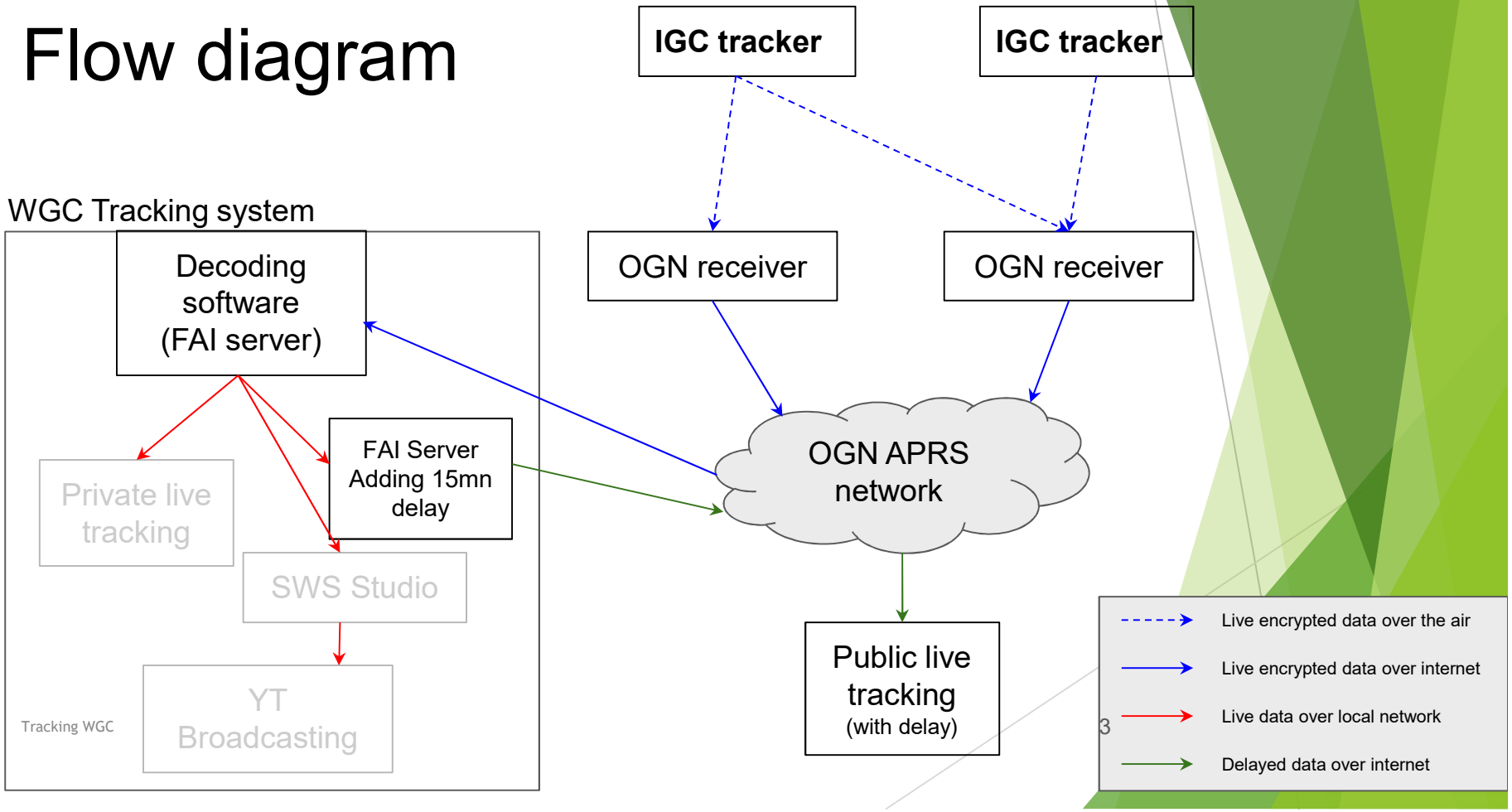
Tracking WGC

Solution to set up for the WGC championships

OGN/IGC trackers

- IGC will provide **120** OGN/IGC trackers.
- Those OGN trackers could be sending encrypted data over the air.
- OGN receivers need to get this information to transmit it to OGN APRS servers.
- WGC tracking system will get this data still encrypted, so need to run software to decode it. The FAI server does that job.
- The FAI server will reinject the information already decoded with 15-20 mins delay to OGN APRS network.

Flow diagram



IGC trackers setup

To achieve this setup we need to configure each IGC tracker with a specific encryption key. This is done prior to the contest and if we have time, it can be changed between days of the contest. The IGC Bureau will provide the encryption keys on an encrypted file.

