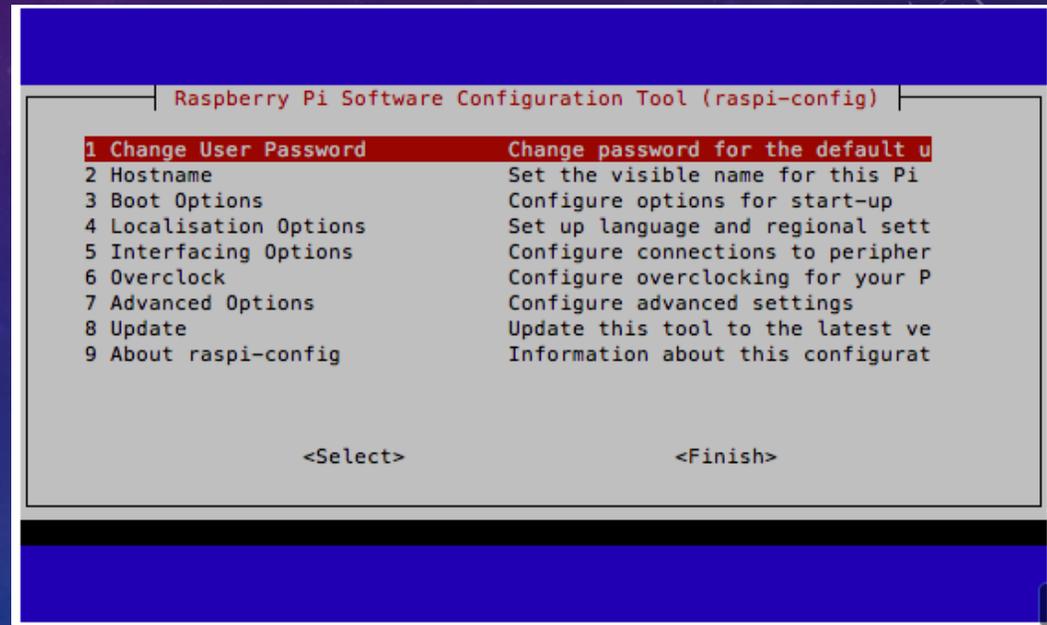


The background features a dark blue gradient with a subtle pattern of white dots. Overlaid on this are several circular elements: a large scale on the left with numerical markings from 140 to 260, and several smaller circles with dashed lines and arrows, suggesting a technical or scientific theme.

INITIAL RASPBERRY PI CONFIGURATION USING THE COMMAND LINE

INITIAL RASPBERRY PI CONFIGURATION

- Each time I set up a new Raspberry Pi, I have to run raspi-config to:
 - Change Locale
 - Change Time Zone
 - Change Keyboard Layout
 - Change Wi-Fi Country
 - Enable SSH
 - Change pi Password



