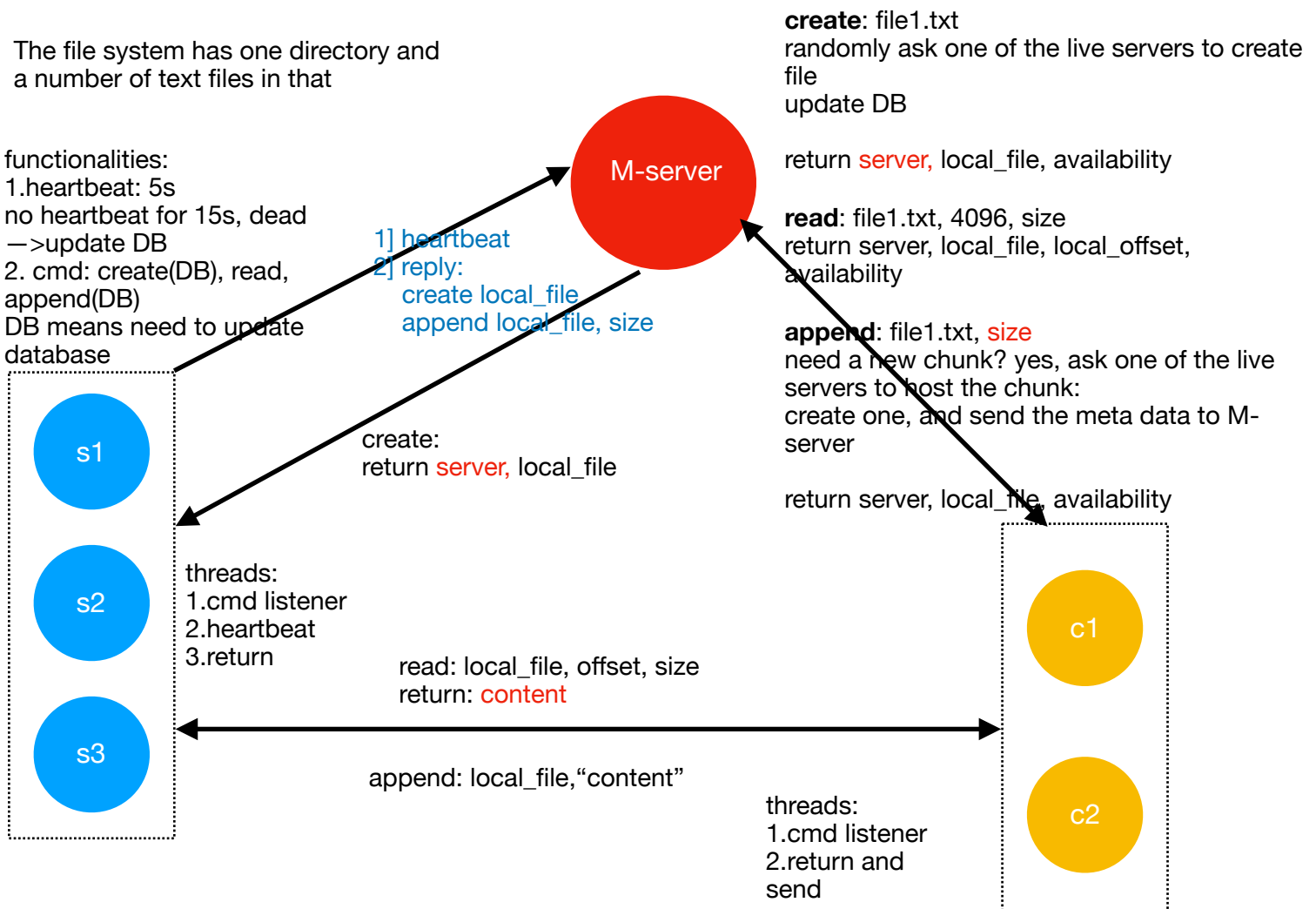| filename	chunk_id	chunk_size	local_file	server	avaiability	timestamp
file1.txt	1	8192	ABC	S3	1	
file1.txt	2	8192	DEF	S1	1	
file1.txt	3	4096	GHI	S2	1	
file2.txt	1	5	XYZ	S3	1	

primary key(filename, chunk_num)
timestamp: when was a chunk to server mapping last updated

The file system has one directory and
a number of text files in that

functionalities:
1.heartbeat: 5s
no heartbeat for 15s, dead
—>update DB
2. cmd: create(DB), read,
append(DB)
DB means need to update
database

create: file1.txt
randomly ask one of the live servers to create
file
update DB

return server, local_file, availability

read: file1.txt, 4096, size
return server, local_file, local_offset,
availability

append: file1.txt, size
need a new chunk? yes, ask one of the live
servers to host the chunk:
create one, and send the meta data to M-
server

return server, local_file, availability

M-server

s1

s2

s3

c1

c2

1] heartbeat
2] reply:
  create local_file
  append local_file, size

create:
return server, local_file

threads:
1.cmd listener
2.heartbeat
3.return

read: local_file, offset, size
return: content

append: local_file,"content"

threads:
1.cmd listener
2.return and
send

The maximum amount of data can be appended at a time is
2048 bytes.
8192 - S < appended data size: a new chunk

Test case:
1. normal
2. add servers, add clients
3. some server is unavailable
    turn off s1, c2 tries to read from s1
    c1 tries to append to s1
    Then turn on s1, c2 reads again.