
JEOPARDY!
The 2nd Database Tour

Rules

Reset

- Reverse Jeopardy: The answers are the answers
- You have to answer as a group
- Correct answers give candy points, wrong answers subtract candy points. And yes, you might own me candy at the end ;)
- Every question has a certain number of seconds (indicated at the lower bar). After X seconds a bell indicates that the time is over
- Groups willing to answer the question have to raise their hand
- Among groups with hands raised the moderator picks a group.
- At the discretion of the moderator, the answer is deemed correct or wrong. If correct, the group can choose the next question. If wrong, candy is subtracted and another group can answer
- Some questions are “all hands”, indicated by the all hands symbol. All hands solutions have to be done on the white/black board and all groups with correct answers get candy points.
- If every member of your group at least answere[illegible] your group gets a Jelly Bean bonus

Distributed DBMS	Recovery	Concurrency Control	Analytic Frameworks/ Streaming
2 Candy	2 Candy		2 Candy
	3 Candy		3 Candy
	4 Candy	4 Candy	4 Candy
5 Candy	5 Candy	5 Candy	5 Candy

Distributed Database Systems

Back

1 Candy

Under what type of workload would H-Store's transaction processing technique not work?

3 Candy

Back

If a system ensures Atomicity, Durability, and Isolation, is it by definition not also Consistent? Explain by means of an example why/why not?

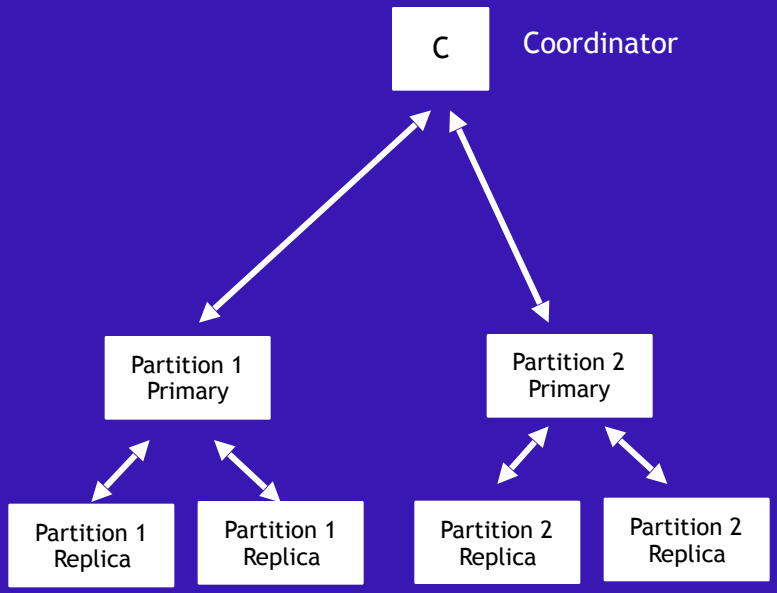
4 Candy

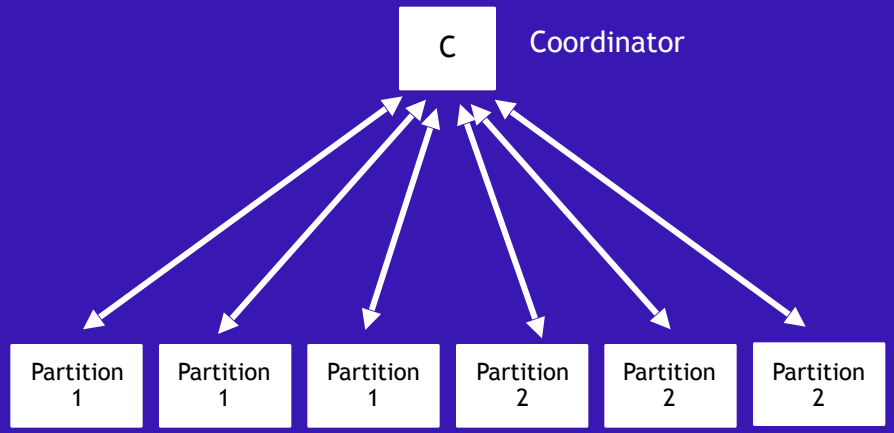
Back

So far you used a Primary/Backup replication scheme for your distributed transactional database with 2-phase locking. However, it is slow as the replication adds additional latency.

Somebody in your team had the genius idea two use 2-phase commit to directly update the primary and replicas, making it essentially an Active-Active replication scheme. Moreover, s/he argues that you can simply use the majority of responses, which will increase availability.

Name at least one problem in his argumentation.





