SESSION CONSISTENCY

Session Consistency

Contacts:
Joe: ~~555-1234~~
Joe: 555-5678

Write

Read

Contacts:
Joe: 555-1234

Session Consistency

- Read your writes
- Monotonic reads
- Writes follow reads
- Monotonic writes

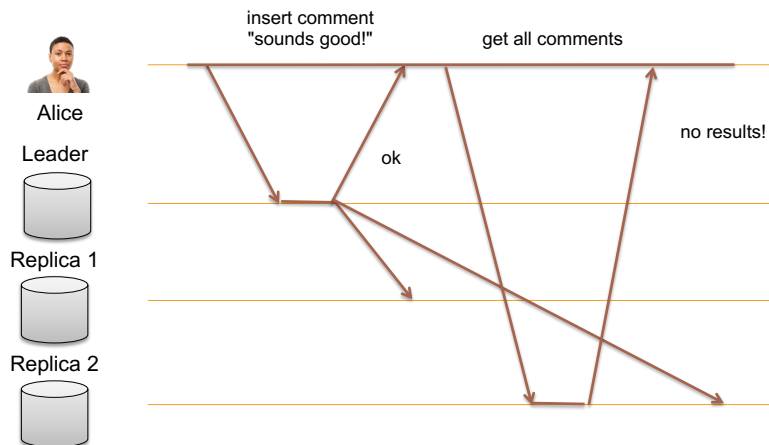Pick one! (per session)

- Assume global eventual consistency property

Session Consistency

- Read Your Writes

Session Consistency

- **Read your writes (RYW)**
- Monotonic reads
- Writes follow reads
- Monotonic writes

Contacts:
Joe: ~~555-1234~~
Joe: 555-5678

Contacts:
Joe: ~~555-1234~~
Joe: 555-5678

Write

Read

Example Implementation:
Direct writer reads to leader
after doing a write

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Session Consistency

- Monotonic Reads
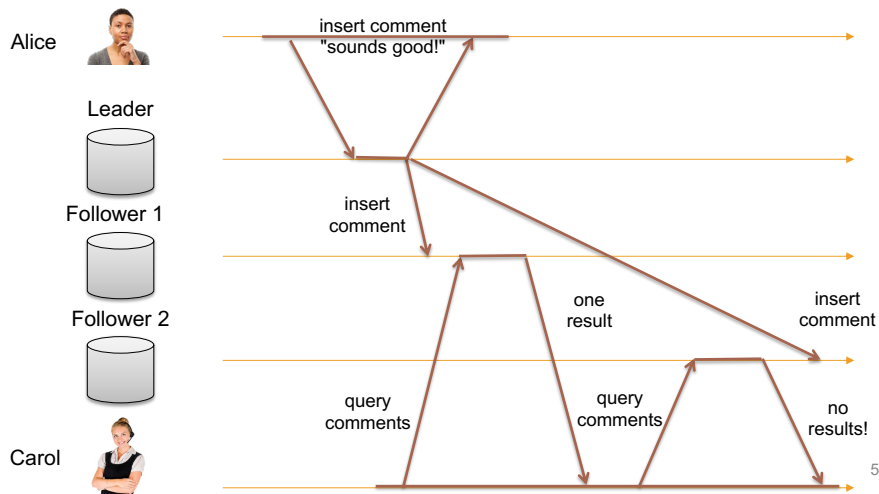
Alice

Leader

Follower 1

Follower 2

Carol

insert comment
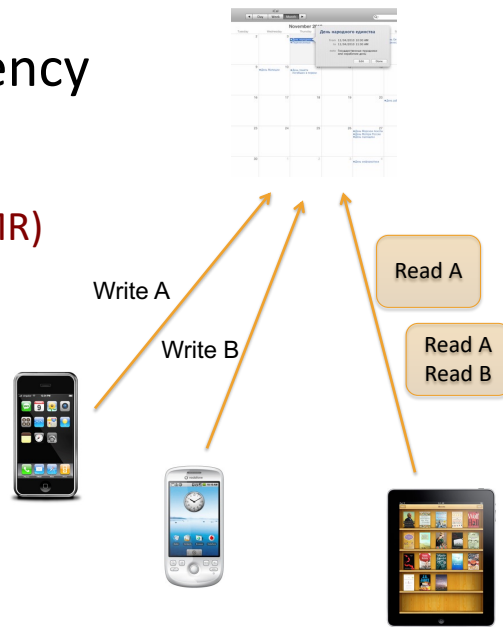"sounds good!"

insert
comment

one
result

insert
comment

query
comments

query
comments

no
results!

