Server

- Start

- load filelist from .l

- push changes to disk
- send +commit back +sender

- start heartbeat to dependent +xns!
- wait for other txns to commit, abort, or timeout

- attempt to commit any dependent txns

- stop heartbeat to sender if exists

- send abort back to sender

- Print error

- Create file in cache (not on disk)
- return empty WD to sender

- remove sender from crashed nodes
- notify any +xns dependent on sender that are waiting to abort
- send start back to sender
- stop heartbeat to sender, if one exist s

- enqueue command in memory

- initialize cache

- remove node from list that has file checked out
- remove node from list waiting for WDs back from

- add dest to list of crashed clients

- enqueue WQ for later

- return error msg

- return last committed version

- all nodes WQs were sent to have returned or timed out
- remove node from list waiting for WDs or timeout

- propose version in WD

- return the proposed file with the highest version number to the original WD requester & any queued requesters

- send out WQs to all nodes that have copies
- propose server version

- remove node from list waiting for WDs back from

Labels on arrows:
- receive start
- receive commit-data
- receive create
- receive commit
- txn can commit
- txn is dependent on uncommitted txn
- txn has to abort
- receive ERROR
- code ID
- timeout error
- else
- pkt was HB
- pkt was WF
- receive WD
- receive WQ
- all nodes WQs were sent to have returned or timed out
- file is waiting on WQs
- file doesn't exist
- proposed file is more recent than last committed version
- some nodes have copies
- no node has copy checked out
- WD

State diagram (hand-drawn):

- receive start
- receive error
- receive commit
- receive abort

Client

start

- • Start txn • allow cmds to execute
- • commit txn locally • execute all queued cmds
- • Print error msg • Print results • clear cache
- reset txn + clear cache
- update contents of file locally w/ WD + add all queued cmds to txn
- receive WD
- receive WF
- command

- return Error to server
- file isn't in cache
- file is in cache
- send WD to server
- timeout → Print error

- Send start to server / start
- send abort to server / abort
- cmd is commit
- txn is trying to commit → Print Error
- txn is started
- another command is executing on this file → add cmd to File obj queue
- file is in local cache → add cmd to txn
- file isn't in local cache → Send WQ to Master Node
- Send up all cmds in txn + final commit pkt