

# Welcome to the Wirnet Station SPN wiki

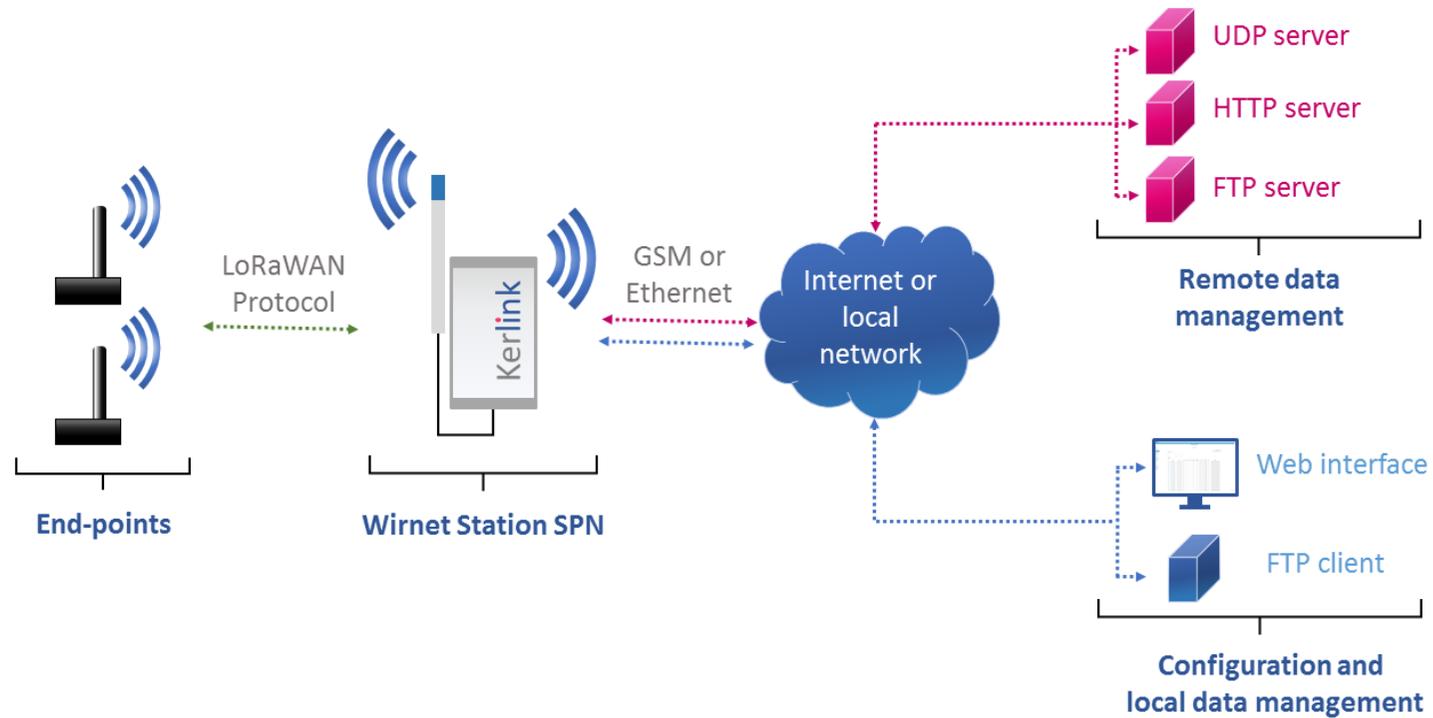
## What is SPN ?

The SPN (Small Private Network) station is a data collector over a LoRa network. The classical communication case is that an end-device (also called mote or end-point) belonging to the LoRa network emits a frame and opens short reception windows after the end of emission.

## What can you do with SPN ?

The SPN station is connected to an IP network in order to:

- Get transmission data and statistics of the LoRa network
- Configure the LoRa network and manage motes fleet
- Configure and administrate the station



**Configuration and local data management** allows to configure and use end-points on the gateway.

The following features available are:

- **SPN Web interface:** to show transmitted data from motes to the SPN station.
- **FTP server:** Getting logs and configuration files from the FTP.

