MYE017 Distributed Systems

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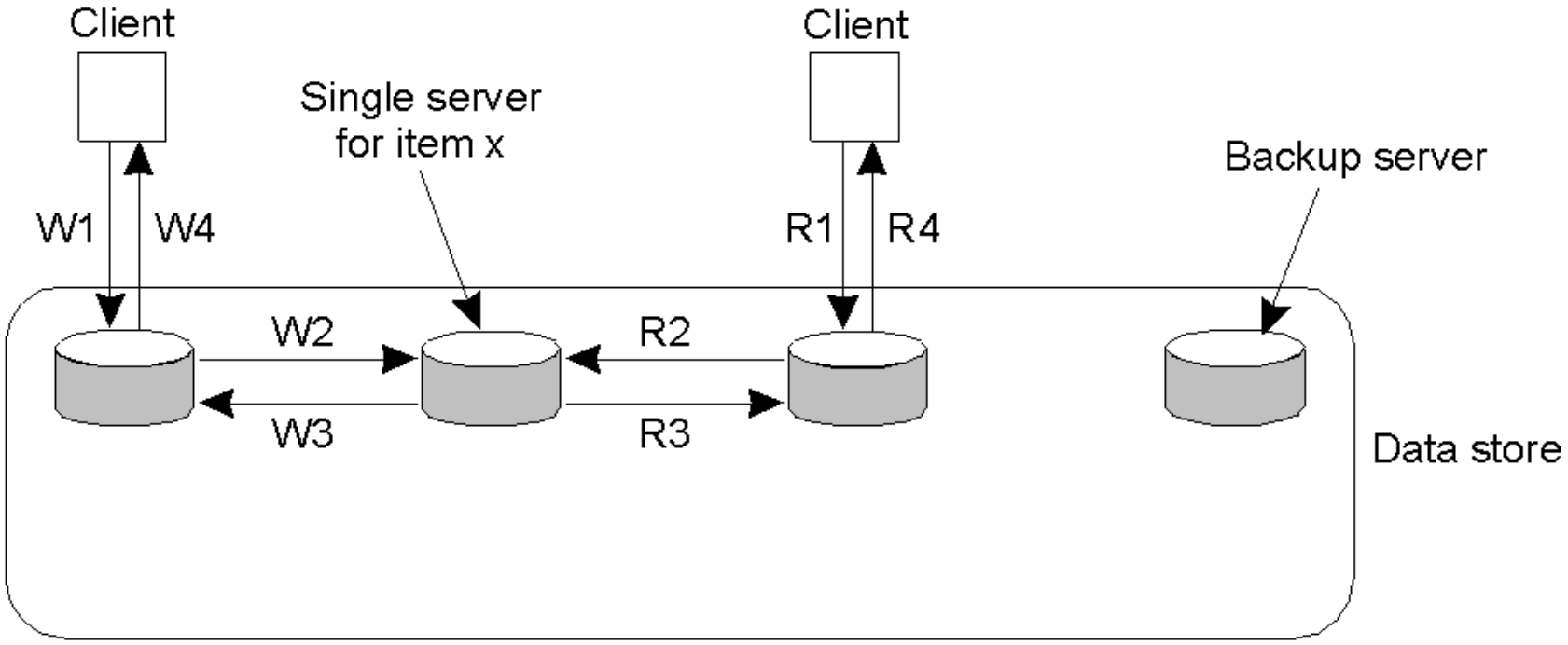
Remote-Write Protocols (1)

