Architecture of system

mobile

web

........

.......

GW

.........

node

node

.........

node

MongoDB

service

GW

Node

Web service

web service

Node to GW

Lora 868

GW

node

GW to Server

GW

service

Wifi / 3g/4g

MongoDB

When node send message , maybe there are more 1 GW that receive it, so service will identify “node in GW”,

And result is true , service will do with message and save it to MongoDB, if else service will ignore it.

Web to Server

Web

service

Web / mobile

Wifi / 3g /4g

Mongo DB

Web app will manage nodes, GWs, nodes in GW, users, data from node. (add, delete, edit, view, search, login, logout)

Mobile will just do login, logout, view, search data.

Power for Node

Just use pin

Power for GW

Support power for GW by jack 5.5 x 2.5 , used for both DC and AC ( electric / solar )

GW is in a box, power solar pin is in another box and connect to GW by power cable.

Data = latt;long;sensor;value;.....;......;battery;

Sensor = temperature, humidity, salinity, ........

Value = style of sensor : temperature,humidity,.....

Cặp sensor;value sẽ lặp lại theo số lượng sensor trên 1 node

Battery = remain of power in battery

Vẽ chart thì giải mã Data , lấy giá trị và sensor rồi vẽ

Message structure for GW

JSON up: {"stat":{"time":"2018-08-02 04:20:35 GMT","lati":0.00000,"long":0.00000,"alti":0,"rxnb":0,"rxok":0,"rxfw":0,"ackr":0.0,"dwnb":0,"txnb":0},”style”:0,”name”:...}

Style = 0 : identify GW

GW handle 1000 nodes, node send message with 25minute /once

GW receive a message with 90s / once, and send it to server

GW send its location (GPS) to server with 25 minute/ once

GW consist a file (server\_info.txt) include IP:port or website url.

Web to Node

Wifi / 3g /4g

Web service

web

Wifi / 3g /4g

GW

mongoDB

Lora 868

node

Web app will do some of changes with node as change time of sending data.

**Request of firmware**

Node consist a file (info.txt) include App\_key, eui\_key, app\_eui , distance time for sending data, .......

Each of field is a line in file.

GW consist a file (server\_info.txt) include IP:port or website url.

node create string (a;b;c;d) , put it into payload\_creatext , and then create JSON with fields from Objenious , and do encode AES125 for JSON , and this is content of data in frame 2.

Node send frame 2 to Objenious , Objenious will do decode AES125 for frame 2 (LORAWAN packet decode ), and get JSON . After that , convert HEX to ASCII for payload\_creatext to get string (a;b;c;d) . This string is information from sensor on node

{"id":"uplink-26-79c1","device\_id":562949953429196,"group\_id":688,"group":"dfm","profile\_id":645,"profile":"dfm-test-geo5","type":"uplink","timestamp":"2018-04-19T14:07:49.638Z","count":26,"payload\_encrypted":"581bb0dcbe2980ffafdcc18f2829d352bf4e74efb3a7f2876ee699647de1265864d0ab888c66ee7b2af5db4e464ea1","payload\_cleartext":"34362e373839383834343b302e313638373931353b3134312e363030303036313b342e31343b313b32323b363b303b","device\_properties":{"appeui":"47454f3131323137","deveui":"47454f3030303037","external\_id":""},"protocol\_data":{"AppNonce":"0a84f2","DevAddr":"0e341176","DevNonce":"79c1","NetID":"000007","best\_gateway\_id":"M60108","gateways":3,"lora\_version":0,"noise":-115.63892034143,"port":1,"rssi":-115,"sf":12,"signal":-123.63892034143,"snr":-8},"lat":46.710009449227,"lng":0.01843728180233,"geolocation\_type":"network","geolocation\_precision":1500,"zone\_id":85,"city\_code":"86073","city\_name":"Cherves","delivered\_at":null}

{"id":"uplink-0-5379","device\_id":562949953429558,"group\_id":688,"group":"dfm","profile\_id":645,"profile":"dfm-test-geo5","type":"uplink","timestamp":"2018-08-29T07:20:37.554Z","payload\_encrypted":"61e98b3c7c97d4af27592e10653d81581f843a4ed7","payload\_cleartext":"302e303b302e303b303b333b342e3735373038303b","device\_properties":{"appeui":"47454f3131323137","deveui":"47454f3030303036","external\_id":""},"protocol\_data":{"AppNonce":"d0682e","DevAddr":"0f680bf7","DevNonce":"5379","NetID":"000007","best\_gateway\_id":"M60260","gateways":3,"lora\_version":0,"noise":-111.12442602794,"port":1,"rssi":-107,"sf":12,"signal":-109.12442602794,"snr":2},"lat":46.665499589511,"lng":0.37376621088617,"geolocation\_type":"network","geolocation\_precision":1500,"zone\_id":85,"city\_code":"86062","city\_name":"Chasseneuil-du-Poitou","delivered\_at":null}