Zeus IPC

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1 Definitions

1.1 Channels

server is a global channel for Clients to initiate conversation with the ClientHandler

c connects a specific Client to the ClientHandler

m connects the ClientHandler to a Command process

1.2 Client Handler

The Client Handler is the component of the master process which negotiates Client-initiated connections to Command processes.

$$CLIENTHANDLER = server?c \rightarrow c?command \rightarrow c?args \rightarrow c?clientpid \rightarrow c?tty \rightarrow m!tty \rightarrow m!args \rightarrow m!clientpid \rightarrow m?cmdpid \rightarrow CHEXIT$$

$$CHEXIT = m?exitstatus \rightarrow c!exitstatus \rightarrow STOP$$

1.3 Client

A Client is a user-initiated process which connects to the Master process, and wires up a command process's TTY to its I/O streams.

$$\begin{aligned} CLIENT = {} & server!c \rightarrow c!command \rightarrow c!args \rightarrow c!clientpid \rightarrow c!tty \\ & \rightarrow c?cmdpid \rightarrow CLIENTRUN \end{aligned}$$

$$CLIENTRUN = CLIENTIO \triangle CLIENTSIGNALS$$

$$\begin{aligned} CLIENTIO = {} & tty_a?data \rightarrow stdout!data \rightarrow CLIENTRUN \\ & \mid stdin?data \rightarrow tty_b!data \rightarrow CLIENTRUN \\ & \mid tty_a?eof \rightarrow CLIENTEXIT \end{aligned}$$

$$\begin{aligned} CLIENTSIGNALS = {} & sig?int \rightarrow cmdpid!int \rightarrow CLIENTRUN \\ & \mid sig?quit \rightarrow cmdpid!quit \rightarrow CLIENTRUN \\ & \mid sig?tstp \rightarrow cmdpid!tstp \rightarrow clientpid!tstp \rightarrow CLIENTRUN \end{aligned}$$

$$CLIENTEXIT = h?exitstatus \rightarrow STOP$$

1.4 Command

$$CMD = m?tty \rightarrow m?args \rightarrow m?clientpid \rightarrow m!cmdpid \rightarrow CMDRUN$$

$$\begin{aligned} CMDRUN = {} & stdin?data \rightarrow tty_a!data \rightarrow CMDRUN \\ & \mid tty_b?data \rightarrow stdout!data \rightarrow CMDRUN \\ & \mid cmdpid?exit \rightarrow STOP \end{aligned}$$

$$CMDEXIT = m!exitstatus \rightarrow STOP$$