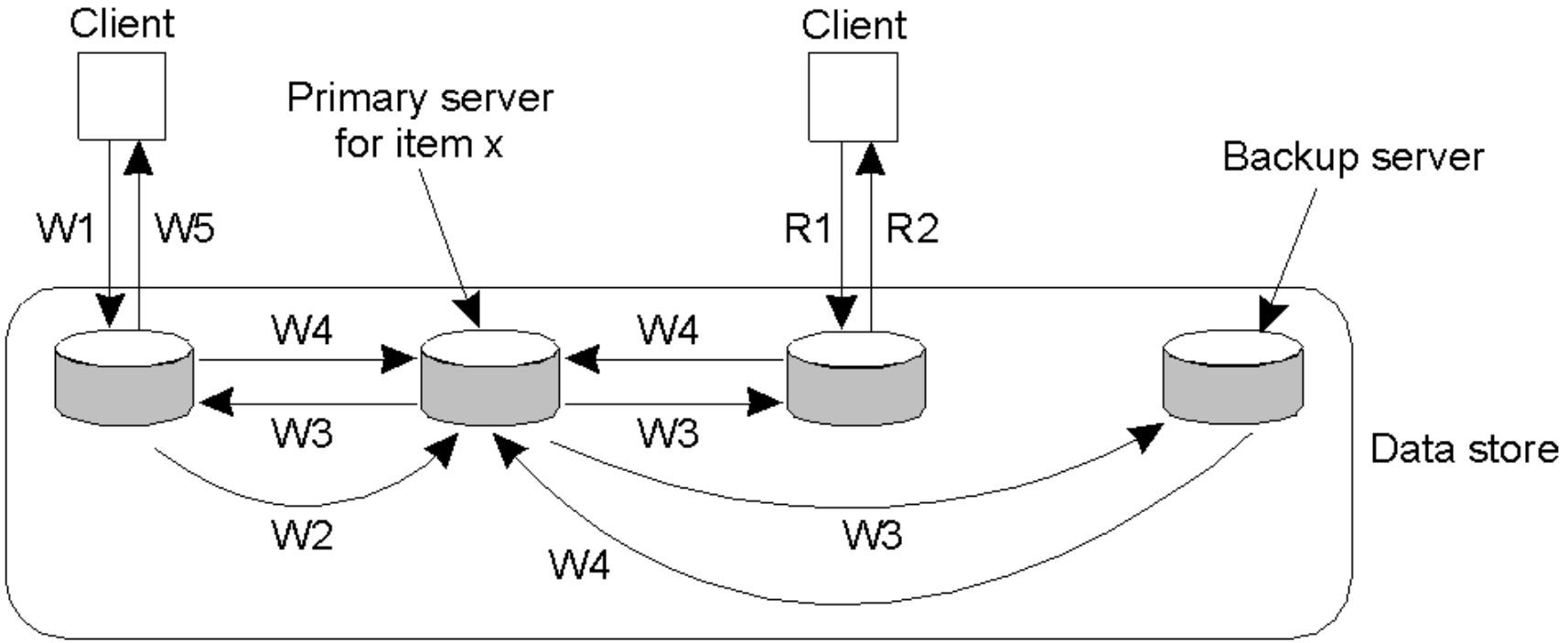


W1. Write request
W2. Forward request to server for x
W3. Acknowledge write completed
W4. Acknowledge write completed

R1. Read request
R2. Forward request to server for x
R3. Return response
R4. Return response

Primary-based remote-write protocol with a fixed server to which all read and write operations are forwarded

Remote-Write Protocols (2)

