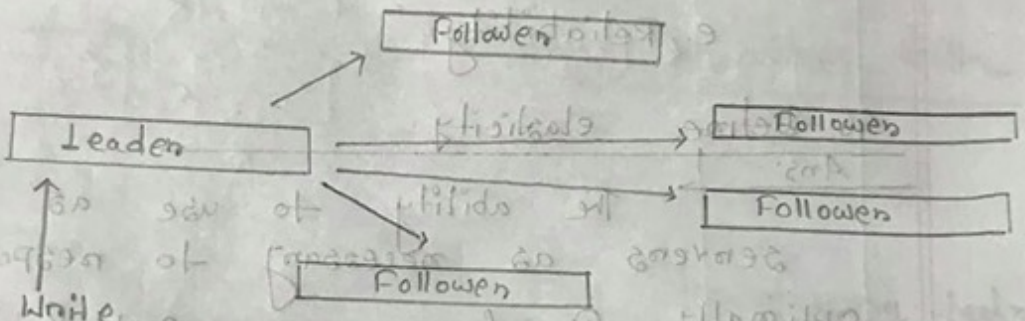


Figure (a): client - server Co-ordination



Figune (b): Functional Model Co-ordination Write & Read



Figune (c): Functional Model Co-ordination Write only

44. What is Zoo-keeper Co-ordination

Ans:

It's a distributed Co-ordination Service for large scale distributed systems.

45. ZooKeeper [Co-ordination Model], follows which Service guarantee Points?.

Ans:

The guarantee Points are

a. Automicity
b. Sequential consistency
c. Single system image for clients
d. Persistence of update.
e. Reliability.

46. Define elasticity.

Ans:

→ The ability to use as many servers as necessary to respond optimally. It focuses on cost & timing constraints of an application.

47. Describe how to divide load.

Ans:

Load can be divided into two type

a. Transaction Processing systems:

A front-end distributes the incoming transaction to a number of back-end systems. As the workload increases new back-end systems are added to the pool.

b. Data Intensive Batch Application:

It follows two ways.

i. Modularly Divisible: The workload Partitioning is defined a Priori.

ii. Arbitrarily Divisible: The workload can be Partitioned into an arbitrarily large number of smaller workloads.

48. What is Map Reduce Philosophy. Describe with Proper figure.

Ans:

Map Reduce: It's a Processing technique & a Program model for distributed computing.

Map takes a set of data. It converts the data into another set of data. Where individual elements are broken down into tuples.

Reduce takes the output from a map as an input. Combines those input map (tuples) into a smaller set of tuples.

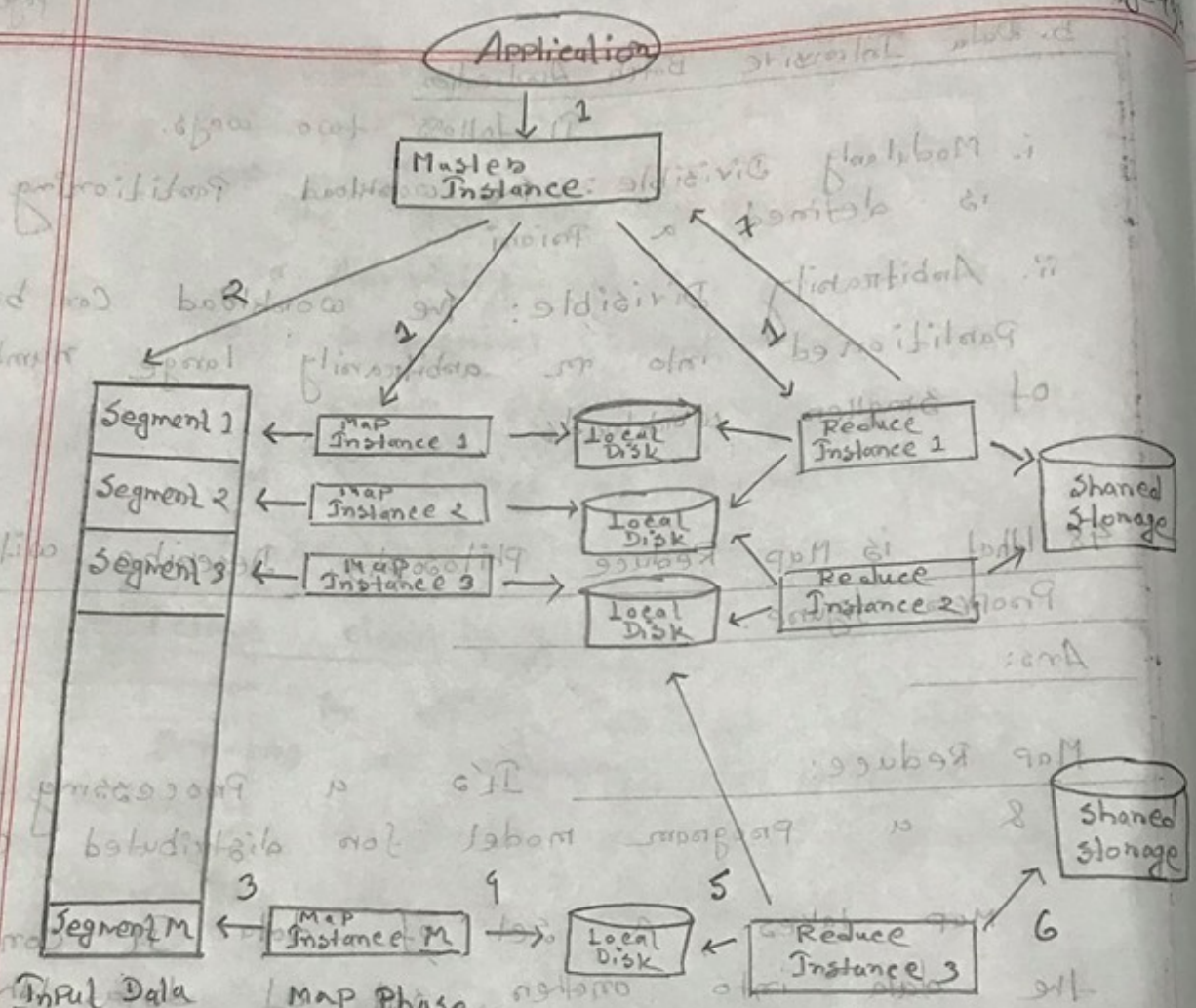


Figure: MapReduce Technique

1. An application starts a master instance.
   M → Number of worker instances for Map Phase.
   R → Number of worker instances for Reduce Phase.

2. The Master instance Partitions the input data in M segments.

3. Each map instance reads its input data segment & Processes the data.

4. The results stored on local ~~disks~~ disks.

5. After finishing Processing of data. R reduce instances read the results of the first Phase & merge the Partial results.

6. The final results are written by the reduce instances to a shared storage server.

7. The master instance monitors the reduce instances & when all of them report task completion ; the application is terminated.