RASPI-CONFIG FROM THE COMMAND LINE

```
#!/bin/sh
# Part of raspi-config https://github.com/RPi-Distro/raspi-config
#
# See LICENSE file for copyright and license details

INTERACTIVE=True
ASK_TO_REBOOT=0
BLACKLIST=/etc/modprobe.d/raspi-blacklist.conf
CONFIG=/boot/config.txt

is_pi () {
    grep -q "^model name\s*:\s*ARMv" /proc/cpuinfo
    return $?
}

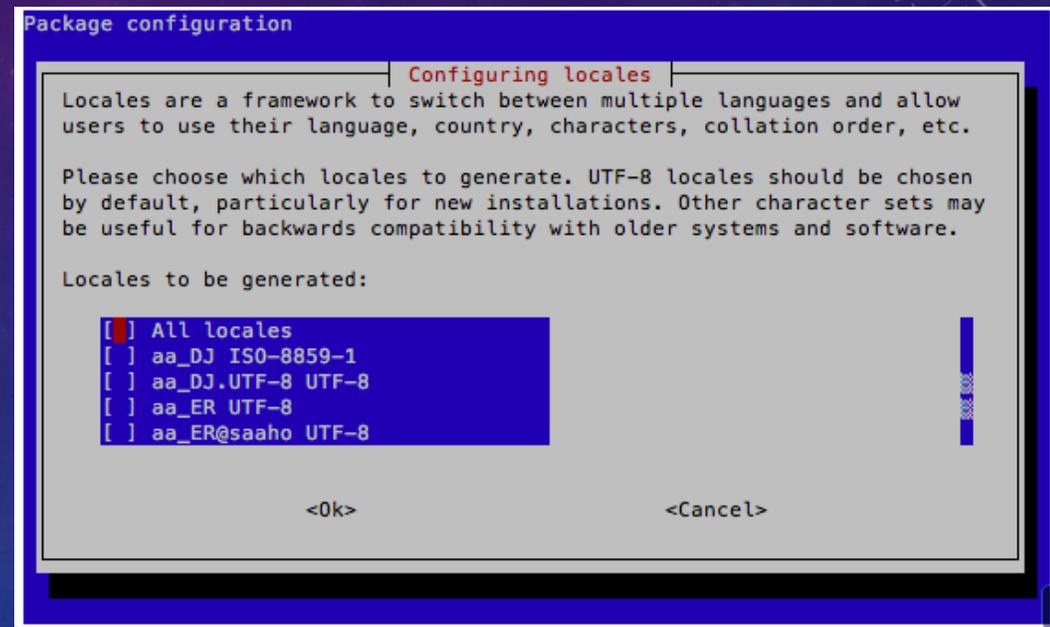
if is_pi ; then
    CMDLINE=/boot/cmdline.txt
else
    CMDLINE=/proc/cmdline
fi

is_pione() {
    if grep -q "^Revision\s*:\s*[0-9a-fA-F][0-9a-fA-F]" /proc/cpuinfo; then
--More--(0%)
```

- Like any good engineer, I want to automate as much as possible
- raspi-config is a shell script
 - <https://github.com/RPi-Distro/raspi-config>
- I should be able to pull out and create a custom script to initialize the Raspberry Pi

THE ISSUE WITH DPKG-RECONFIGURE

- Much of Raspbian configuration is done through dpkg-reconfigure
 - By default, dpkg-reconfigure displays a character-based user interface that must be navigated using the keyboard
 - For example, to change the locale, you use “sudo dpkg-reconfigure locales”



THE SOLUTION TO DPKG-RECONFIGURE

```
pi@raspberrypi:~/tmp $ sudo dpkg-reconfigure -freadline locales
Configuring locales
-----

Locales are a framework to switch between multiple languages and allow users to
use their language, country, characters, collation order, etc.

Please choose which locales to generate. UTF-8 locales should be chosen by
default, particularly for new installations. Other character sets may be useful
for backwards compatibility with older systems and software.

1. All locales                238. gl_ES ISO-8859-1
2. aa_DJ ISO-8859-1          239. gl_ES.UTF-8 UTF-8
3. aa_DJ.UTF-8 UTF-8        240. gl_ES@euro ISO-8859-15
4. aa_ER UTF-8              241. gu_IN UTF-8
5. aa_ER@saaho UTF-8        242. gv_GB ISO-8859-1
6. aa_ET UTF-8              243. gv_GB.UTF-8 UTF-8
7. af_ZA ISO-8859-1          244. ha_NG UTF-8
8. af_ZA.UTF-8 UTF-8        245. hak_TW UTF-8
9. ak_GH UTF-8              246. he_IL ISO-8859-8
10. am_ET UTF-8             247. he_IL.UTF-8 UTF-8
11. an_ES ISO-8859-15       248. hi_IN UTF-8
12. an_ES.UTF-8 UTF-8       249. hne_IN UTF-8

[More]
```

- You can get dpkg-reconfigure to display a basic command line interface using the -freadline option.
- Now “sudo dpkg-reconfigure -freadline locales” displays a user interface that doesn’t require screen navigation.
- But, you must still “read” the screen and “enter” the correct options.
 - You can’t perform selections from the command line of the dpkg-reconfigure command (that I’ve found)

