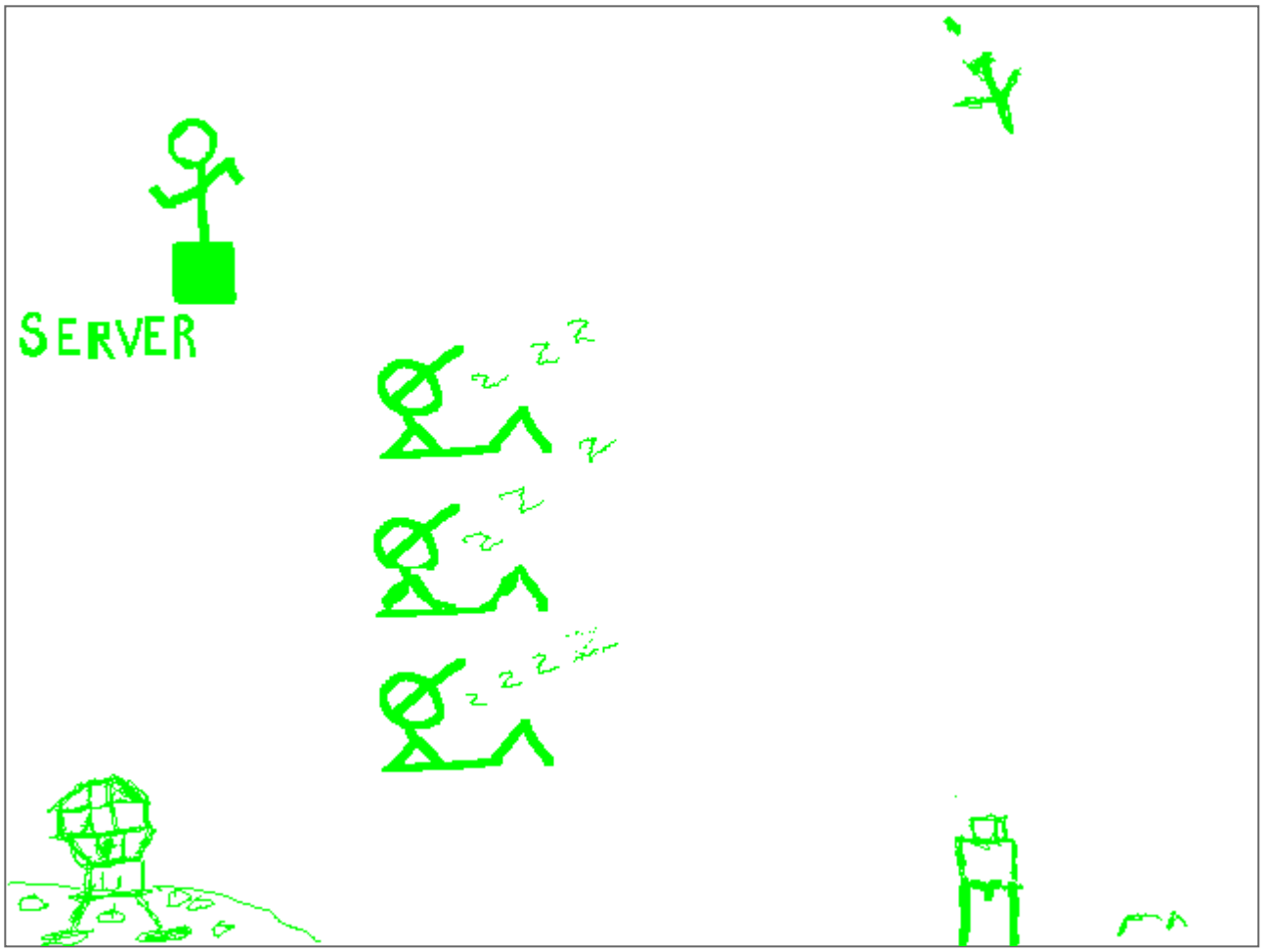
SOCKETSERVERTCL



Short review of TCP server programming

1. socket() // Creates a socket
2. bind() // Assign address
3. listen() // Join the network
4. accept() // Establish connection

Where to create worker processes?
Classic:
socket() bind() listen() accept() fork()
Pre-Fork:
socket() bind() listen() fork() accept()
SO_REUSEPORT:
exec()/fork() socket() bind() listen() accept()

Footnote

SO_REUSEPORT is in TCL TIP 465

OS HAS CONTROL WITH MULTIPLE LISTEN FDS

Multiple accepts are scheduled by OS

SO_REUSEPORT is hashed to processes by address.
Low number IP addresses low scalability on Linux
For a good implementation see Cloudflare's blogs

How to get classic single accept with multiple workers?

Exclusive locks and coordination - Apache
Proxy/Broker TCP in userspace
SCM_RIGHTS Apache mod and **socketservertcl**

What is SCM_RIGHTS?

Part of the Unix socket specification.

SCM_RIGHTS is a control message which can be sent over SOL_SOCKET.

Provides the ability to pass file descriptors.