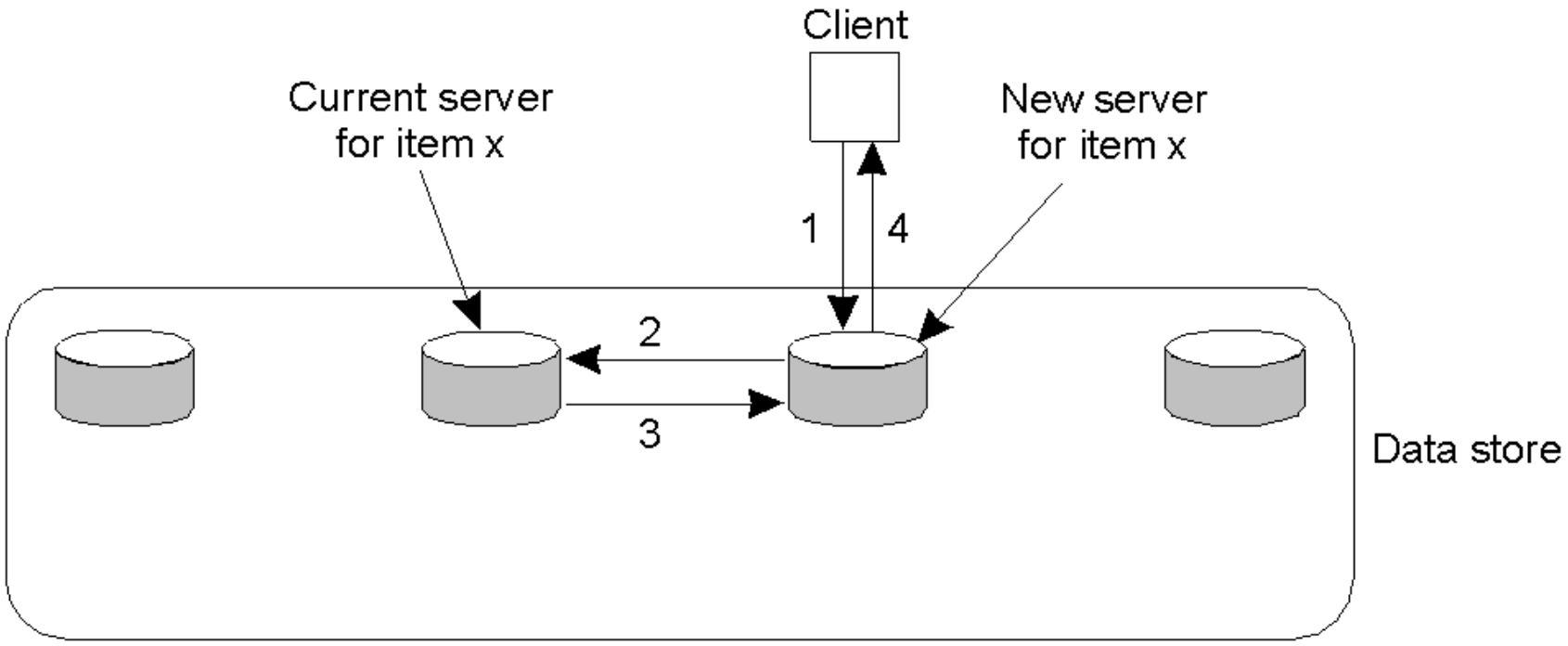


W1. Write request
W2. Forward request to primary
W3. Tell backups to update
W4. Acknowledge update
W5. Acknowledge write completed

R1. Read request
R2. Response to read

The principle of a primary-backup protocol

Local-Write Protocols (1)

