Expect Automate interactive programs

START HERE

`spawn <cmd> [args]`
Start a program

`set timeout <sec>`
Change the 10 s wait

`expect "<pattern>"`
Wait for its output

`expect eof`
Wait for exit

`send "<text>\r"`
Type into it

`expect -f <script>`
Run a script file

`interact`
Hand over the keyboard

`autoexpect <cmd>`
Record a session

spawn start program on a pty → *output* → **expect** match pattern → *action* → **send** type the reply → *repeat* → **interact / eof** hand over or finish

CONCEPTS

Expect scripts are Tcl: spawn a program, then loop on expect (wait for text) and send (type a reply).

Send \r (Enter), not \n, when answering prompts: the program sees a terminal, and Enter is a carriage return.

Patterns are globs by default, so * matches anything. Use -re for regexps and -ex for exact text.

Expect only sees output on a pty; pipes and prompts that read /dev/tty directly still work because spawn gives the child a terminal.

RUNNING

`expect <script> [args]`
Run a script file

`expect -d <script>`
Run with diagnostic output
Shows what is matched against which pattern; the first tool when a script hangs.

`#!/usr/bin/env expect`
Shebang for executable scripts

`autoexpect [-f <out>] <cmd>`
Record a session as a script

`unbuffer <cmd>`
Run a command with a pty attached

SPAWN AND SEND

`spawn <cmd> [args]`
Start a program on a pty

`spawn -noecho <cmd>`
Spawn without echoing the command line

`send "<text>\r"`
Type text and press Enter

SPAWN AND SEND (cont.)

`send -- "<text>"`
Send text that starts with a dash

`send -s "<text>"`
Send slowly (uses send_slow)

`send -i $<id> "<text>"`
Send to a specific spawn id

`send_user "<text>"`
Print to your terminal

`set <id> $spawn_id`
Save the current spawn id

`wait`
Reap the process, get its exit status

`exit [<status>]`
Exit the script

`sleep <sec>`
Pause (decimals allowed)

EXPECT PATTERNS

`expect "<glob>"`
Wait for output matching a glob

`expect -re "<regexp>"`
Wait for a regexp match

`expect -ex "<text>"`
Wait for exact text, no wildcards

`expect eof`
Wait for the process to end

`expect timeout { <cmds> }`
Run commands when the wait times out

`expect { "a" {<cmds>} "b" {<cmds>} }`
Several patterns, first match wins

`exp_continue`
Keep matching after an action
Resets the timeout; add -continue_timer to keep the running clock.

`expect -timeout <sec> "<pat>"`
Timeout for this one wait

EXPECT PATTERNS (cont.)

`expect_before { <pat> {<cmds>} }`
Patterns tried before every expect

VARIABLES

`set timeout <sec>`
Default wait; -1 waits forever

`$expect_out(buffer)`
Output consumed by the last match

`$expect_out(0,string)`
Text of the whole match

`$expect_out(1,string)`
First -re capture group

`$spawn_id`
Id of the current process

`$argv / $argc / $argv0`
Script arguments, count, name

`lindex $argv <n>`
Get argument number n

`$env(<NAME>)`
Read an environment variable

INTERACT

`interact`
Give the keyboard to the process

`interact { "<key>" { <cmds> } }`
Run commands when you type a string

`interact timeout <sec> { <cmds> }`
Act after idle seconds

`return`
Leave interact, continue the script

`log_user 0`
Hide the process output from you

`stty -echo`
Turn off echo (for passwords)

`expect_user -re "(.*)\n"`
Read a line typed by the user

LOGGING, DEBUG AND SIGNALS

`exp_internal 1`
Print match diagnostics to stderr

`log_file <file>`
Record the session to a file

TCL ESSENTIALS

`set <var> <value>`
Assign a variable

`foreach h $hosts { ... }`
Loop over a list

`proc <name> {<args>} { ... }`
Define a procedure

`regexp {<re>} $str → a b`
Match, capture into variables

`[exec <cmd>]`
Run a command and capture output

RECIPES

Login over ssh

```
set timeout 20
spawn ssh <user>@<host>
expect {
 "yes/no" {
  send "yes\r"
  exp_continue }
 "assword:" {
  send "$env(PW)\r" }
}
interact
```

Run one command and capture output

```
spawn ssh <host> uptime
expect -re {average: ([0-9.]+)}
puts $expect_out(1,string)
expect eof
```

Exit code of the spawned program

```
spawn <cmd>
expect eof
lassign [wait] pid id os rc
exit $rc
```