

trx-control Application Notes

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This document is a loose collection of application- and device notes.

Sharing a GPS device between trx-control and other applications

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This application note explains how to configure `trx-control` to get GPS information from `gpsd` instead directly from a GPS device.

Context

Usually, GPS devices present themselves as a serial device to the computer. One characteristic properties of serial devices are that they can only be access by one application at a time. This becomes an issue for devices like a GPS. Usually we want to make the position available to multiple applications at the same time (for example `chronyd` to update our system time, a map for navigation, our logging software to have the correct grid square in for our QSOs).

To solve this dilemma, the software `gpsd` has been created. As of October 2024, `trx-control` can not use `gpsd` as position source. With a bit of clever Linux configurations, we can work around this. As a bonus, we also get hot plug support.

Idea

- `gpsd` connects to the GPS device as it is intended to do
- a virtual serial device is created
- the NMEA data get streamed from `gpsd` into that virtual serial device
- `trx-control` is configured to read NMEA data from that virtual serial device

Solution

- `gpspipe` allows streaming the NMEA data from `gpsd`
- `socat` is a powerful tool to transfer data between a plethora of sources and targets.
- a Systemd unit ensures the virtual serial device is present before `trxd` starts

```
[Unit] Description=Virtual nmea serial device for trx-control
Requires=gpsd.service
After=gpsd.service
Before=trxd.service

[Service]
ExecStart=/bin/sh -c 'gpspipe --nmea | socat stdin pty,link=/dev/trxd-nmea,mode=666'

[Install]
RequiredBy=trxd.service
```

Instructions

1. Place the above Systemd unit at `/etc/systemd/system/trxd-nmea`
2. Reload Systemd: `sudo systemctl daemon-reload`
3. Enable the Systemd unit: `sudo systemctl enable trxd-nmea`
4. Configure `/dev/trxd-nmea` as NMEA device in the `nmea:` section of your `trxd` configuration file
5. Restart `trxd`: `sudo systemctl restart trxd`

Explanation

- `gpspipe --nmea` reads position data from `gpsd` and writes NMEA sentences to standard out.
- `socat stdin pty` creates a PTY device and writes anything from STDIN to that PTY. This creates a device named `/dev/pts/<N>` where `<N>` is a random number.
- To prevent us from changing the configuration of `trxd` every time, `link=/dev/trxd-nmea` creates a stable link to that device.
- `mode=666` makes the device readable by all users.
- `Requires=gpsd.service` and `After=gpsd.service` ensures `gpsd` gets started and is up and running before this unit can start.
- `RequiredBy=trxd.service` and `Before=trxd.service` ensures this unit gets started before and is running before `trxd` gets started.

Contribute to the Application Notes

Required Format

If you want to contribute an application or device note, please send it in the following format for inclusion:

- Use AsciiDoctor (.adoc) format
- Wrap lines at 72 characters