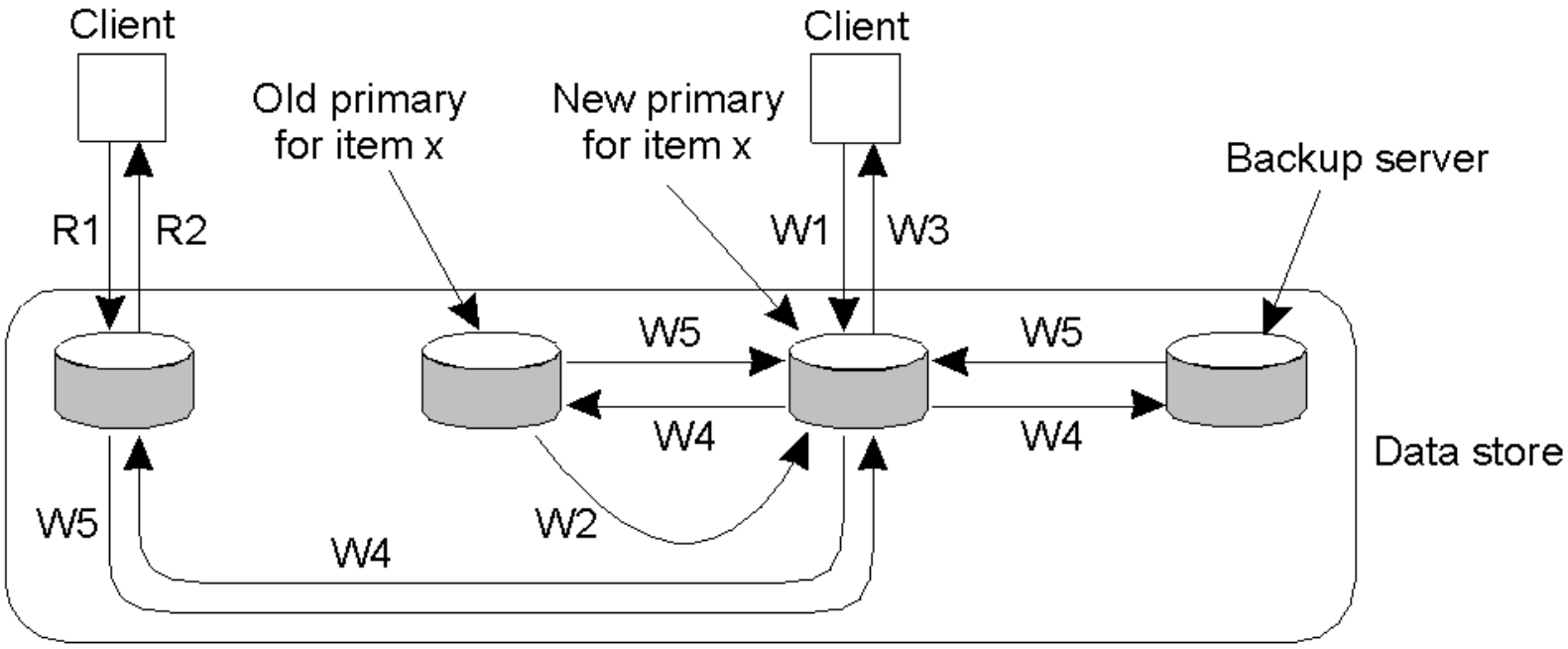


1. Read or write request
2. Forward request to current server for x
3. Move item x to client's server
4. Return result of operation on client's server

Primary-based local-write protocol

A single copy is migrated between processes

Local-Write Protocols (2)

