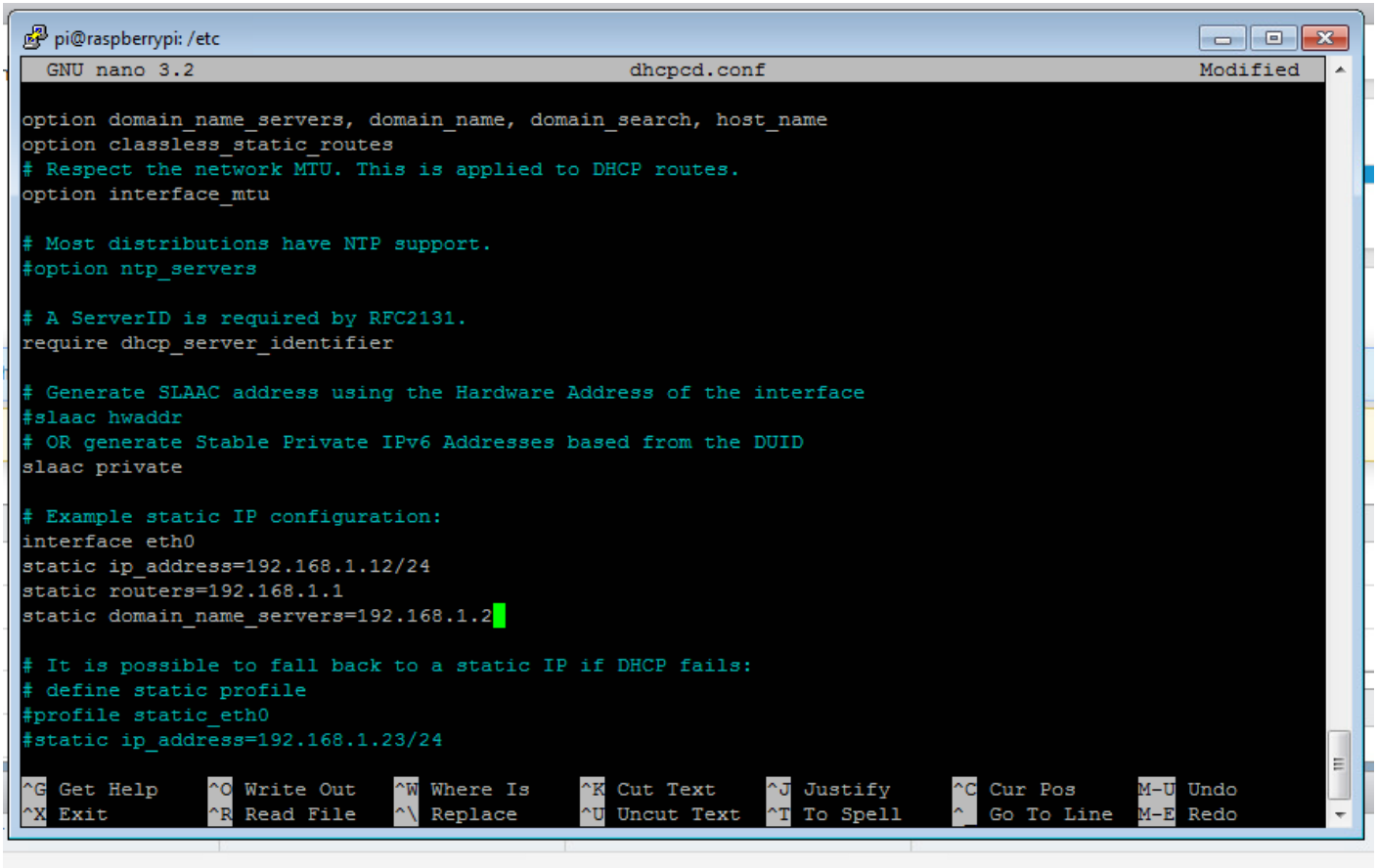
Local GPS NTP Time Server

Accessible at: 192.168.1.12
Project files stored here: “\\192.168.1.11\zfs_mirror3\Projects\Dormant\NTP Raspberry Pi Server”

Build Data

Runs Raspian on a Raspberry PI

Static IP Address was set in: /etc/dhcpcd.conf



Installed ntpstat with this:

```
sudo apt install ntpstat
```

Usage

Here's some descriptions of the different tools for administrating NTP.

NTPSTAT

Use ntpstat to check if the NTP service is in sync:

```
ntpstat
```

It will return something like this:

```
synchronised to NTP server (149.20.54.20) at stratum 3
   time correct to within 42 ms
   polling server every 1024 s
```

For our local NTP server (with GPS receiver), we see this:

```
pi@raspberrypi:~ $ ntpstat
synchronised to UHF radio at stratum 1
   time correct to within 2 ms
   polling server every 64 s
```

The ntpstat utility also returns an exit status, as a quick tell of synchronization.