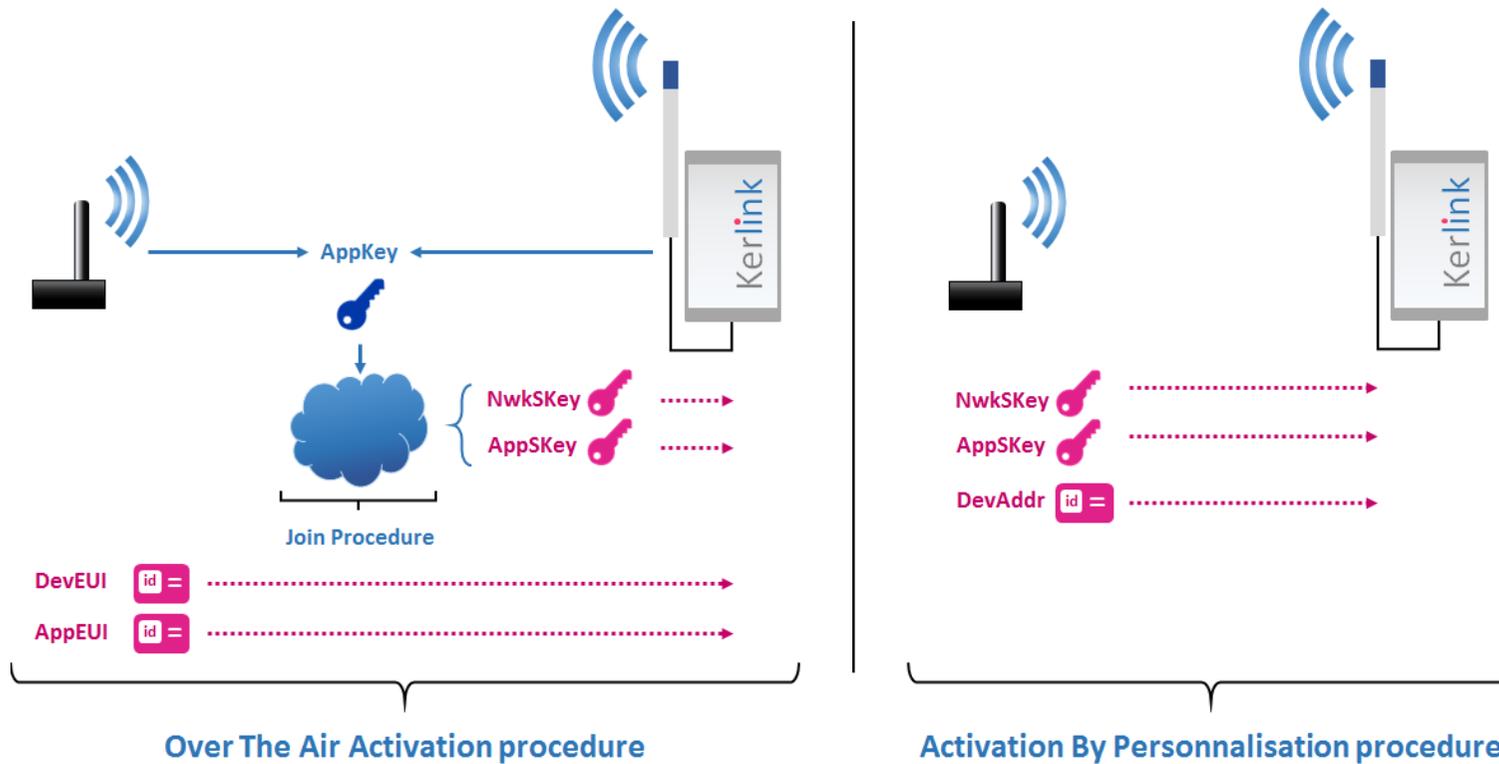
**Remote data management** is a solution which allows to use specific features such as:

- **HTTP(s) transmitter :** send data using ReST.

- **UDP transmitter** : send data on JSON files using UDP .
- **FTP transmitter** : plan data sending to motes.

End-points fleet then can be monitored on the SPN web interface to show transmitted data from motes to the SPN station. FTP server is useful to retrieve logs and JSON configuration file.

## LoRaWAN protocol



LoRaWAN uses a symmetric encryption scheme between end-points and the operating server. Each mote has a secret key (app\_key) which is used to derive two session keys (the network session key nwk\_skey and the application session key app\_skey).

The end-point activation can be done via

1. **Over The Air Activation** (OTAA) using the join procedure :

- dev\_eui related to device EUI
- app\_eui related to application EUI
- app\_key related to application key

2. **Activation By Personalisation** (ABP) connecting directly :

- dev\_addr related to device address
- nwk\_skey related to network session key
- app\_skey related to application session key

## Note - LoRaWAN Protocol

- **Activation procedure - keys:** Depending on the end-point activation procedure mode, the operating server must know the app\_key (OTAA) or the session keys nwk\_skey/app\_skey (ABP).
- **Motes - LoRaWAN compliancy:** The LoRaWAN server discards frames coming from motes that are not registered with the relevant data above-mentioned.
- **Motes - Activation procedure:** As the activation procedure may vary from one mote reference to another one, the station handles both of them.
- **Mote field - DevAddr:** A device ID of 32 bits that uniquely identifies the end-point. The DevAddr must be unique in the network where the device operates. Its format is as follows: