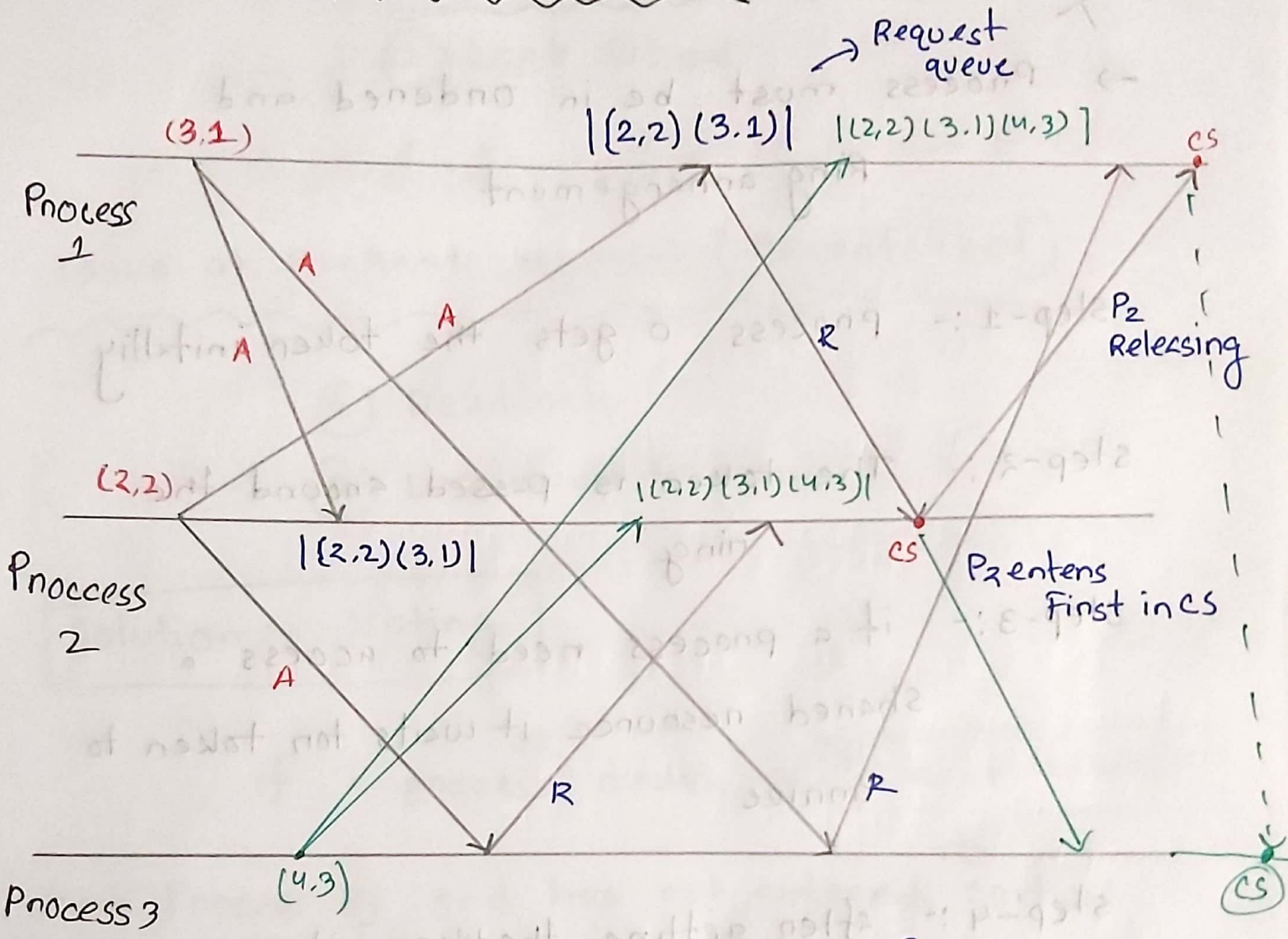
18 Final

Lamport total ordering



R = Reply message

A = Request message

Sequence entering :-

P2, P1, P3

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Token Ring Algonithm

→ Process must be in ondened and Ring annangement

step-1 :- process 0 gets the token initially

step-2 :- The token is passed anound the ring

step-3 :- if a process need to access a shaned nesounce it waits ton token to annive

step-4 :- aften getting the token it execute enitical section and nelease nesounec

step-5 :- pass the token to next process if next process donot want to enten CS, it also pass the token

Issue of Token Ring :-

1. Lost Token

Issue of Richant Agrawal (Decentralized)

1. Deadlock
2. Less fault tolerance

Solution :- Voting

if a process P_i recive a "Retract message" from Process P_j and has not entened its critical section, it sends P_j a Relinquish message and that vote no longen counts.

