Using *Expect* to Automate System Administration Tasks

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"I'm from the government and I'm here to hack"

UNIX programs *were*

Traditionally noninteractive

- **good for pipe building**
- **good for shell scripts**

Rarely interactive–only

- **bad for pipe building**
- **bad for shell scripts**

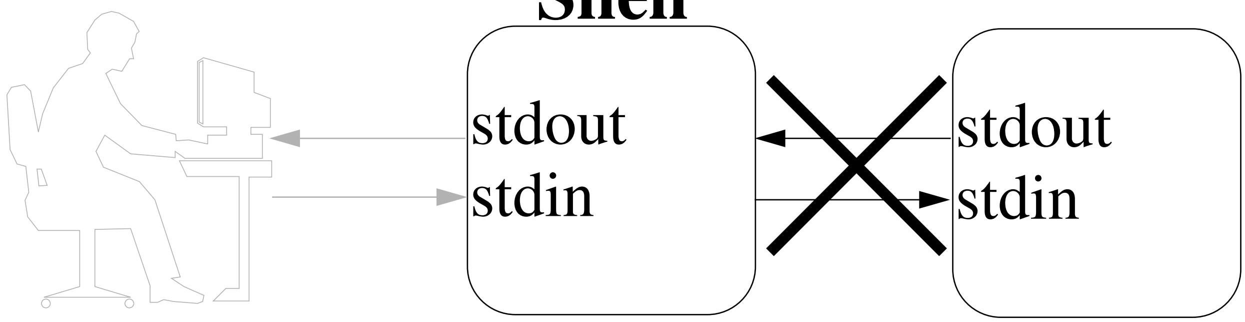
Classic example of a program that doesn’t fit: passwd

- **ignores redirection**
- **does not take (the right) parameters**

Is this really desirable?

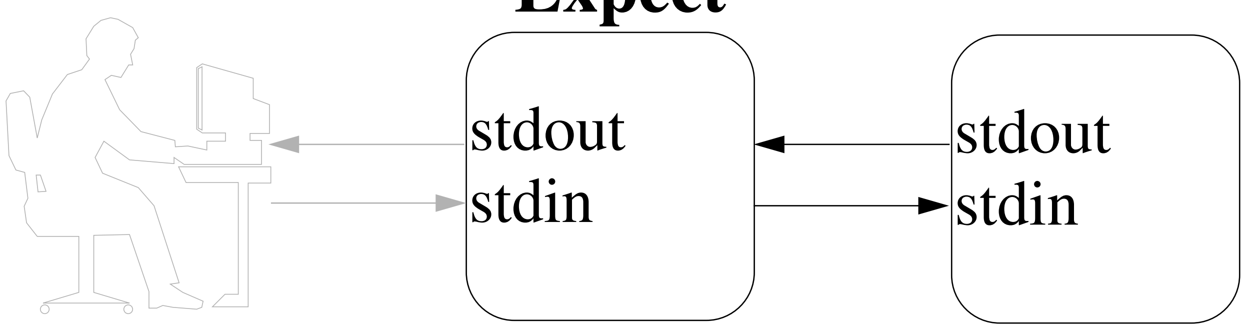
Shell vs. Expect

Shell



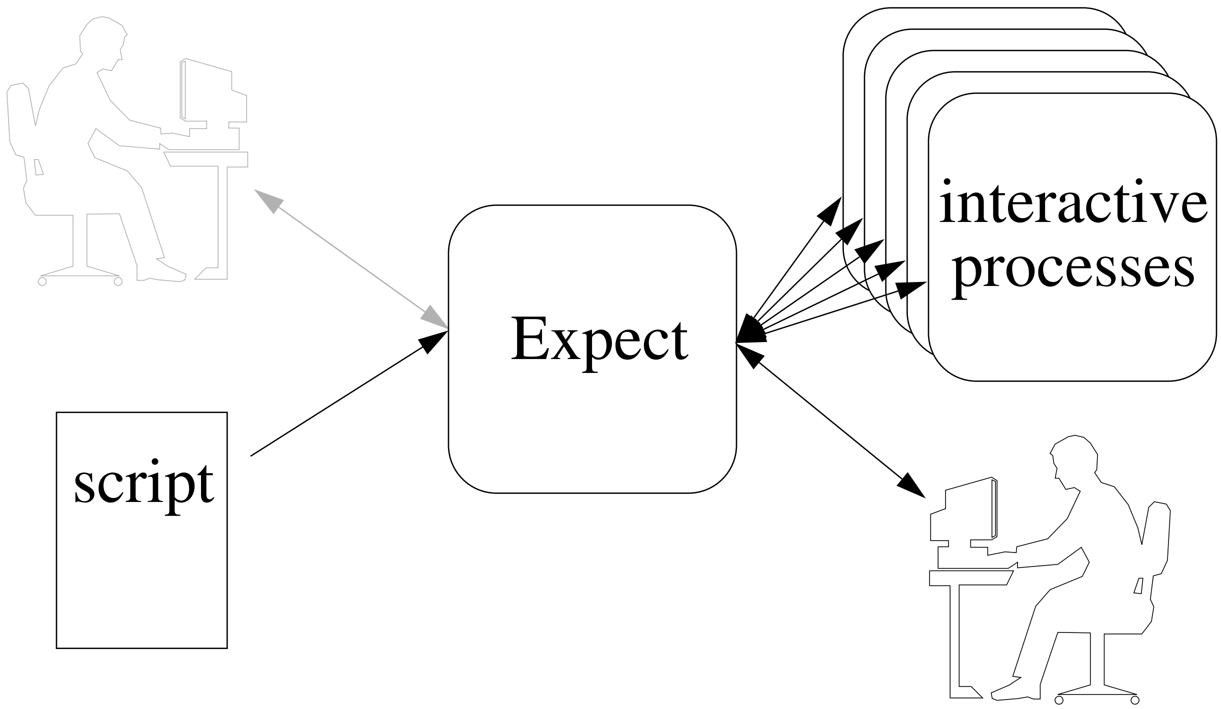
- designed for one-way pipes
- can’t interact with interactive programs

Expect



- designed for any-way pipes
- can interact with interactive programs

Features of Expect



- **pseudottys**
- **job control**
- **scripting language – Tcl**
- **user interaction**

Scripting language

Tcl: a shell-like extensible interpreter by Ousterhout, Winter 1990 USENIX

New and interesting commands are:

- **spawn**
- **send**
- **Expect**
- **interact**

Example: passwd

```
set password [index $argv 2]
spawn passwd [index $argv 1]
expect "*password:"
send "$password\r"
expect "*password:"
send "$password\r"
expect eof
wait
```

Example: callback

```
spawn tip modem
expect "connected"
send "ATDT[index $argv 1]\r"
set timeout 60
expect "CONNECT"
```

Example: fsck

```
while 1 {
    expect {
        eof                         break
        "UNREF FILE CLEAR? "        {send "y\r"}
        "BAD INODE FIX? "           {send "y\r"}
        "? "                        {send "n\r"}
    }
}
```

Example: fsck

```
while 1 {
    expect {
        eof                        break
        "UNREF FILE CLEAR? "       {send "y\r"}
        "BAD INODE FIX? "          {send "n\r"}
        "? "                       {interact +}
    }
}
```

More examples:

- regression testing
- automating logins
- dealing with lousy interfaces
- administering non-UNIX systems

- read Anaheim ’90 USENIX paper for even more examples

Conclusion

Expect automates many system administration tasks.

PS: It automates many non-SA tasks, too.

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"Hard at work creating the standard core dump"