Use this, following a call to ntpstat:

```
echo $?
```

The return value will mean one of these:

- If exit status 0 – Clock is synchronised.
- exit status 1 – Clock is not synchronised.
- exit status 2 – If clock state is indeterminant, for example if ntpd is not contactable.

NTPQ

Use ntpq -p to see the following:

```
pi@ntp1pi:~ $ ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 0.debian.pool.n .POOL.          16 p    -   64    0    0.000    0.000   0.001
 PPS(0)          .PPS.            0 l    -   16    0    0.000    0.000   0.000
*SHM(0)          .GPS.            0 l    9   16   17    0.000   -3.132   4.114
 casadeyork.com  163.237.218.19   2 u   25   64    1   28.394  -19.914   0.001
 time.cloudflare 10.4.0.197       3 u   22   64    1   18.746  -19.056   0.001
 squeakycode.net 128.194.254.9    3 u   23   64    1   69.353  -13.644   0.001
 europa.ellipse. 128.252.19.1     2 u   20   64    1   63.242  -21.382   0.001
pi@ntp1pi:~ $
```

PPTSTEST

Use this to test the pps signal:
sudo ppstest /dev/pps0

The output should spit out a new line every second that looks something like this (your output will be a bit farther from x.000000 since it isn't yet using the GPS PPS):

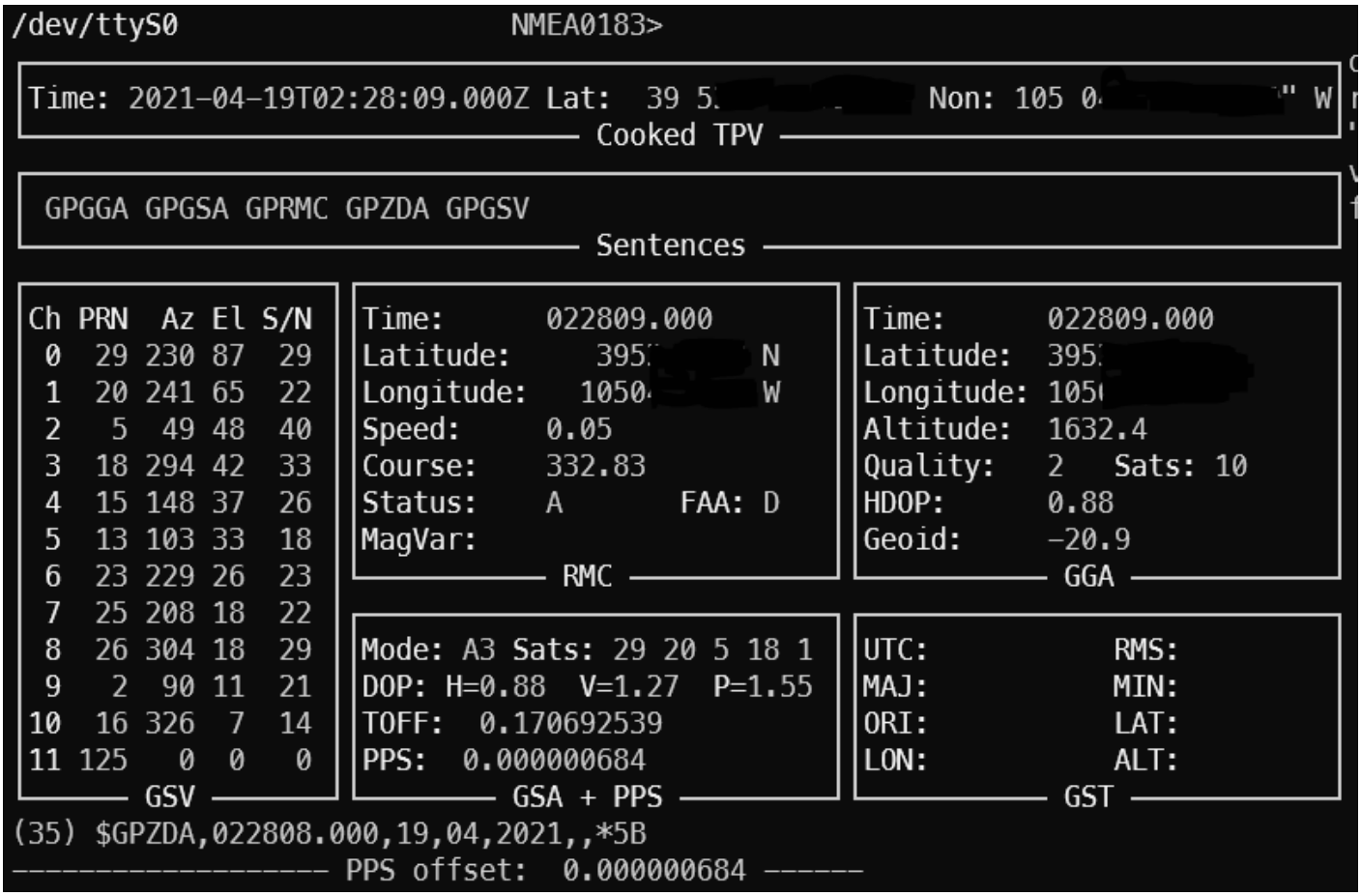
```
1.  pi@pi-ntp:~ $ sudo ppstest /dev/pps0
2.  trying PPS source "/dev/pps0"
3.  found PPS source "/dev/pps0"
4.  ok, found 1 source(s), now start fetching data...
5.  source 0 - assert 1618799061.999999504, sequence: 882184 - clear  0.000000000, sequence: 0
6.  source 0 - assert 1618799062.999999305, sequence: 882185 - clear  0.000000000, sequence: 0
7.  source 0 - assert 1618799063.999997231, sequence: 882186 - clear  0.000000000, sequence: 0
8.  source 0 - assert 1618799064.999996827, sequence: 882187 - clear  0.000000000, sequence: 0
9.  source 0 - assert 1618799065.999995852, sequence: 882188 - clear  0.000000000, sequence: 0
10. ^C
```