Q: Memory coherence ~~Protocols~~:-

mechanism that controls / synchronizes accesses is needed to maintain memory coherence

1. sequential consistency
2. General consistency
3. processon consistency
4. weak consistency
5. Release consistency

(& final)

Q memory coherence Protocol

1. write - Invalidate protocol
2. write - update protocol

what is thrashing ?

Final

→ Thrashing refers to situation which occurs when there is Mismatch between the rate of data production and the capacity of the system to handle or process that data.

what is Indirect Communication ?

Final

communication between entities in distributed system through an immediary and no direct coupling between sender and reciver

key properties

1. Space uncoupling
2. Time uncoupling

Space uncoupling

18 Final

refers to key properties indirect communication where sender donot need to know and identify recivers, senders/receiver can be replaced, updated, Replicated on signated

Time uncoupling

Senders and receiver donot have to exists at the same time

Time coupled and space coupled

communication directed towards a given receiver where receiver must exist at that ~~time~~ moment in time

Message passing, Remote Invocation

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Space uncoupled and Time uncoupled (18 Final)

→ Senden doesn't need to know the indentity of receiver

→ Senden and neciven can have independent lifetime.

Communication panadigm :- Indinect communication

1. pub-sub system
2. message queue
3. Distributed shaned memony
4. Gnoup communication

(18 Final)

Multicast Communication :- comunication based on anender and a gnoup of neceiven

Ex :- Gnoup communication

Q Briefly explain pub-sub system. Give a propen diagam and example [16 Final]

—°

pub → publishen :- publish structural event

sub → subscriben :- expness intenest in panticulan published event (subscription)

pub-sub system :- matches subscription against published events by delivery event notification

Applications that can use pub-sub system

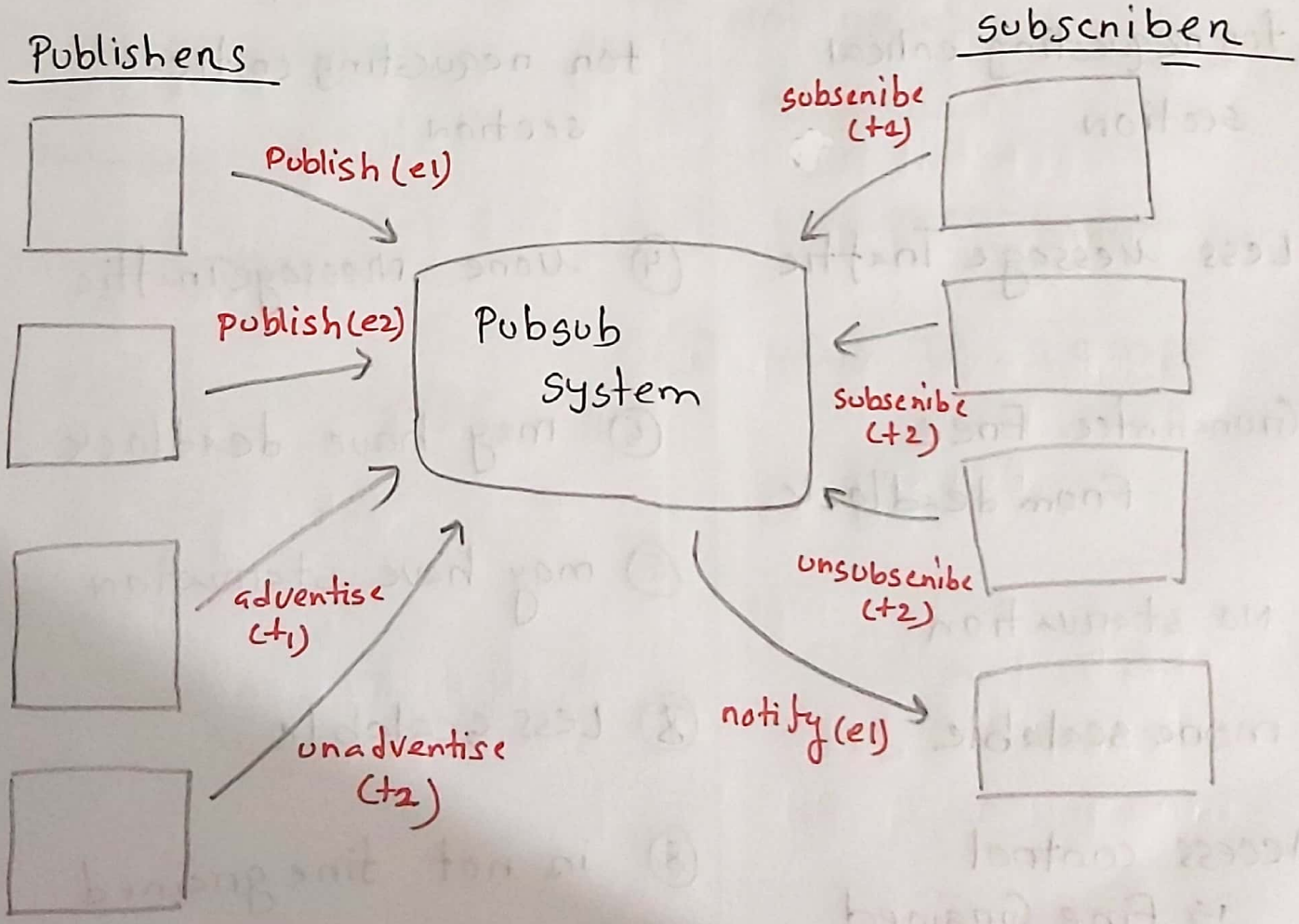
[18 Final]