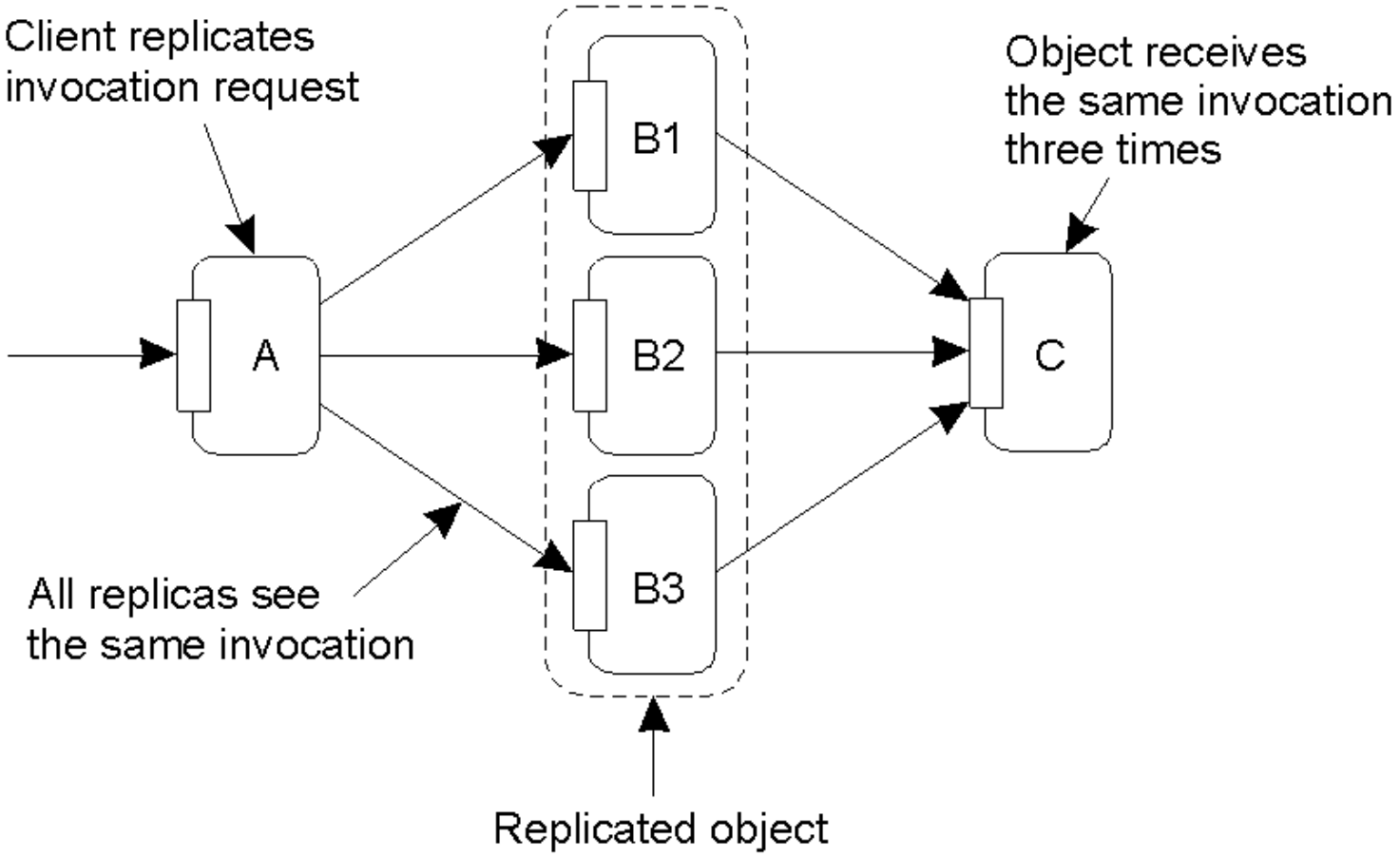


W1. Write request
W2. Move item x to new primary
W3. Acknowledge write completed
W4. Tell backups to update
W5. Acknowledge update

R1. Read request
R2. Response to read

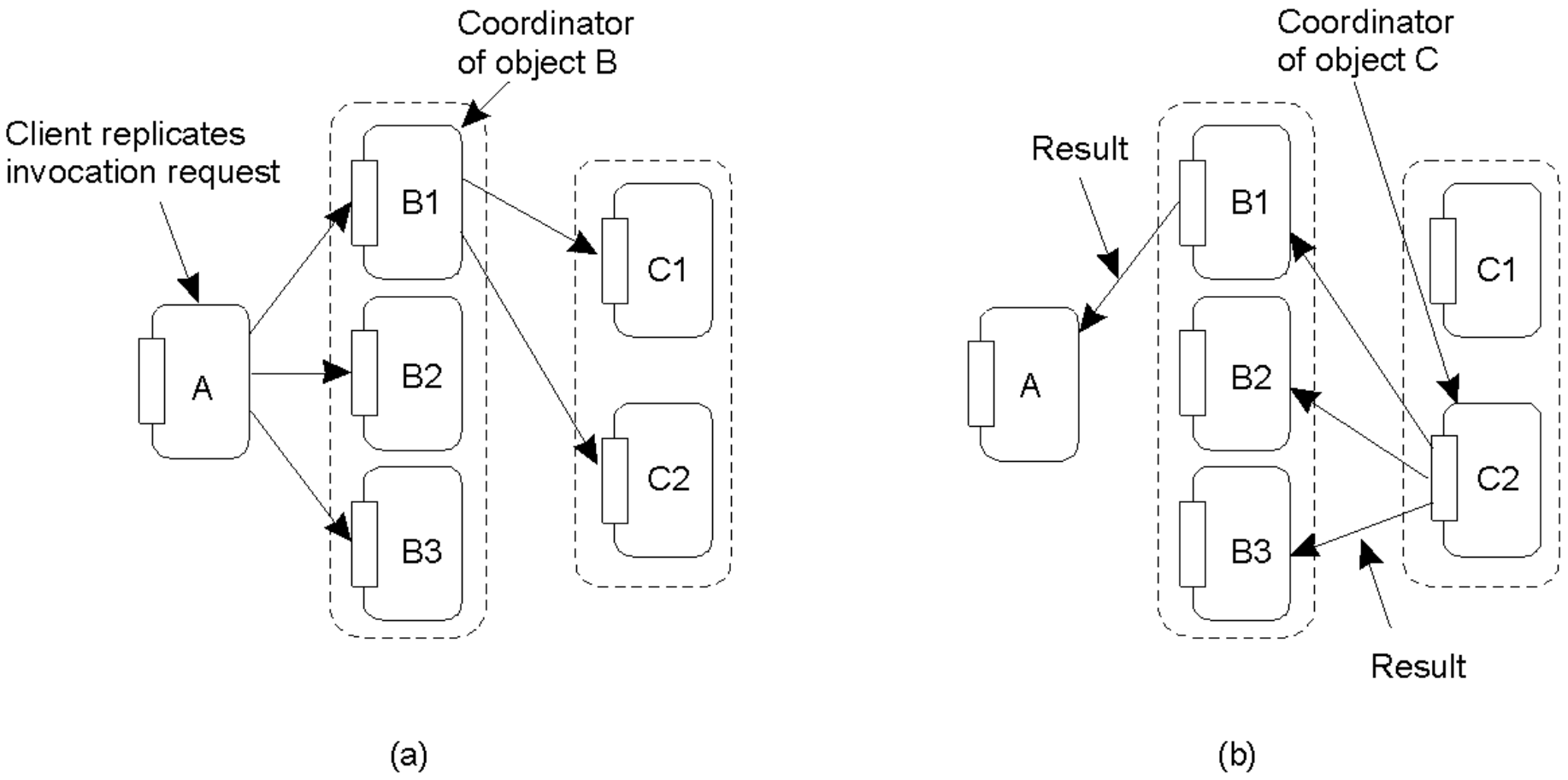
Primary-backup protocol in which the primary migrates to the process wanting to perform an update.