GPSMON

Use the gps monitor function to check the realtime availability of GPS and satelite count and position, with this:

```
gpsmon
```

This will present the following:

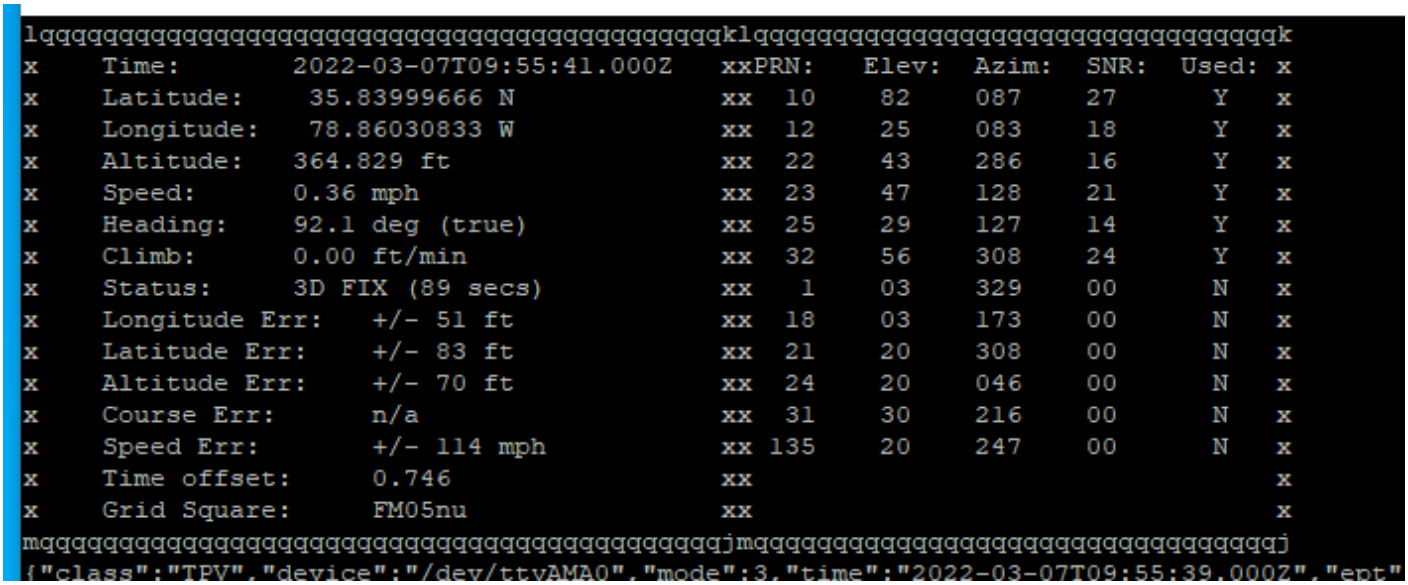


CGPS

Or, using the following for a simpler gps status check:

```
cgps
```

This will create the following output:



References

How to troubleshoot an NTP server: https://support.ntp.org/Support/TroubleshootingNTP

The following link is probably not what was used to build the house time server. But, this is an interesting reference on how to build a Raspberry pi GPS time server:

Building a Raspberry Pi Stratum 1 NTP Server

Here’s a good reference on how to tune and configure the NTP setup on a RaspBerry PI: Building a Raspberry-Pi Stratum-1 NTP Server

Another reference: Millisecond accurate Chrony NTP with a USB GPS for $12 USD - Austin's Nerdy Things

Good reference on the Shared Memory Driver, and how the 127.127.28.x address is used:

http://doc.ntp.org/archives/drivers/driver28/

Revision #5
Created 4 September 2025 04:08:59 by glwhite
Updated 4 September 2025 05:21:31 by glwhite