1. Finicial system
2. Live Feeds including RSS on RDF
3. Ubiquitous computing suppont
4. Monitoning Application

pub-subsystem operations

→ hetenogenous + Asynchnonous

1. publish → publish an event by publishen
2. subscribe → subscribe to a particular pattern
3. notify → event annives at subscriben
4. unsubscribe → to nevoke subscription
5. adventise → declare nature of future event
6. unadventise → nevoke an adventisement



Final 16

Token based solution	Permission based solution
(1) A unique token is shared among all process	(1) There is no concept of token
(2) To enter critical section, process must have token	(2) To enter critical section need permission of other processes
(3) Use sequence order for requesting critical section	(3) Use Timestamp order for requesting critical section
(4) Less message Traffic	(4) More MessageTraffic
(5) Guarantee Free From deadlock	(5) may have deadlock
(6) No starvation	(6) may have starvation
(7) more scalable	(7) Less scalable
(8) Access control is Fine Grained	(8) in not fine grained

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connection Oriented	(Final) Connectionless
(1) Designed for Telephone system	(1) Designed for postal system
(2) need end to end connection between sender and reciver before transmission	(2) transfer data packets between sender to reciver without creating any connection
(3) needs authentication	(3) No needs authentication
(4) Higher Bandwidth	(4) Less Bandwidth
(5) more Reliable	(5) Not reliable
(6) No congestion	(6) congestion
(7) Higher overhead	(7) Less overhead
(8) TCP :- Example	(8) UDP, IP, ICMP

TCP Transmission control Protocol	UDP, user datagram protocol
① requires established connection before transmitting data	① no connection is needed for data transfer
② sequence data and send in a specific order	② cannot arrange / sequence data
③ Retransmit data if packets fail to arrive	③ No data net trans-mitting Lost data cannot retrived
④ Gunnantee delivery	④ donot Gurantee delivery
⑤ check for errors in data arrival	⑤ donot check all errors

⑥ do not support bnoadcasting	⑥ support bnoad casting
⑦ speed slow but complete deliveny data	⑦ Fast but risk of incomplete data deliveny
⑧ best For → Email on texting → File tnansfen → web bnowsing → tnansfening files (family photo) ensone data anives exactly it was sent → pne neconded Streaming NETFLIX HBO	⑧ → Live streaming → Online gaming → vedio chat / confenence → speed data tnansfen (lag Fnee gaming) → multicasting → VoIP (in app voice calling) → Domain system Name IP addnessing → less packet loss → lange Range than TCP

18 Final

what is Map Reduce ?

→ perform processing the large data in a DS and parallel managen

The term map reduce actually refers to the following different tasks that Hadoop program do

(1) The Map Task :- This is the first task which takes input data and converts it into a set of data which individual elements are broken down into tuple key / value pairs

(2) The Reduce Task :- This task takes output from a map task as input and combines those data tuples into a smaller set of tuples. The Reduce task is always Performed after map task

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How does MapReduce works?

