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**

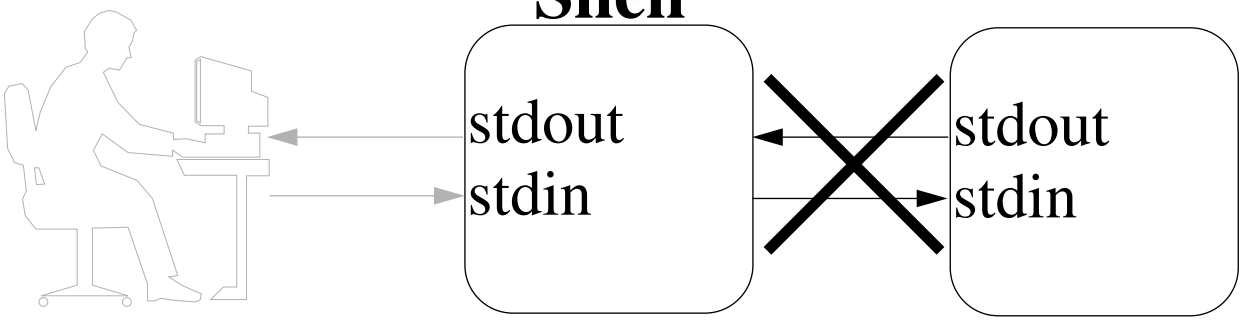
Classic example of a program that doesn't fit: passwd

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

Is this really desirable?

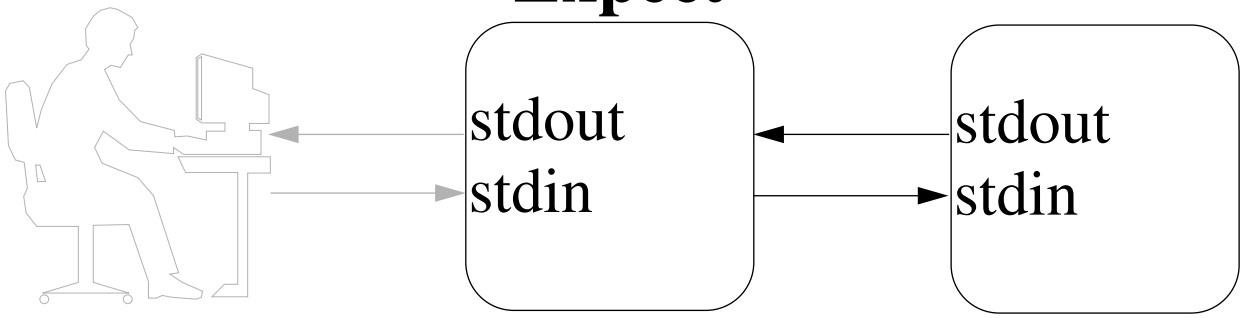
Shell vs. Expect

Shell



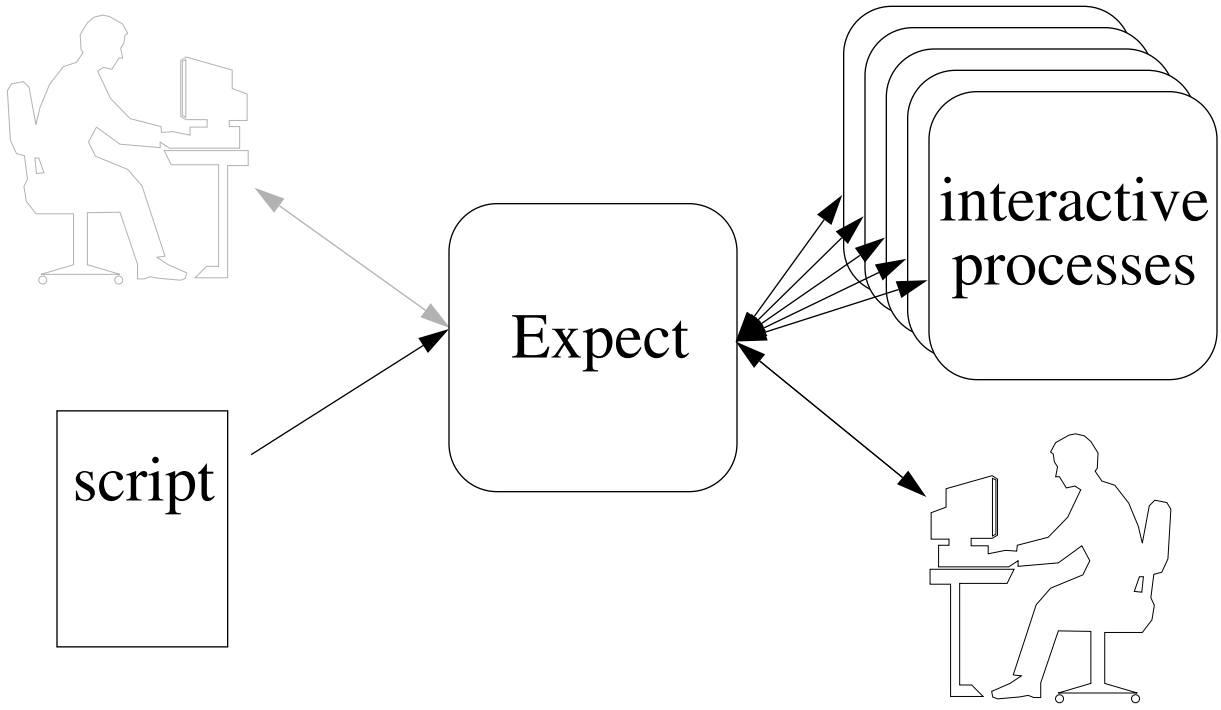
- **designed for one-way pipes**
- **can’t interact with interactive programs**

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"