SOCKETSERVERTCL

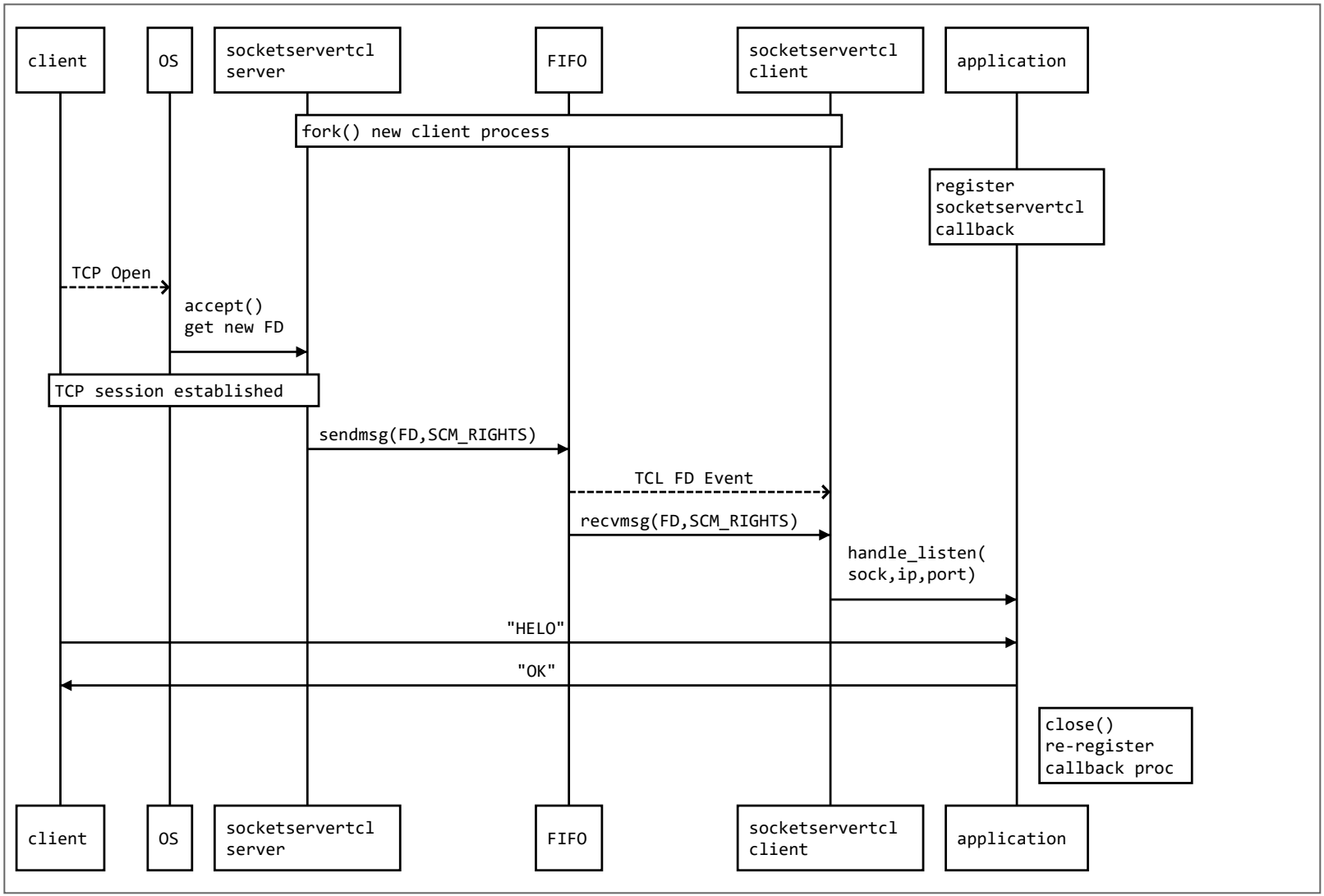
TCL extension which provides a means to send and receive SCM_RIGHTS messages.

This makes is possible to pass TCL sockets.

Programming model follows TCL's core socket command.

```
package require socketserver

::socketserver::socket server 9901

proc handle_readable ...

proc handle_accept {fd ipaddr port} {
        fileevent $fd readable [list handle_readable $fd]
}

proc make_worker {} {
  set pid [fork]
  if {$pid == 0} {
        # This is the child
        ::socketserver::socket client handle_accept
        vwait done
  }
}

make_worker

vwait done
```

```
proc handle_accept {fd} {
        fconfigure $fd -encoding utf-8 -buffering line -blocking 1 \
                        -translation lf
        while {1} {
            set line [gets $fd]
            if {[string first "quit" $line] != -1} {
                    break
            }
            puts $fd "[pid] $line"
        }
        puts "client closing socket"
        close $fd
        # Now that we have closed, we are ready for another socket
        ::socketserver::socket client -port 8888 handle_accept
}
```


client
OS
socketservertcl server
FIFO
socketservertcl client
application
fork() new client process
register socketservertcl callback
TCP Open
accept() get new FD
TCP session established
sendmsg(FD,SCM_RIGHTS)
TCL FD Event
recvmsg(FD,SCM_RIGHTS)
handle_listen(sock,ip,port)
"HELO"
"OK"
close() re-register callback proc
client
OS
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FIFO
socketservertcl client
application