EXPECT TO THE RESCUE

- I haven't used the "expect" command in a long time.
- It is basically a command that reads the screen and can enter input based on what it reads.
 - Is "screen scraping" a term still used?
- I build scripts to navigate the output of dpkg-reconfigure and provide appropriate input

```
cat << EOF | sudo /usr/bin/expect &&
#!/usr/bin/expect -f
spawn dpkg-reconfigure --freadline locales
# This pattern of a "while true" with the "expect" looking for "More] "
# occurs multiple times in this script and is used to detect pagination
# that may occur when using a "standard" size SSH terminal
while true {
    expect {
        "More] " {
            send "\n"
        }
        "Locales to be generated: " {
            send "146\n"
            break
        }
    }
}
expect "Default locale for the system environment: "
send "1\n"
expect eof
EOF
```

█

INITRPI.SH SCRIPT, PART 1

```
#!/bin/sh
sudo apt-get update
sudo apt-get dist-upgrade --yes --force-yes

sudo apt-get install --yes --force-yes expect

sudo echo "LANG=en_US.UTF-8" > /tmp/locale.new
sudo mv /tmp/locale.new /etc/default/locale

cat << EOF | sudo /usr/bin/expect &&
#!/usr/bin/expect -f
spawn dpkg-reconfigure -freadline locales
# This pattern of a "while true" with the "expect" looking for "More| "
# occurs multiple times in this script and is used to detect pagination
# that may occur when using a "standard" size SSH terminal
while true {
    expect {
        "More| " {
            send "\n"
        }
        "Locales to be generated: " {
            send "146\n"
            break
        }
    }
}
expect "Default locale for the system environment: "
send "1\n"
expect eof
EOF

cat << EOF | sudo /usr/bin/expect &&
```

INITRPI.SH SCRIPT, PART 2

```
#!/usr/bin/expect -f
spawn dpkg-reconfigure -freadline tzdata
expect "Geographic area: "
send "12\n"
expect "Time zone: "
send "4\n"
expect eof
EOF

cat << EOF | sudo /usr/bin/expect &&
#!/usr/bin/expect -f
spawn dpkg-reconfigure -freadline keyboard-configuration
# This pattern of a "while true" with the "expect" looking for "More] "
# occurs multiple times in this script and is used to detect pagination
# that may occur when using a "standard" size SSH terminal
while true {
    expect {
        "More] " {
            send "\n"
        }
        "Keyboard model: " {
            send "67\n"
            break
        }
    }
}
expect {
    "1. English (UK)" {
        while true {
            expect {
                "More] " {
                    send "\n"
                }
            }
        }
    }
}
```

INITRPI.SH SCRIPT, PART 3

```
    }  
    "Keyboard layout: " {  
        send "9\n"  
        break  
    }  
}  
}  
while true {  
    expect {  
        "More|" {  
            send "\n"  
        }  
        "Country of origin for the keyboard: " {  
            send "29\n"  
            break  
        }  
    }  
}  
while true {  
    expect {  
        "More|" {  
            send "\n"  
        }  
        "Keyboard layout: " {  
            send "1\n"  
            break  
        }  
    }  
}  
}  
} "1. English (US)" {  
    while true {
```


INITRPI.SH SCRIPT, PART 5

```
        fi
    else
        echo "country=$COUNTRY" > /etc/wpa_supplicant/wpa_supplicant.conf
    fi
fi
IFS=$oIFS

sudo update-rc.d ssh enable &&
sudo invoke-rc.d ssh start &&

cat << EOF | /usr/bin/expect &&
#!/usr/bin/expect -f
spawn passwd pi
expect "(current) UNIX password: "
send "raspberrypi\n"
expect {
    "Enter new UNIX password: " {
        send "SECRET\n"
        expect "Retype new UNIX password: "
        send "SECRET\n"
    }
    "password unchanged" {
    }
}
expect eof
EOF

echo DONE.

sudo reboot
```

KNOWN ISSUES

- The use of “expect” can be brittle
 - If the user interface changes, the script will break.
 - For example, if the option number for the en_US.UTF-8 locale changes, the script will not yield the desired configuration
- The error handling in my initrpi.sh script is admittedly very weak