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Quiz 4: Network File Systems (10 points), 10 minutes (morning section)

Consider NFS and assume all the files in the following question reside in a remote server. State the steps for implementing the following system functions (executed in sequence). Be sure to indicate the messages (**including details of RPC calls**) and data sent between client and server; and update to the client-side file-open table.

1. [6 points] int fd = open("/foo/more/bar.txt", O_**RDONLY**)

Client	***Server***
Fd =open("/foo/more/bar.txt"..)	
LOOKUP(rootdir, "foo")	
	Receive Lookup request
	Look for foo in root
	Return foo's fh plus attr
Receive lookup reply	
Allocate fd in open file table	
Store foo's fh in table	
LOOKUP(foo's fh, "more")	
	Receive Lookup request
	Look for more in root
	Return more's fh plus attr
Receive lookup reply	
Allocate fd in open file table	
Store more's fh in table	
LOOKUP(more's fh, "bar.txt")	
	Receive Lookup request
	Look for bar.txt in root
	Return bar.txt's fh plus attr
Receive lookup reply	
Allocate fd in open file table	
Store bar's fh in table	
Store current file position 0	
Return fd to application	

2. [4 points] int ret_in = read(fd, buffer, 4096)

Index into open file table with fd

Get NFS file handle FH

Use current file position as offset

READ(FH, offset=0, count=4096)

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Receive READ request

Use FH to get Vol/inode number

Read inode from disk/cache

Compute block location using offset

Read data from disk/cache

Return data to client

Receive READ reply

Update file position (+= bytes read)

Set current file position = 4096

Return data/error code to app