Setup RaspPi Heidi Server

- download / install RaspPi Imager from https://www.raspberrypi.org/software/
- `> rpi-imager` choose recommended image
- plug in SD card toRaspPi, login (user pi, passwd raspberry / raspberrz on german keyboards) startup, step through setup (no WiFi)
- resize root partition on SD-card to 16GiB (e.g. use gparted on a other system)
- backup and clean /opt
- create a separated fs mounted to /opt (best a separated device, a partition should do too)
- remove auto-login: edit `/etc/lightdm/lightdm.conf` comment out line `autologin-user...`
- enable ssh for remote sessions:
  ```
  > sudo systemctl enable ssh
  ```

- install php, apache, mysql (mariadb)
  ```
  > sudo apt install apache2 php mariadb-server mariadb-client
  > sudo systemctl enable mysql (ignore „too many symlinks“)
  > sudo mysql_secure_installation (set new root pw/ all other „Y“)
  > sudo mysql -u root
  MariaDB [mysql]> USE mysql;
  MariaDB [mysql]> UPDATE user SET plugin='mysql_native_password' WHERE
  User='root';
  MariaDB [mysql]> FLUSH PRIVILEGES;
  MariaDB [mysql]> exit;
  ```

- change store-location for mysql:
  ```
  > sudo systemctl stop mariadb.service
  > sudo mkdir /opt/heidi
  > sudo mv /var/lib/mysql /opt/heidi/.
  > sudo chown -R mysql /opt/heidi/mysql
  > sudo chgrp -R mysql /opt/heidi/mysql
  > sudo nano /etc/mysql/mariadb.conf.d/50-server.cnf
    -> datadir = /opt/heidi/mysql
  > sudo systemctl start mariadb.service
  ```

- `> sudo apt install phpmyadmin`, choose option apache2, do not reinstall database
- open phpmyadmin website and login with mariadb root login, phpmyadmin will request you to create basic structures
- new database: name „Heidi“ Kollation: utf8_general_ci
- new user: name „HeidiTracker“, localhost, INSERT / UPDATE / SELECT only on database „Heidi“
- create administrative user besides root with less privileges
- new Table „TrackerData“ InnoDB with 12 Columns:
  ```
  TrackerID    VARCHAR  9
  Longitude    DECIMAL  9,6
  Latitude     DECIMAL  9,6
  Altitude     DECIMAL  9,6
  TimeStamp    DATETIME
  Battery      DECIMAL  3,2  NULL
  Temperature  DECIMAL  4,2  NULL
  FreeValue1   VARCHAR  16   NULL
  FreeValue2   VARCHAR  16   NULL
  FreeValue3   VARCHAR  16   NULL
  FreeValue4   VARCHAR  16   NULL
  FreeValue5   VARCHAR  16   NULL
  ```

- new Table „Fence“ InnoDB with 4 Columns:
  ```
  HerdeID      VARCHAR  4
  Longitude    DECIMAL  9,6
  Latitude     DECIMAL  9,6
  Active       TINYINT             Default: 0
  ```

- configure apache2 for web-frontend
  /etc/apache2/ports.conf: add ports for http and https / tls (I'm using 1080 for http and 1083 for https you may use other ports)

```
>sudo nano /etc/apache2/apache2.conf
```
(additionally to similar blocks) add:
```
<Directory /opt/heidi/web/>
       Options Indexes FollowSymLinks
        AllowOverride None
        Require all granted
</Directory>

>sudo nano /etc/apache2/sites-available/heidi.conf
<VirtualHost *:1080>
   ServerAdmin root@localhost
   DocumentRoot /opt/heidi/web
   ErrorLog ${APACHE_LOG_DIR}/error.log
   CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>

> sudo nano /etc/apache2/sites-available/heidi-ssl.conf
  <IfModule mod_ssl.c>
      <VirtualHost *:1083>
          ServerAdmin root@localhost
          DocumentRoot /opt/heidi/web

          ErrorLog ${APACHE_LOG_DIR}/error.log
          CustomLog ${APACHE_LOG_DIR}/access.log combined

          SSLEngine on
          SSLCertificateFile      /etc/ssl/certs/ssl-cert-snakeoil.pem
          SSLCertificateKeyFile /etc/ssl/private/ssl-cert-snakeoil.key

          <FilesMatch "\.(cgi|shtml|phtml|php)$">
                          SSLOptions +StdEnvVars
          </FilesMatch>
          <Directory /usr/lib/cgi-bin>
                          SSLOptions +StdEnvVars
          </Directory>

      </VirtualHost>
  </IfModule>
```
(copy details from default-ssl.conf)

```
> sudo a2ensite heidi.conf
> sudo a2ensite heidi-ssl.conf
> sudo a2enmod ssl
> sudo systemctl restart apache2.service
```

- you may need to manually upgrade phpmyadmin, following: https://devanswers.co/manually-upgrade-phpmyadmin/

- Web-contend: upload all files from repository to /opt/heidi/web, enter /opt/heidi/web
```
> wget https://github.com/openlayers/ol2/releases/download/release-2.13.1/
OpenLayers-2.13.1.tar.gz
> tar -xvzf OpenLayers-2.13.1.tar.gz
> mv OpenLayers-2.13.1 ol
> rm OpenLayers-2.13.1.tar.gz
```

- Configure your network according to the settings made here. If you not intend to use a commercial web-service, which maybe not a bad idea, you may use a fritz box DSL router because AVM provides a static URL for each device.

- that's it