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(1) Input partitioning

(2) Map phase

→ assigned to different map

→ Map (key, value)

↓ ↓

word occurence

(3) shuffling and sorting

→ group same key value pair

(4) Reduce phase

→ Reduce function recives all pairs with the same key

→ Reduce (key, list(value)

→ list (output)

(5) JobTrackers Accepts mapreduce jobs and Tasktracker runs and reduce tasks

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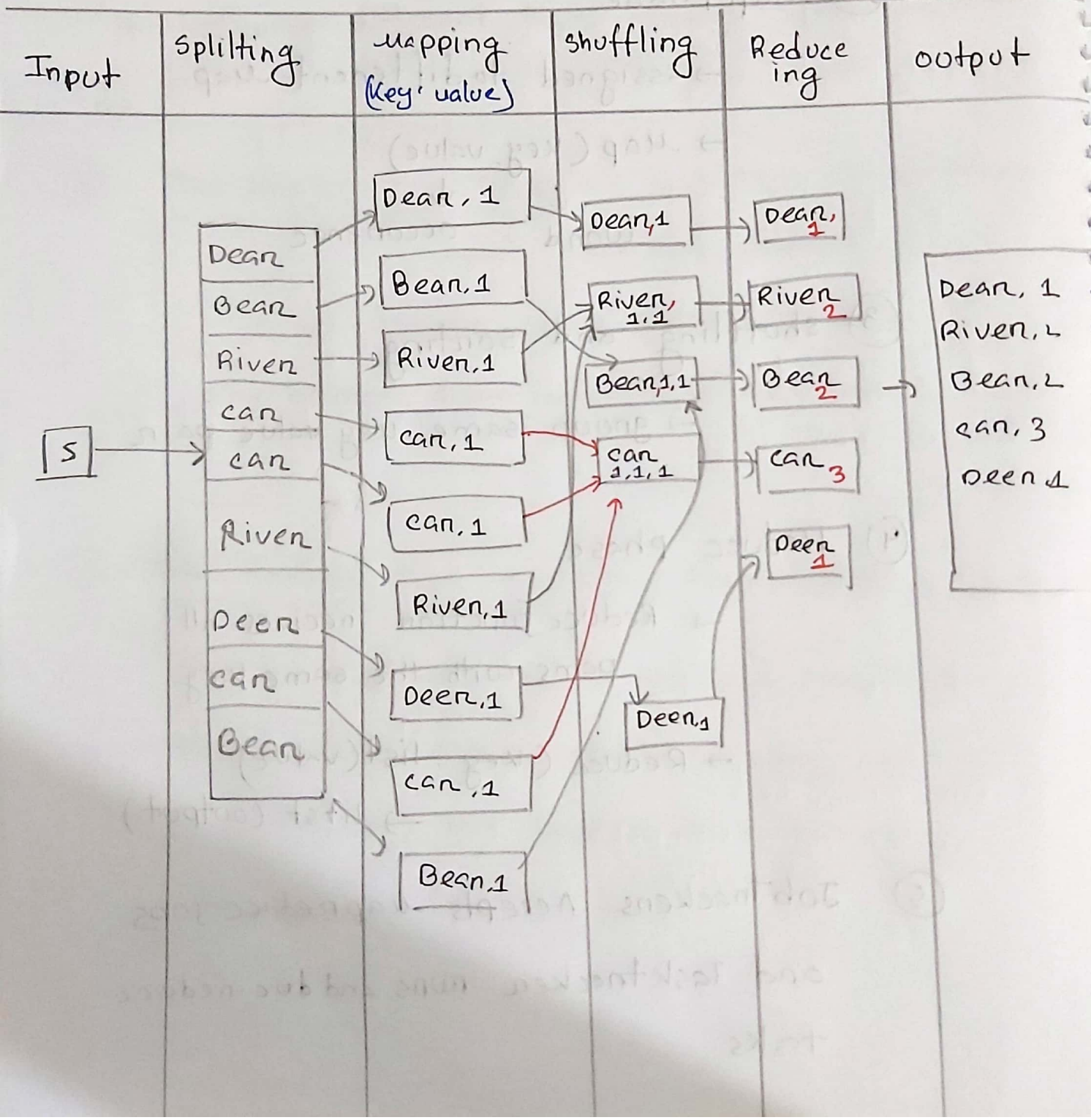
→ count the occurence using MapReduce

Q Following words

S = "Dear, Bear River, car, car, River, Deer car, Bear"



18/16
Final

What does Hadoop do?

Hadoop is an ensential framework that allows distributed processing of large datasets across clusters of computers using a simple programming model.

includes

① Mapreduce : divides application into many small blocks of work

② HDFS :- (Hadoop distributed File system)

creates multiples replica of data blocks for reliability, placing them on compute nodes around cluster