Active Replication (1)



The problem of replicated invocations

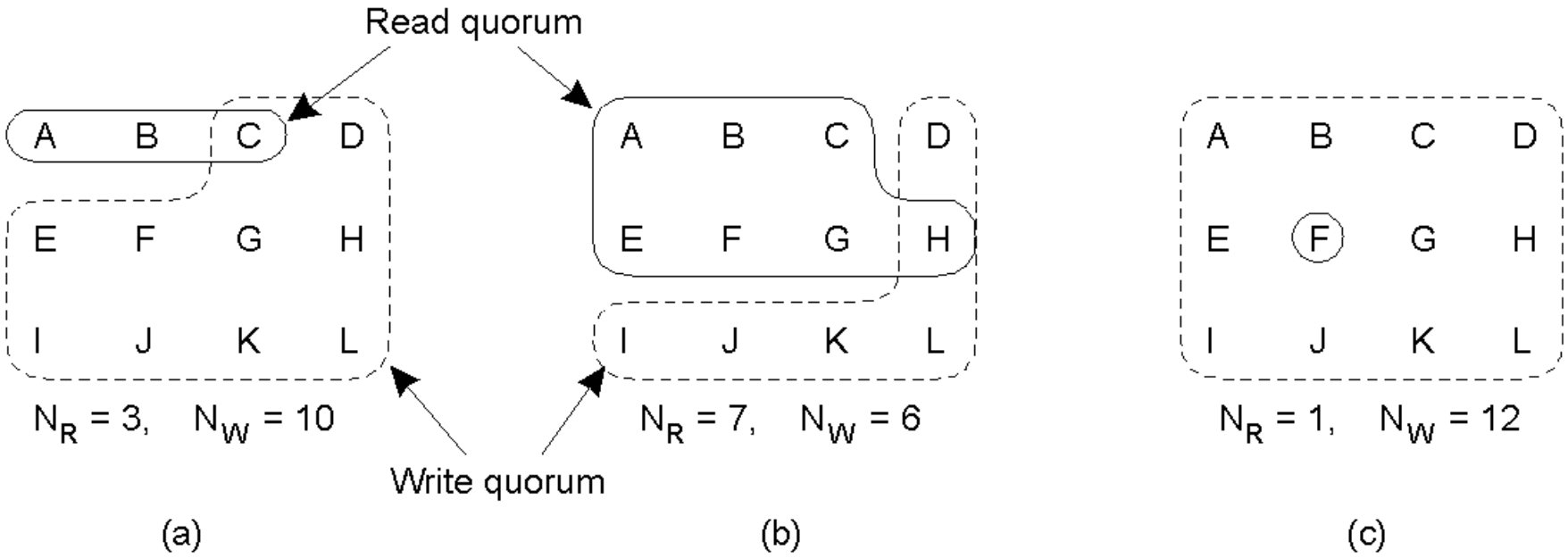
Active Replication (2)



a) Forwarding an invocation request from a replicated object.

b) Returning a reply to a replicated object.

Quorum-Based Protocols



Three examples of the voting algorithm:

a) A correct choice of read and write set

b) A choice that may lead to write-write conflicts

c) A correct choice, known as ROWA (read one, write all)