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Session Consistency

- Read your writes
- Monotonic reads (MR)
- Writes follow reads
- Monotonic writes

Write A
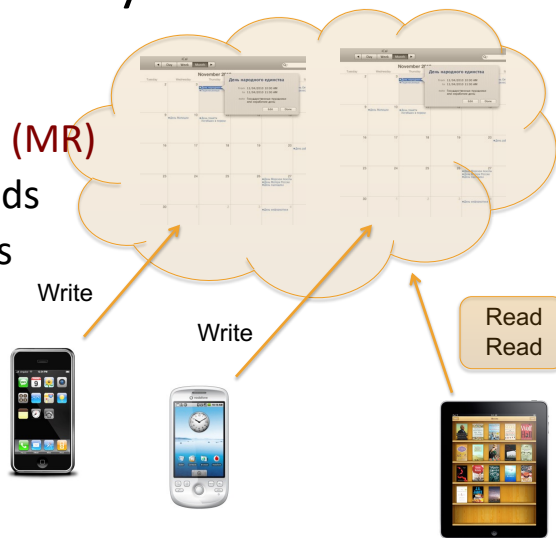
Write B

Read A

Read A
Read B

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Session Consistency

- Read your writes
- Monotonic reads (MR)
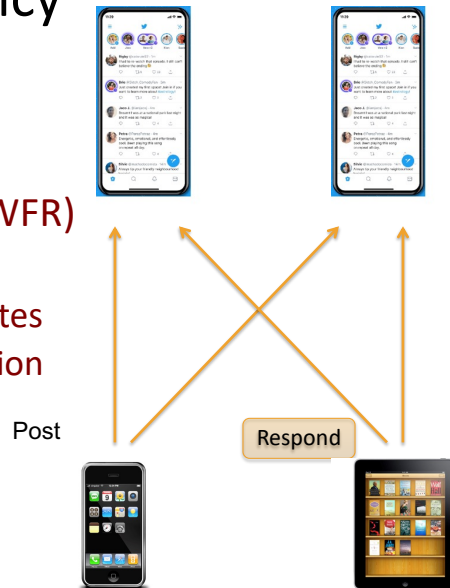- Writes follow reads
- Monotonic writes

Write

Write

Read
Read

Example Implementation:
Direct all queries in a
session to the same replica
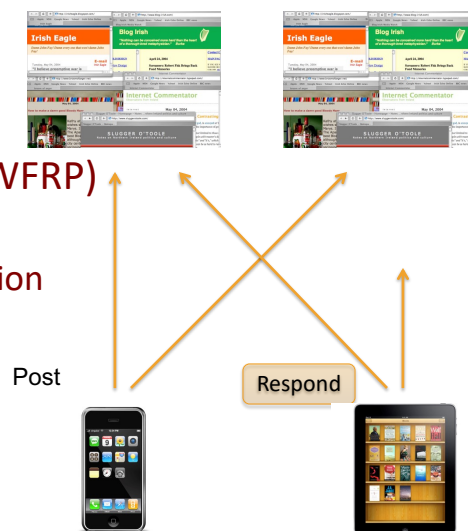
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Session Consistency

- Read your writes
- Monotonic reads
- **Writes follow reads (WFR)**
  - aka Session Causality
  - Global ordering of writes
  - Global write propagation
- Monotonic writes

Post   Respond

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Session Consistency

- Read your writes
- Monotonic reads
- **Writes follow reads (WFRP)**

  - Global write propagation
- Monotonic writes

Post   Respond

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Session Consistency

- Read your writes
- Monotonic reads
- Writes follow reads (WFRO)
  - Global ordering of writes

- Monotonic writes

Post

Update

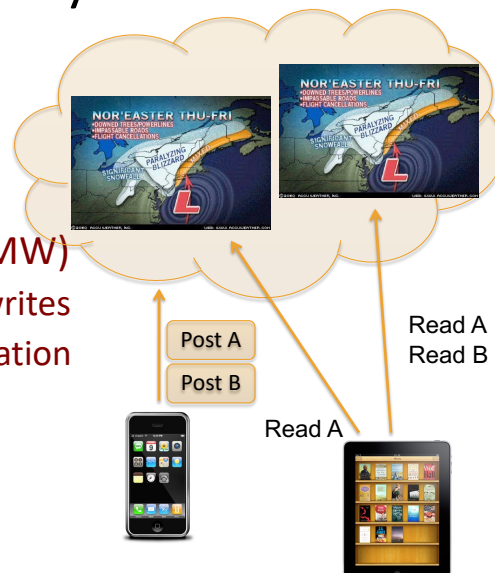57

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Session Consistency

- Read your writes
- Monotonic reads
- Writes follow reads
- Monotonic writes (MW)
  - Global ordering of writes
  - Global write propagation

Post A

Post B

Read A

Read A
Read B

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Session Consistency

- Read your writes
- Monotonic reads
- Writes follow reads
- Monotonic writes (MW)
  - MW = RYW + WFR?

Post   Update   Read
              Read

Session Consistency

- Read your writes
- Monotonic reads
- Writes follow reads
- Monotonic writes (MW)
  - MW ≠ RYW + WFR

Post   Edit   Update   Read
                          Read

Baseball and Consistency

Scorekeeper

Sports Writer

Umpire

Statistician

Radio Reporter

Stat Watcher

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Baseball & Consistency (1/2)

- Scorekeeper read reqt:
  - Strongly consistent?
  - Read my writes (only writer)
- Umpire:
  - Strongly consistent
- Radio reporter:
  - Eventually consistent?
  - Consistent prefix reads
  - Also, monotonic reads

Actual		Reported	
Home	**Other**	**Home**	**Other**
1	0	0	1
1	1		
2	1		

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Baseball & Consistency (2/2)

- Sports Writer
  - Strongly consistent?
  - Eventually consistent (Bounded staleness)
- Statistician:
  - Score: Strongly consistent (or Bounded staleness)
  - Stats: Strongly consistent?
  - Stats: Read my writes
- Stat Watcher:
  - Eventually consistent

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