Recovery

Back

1 Candy

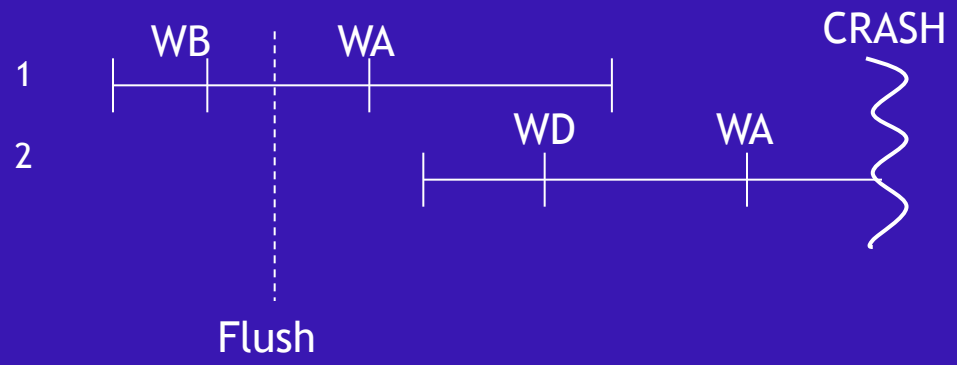
Consider the idea of write-ahead logging.

Suppose an application did not follow this policy, and wrote data to the database before writing to the log. What could go wrong?

Back

2 Candy

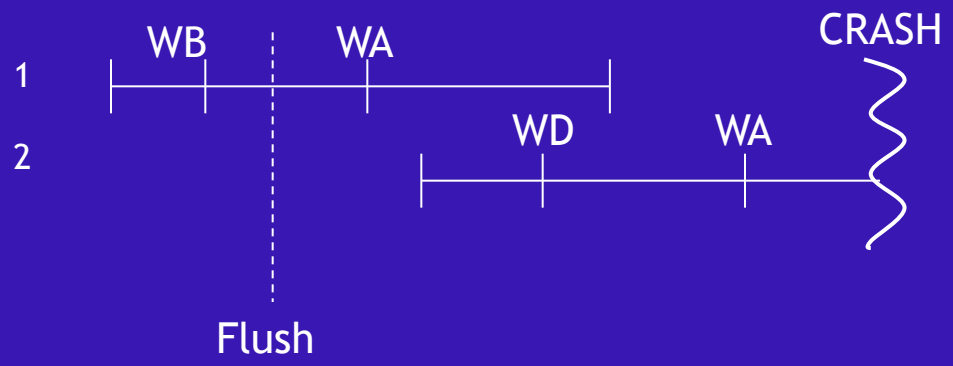
Your system uses ARIES. How does the Dirty Page Table Look like after the crash assuming you the start of the transaction is LSN=1



DirtyPgTable

LSN	Type	TID	PrevLSN	Data
1	SOT	1		
2	UP	1	1	B
3	UP	1	2	A
4	SOT	2		
5	UP	2	4	D
6	EOT	1	3	
7	UP	2	5	A

Page	pageLSN
A	3
D	5



Back

Back

5 Candy

Which configuration has better transaction processing performance?

Which configuration has a faster recovery time? Why?

System 1: No-Force/Steal

System 2: Force/No-Steal

Concurrency

Back

1 Candy

Under strict two-phase locking will t1 (t2) commit or abort

assuming there are no other concurrent transactions?

Time	Transaction	Operation
12	T1	Start
13	T1	Read A
16	T2	Start
17	T2	Read C
18	T2	Write C
19	T2	Commit/Abort????
20	T1	Read C
21	T1	Write C
22	T1	Commit/Abort????

Back

2 Candy

Under snapshot isolation will t1 (t2) commit or abort assuming there are no other concurrent transactions?

Time	Transaction	Operation
12	T1	Start
13	T1	Read A
16	T2	Start
17	T2	Read C
18	T2	Write C
19	T2	Commit/Abort????
20	T1	Read C
21	T1	Write C
22	T1	Commit/Abort????

Back

3 Candy

Under OCC will t1 (t2) commit or abort
assuming there are no other concurrent transactions?

Time	Transaction	Operation
12	T1	Start
13	T1	Read A
16	T2	Start
17	T2	Read C
18	T2	Write C
19	T2	Commit/Abort????
20	T1	Read C
21	T1	Write C
22	T1	Commit/Abort????

Analytic Frameworks / Streaming

Back

1 Candy

Time in s	Event	Temperature
0	e1	68
1	e2	69
2	e3	70
5	e4	69
7	e5	70
10	E6	71

What events would be included in a

1)Count-based sliding window of size 2

2)Time-based sliding window of 4s

3)Time-based Tumbling window of 4s

4)Count-based Landmark window