The software is on the FAI server http://glidertracking.fai.org

The source code is on the GitHub repo:

https://github.com/acasadoalonso/OGN-IGC-Trackers-setup

The decoding software

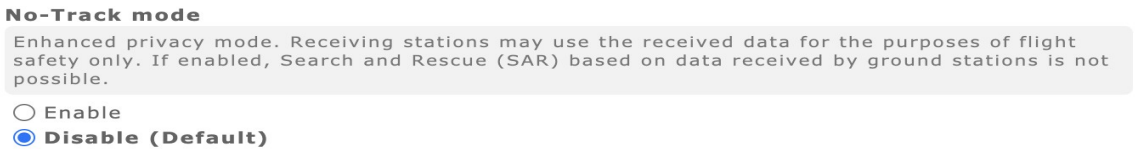
- The decoding software runs in the FAI server, gets the encrypted positions, decrypts/decodes the data and reinjects the position data with 15-20 minutes delay back to the OGN APRS servers

- The source code is at the GitHub repo:

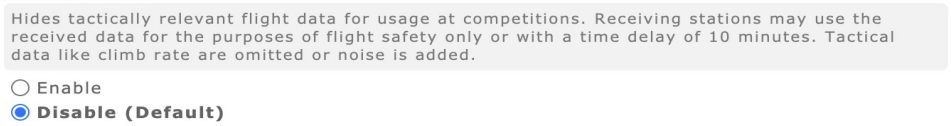
- https://github.com/acasadoalonso/SGP-2D-Live-Tracking-data-gathering/blob/master/dlym2ogn.py

Flarm (the setup is up to the pilot choice)

- Flarm of competitors gliders are recommended to be setup in **No-Track mode**
- So they can't be used for the tracking.



- Flarms can use the stealth mode



- Flarms can use the competition mode

Flarm recommended settings for WGC

- NOTRACK mode ON
- COMP mode ON
- STEALTH mode ON
- Random ID ➔ ID ICAO = 0 (it will change the radio ID every few minutes)

OGN/IGC Trackers setup

OGN-IGC-Trackers-setup

OGN/IGC Trackers setup utilities

This is a set of utilities to do the setup of OGN/IGC trackers for the WGC.

Install the TRKsetup software

- Get a fresh installation of a RaspberryPi, https://www.raspberrypi.com/software/
- Raspberry Pi OS Lite (ARM32)
- Release date: January 28th 2022 or later
- System: 32-bit
- Kernel version: 5.10
- Debian version: 11 (bullseye)
- Size: 482MB
- we suggest to call the server as **TRKsetup**, user pi, password OGNOGN, but any choice will work.
- You can use as well, the ARM64 version or do it in a UBUNTU64 version

Installation procedure

- **Once that the RPi is installed, do the following LINUX commands:**
- ssh pi@TRKsetup.local # ssh into the RPi
- mkdir OGN # make the working directory
- cd OGN # go to the new directory
- wget glidertracking.fai.org/dist/V1.0/TRKtools.tgz or TRKtools.zip # get the software from FAI server
- wget glidertracking.fai.org/dist/V1.0/esp32-ogn-tracker-bin.tgz
- tar xvfz esp32-ogn-tracker-bin.tgz # extract the tracker firmware
- **Connect the tracker with the USB cable to one of the 4 USB ports of the RPi**
- **Type the following command:**
- dmesg # display the console messages
- **and check on which port the tracker has been connected, normally ttyUSB0, if not update the flash_USB0 script accordingly.**

Installation procedure

- bash flash_USB0.sh # flash the new firmware into the tracker
- tar xvzf TRKtools.tgz # extract the TRKtools
- cd dist # go to the dist directory
- cp TRKSconfig.ini.template TRKSconfig.ini # and review the settings
- ./TRKsetup.Linuxarmv7l -h # check that works
- **# the name of the program is TRKsetup.xxxyyy where xxx is the opsys and yyy is the architecture of the server**
- ./TRKsetup.Linuxarmv7l --setup ON --reg ON # do the setup with registration on the FAI server

OGN/IGC trackers flight log

- The OGN/IGC Trackers are provided with a MicroSD card, so the flight is logged on a file with the .IGC format suitable to be analyzed.
- The flights are stored at the **IGC** directory within the root of the MicroSD card.
- The **VALI-AVX** program can be used to validate the integrity of the .IGC file
- Usage from the RPi server:
  - cd OGN/dist # go to where the utilities are
  - ./VALI-AVX.xxxyyy igcfile # where xxx is the opsys and yyy is the arch
  - # it is an option as well in Windows10 (WIN)

More details at:

- https://github.com/acasadoalonso/OGN-IGC-Trackers-setup