



Bohunt School (Wokingham)

Plane Spotting with Node-RED



This simple tutorial should be a lot of fun as it involves 'plane spotting' from the comfort of sitting in front of your personal computer, tablet or laptop.



You should be able to complete the basic part of the tutorial in about 15mins. No hardware is needed apart from the following nodes.

Nodes required

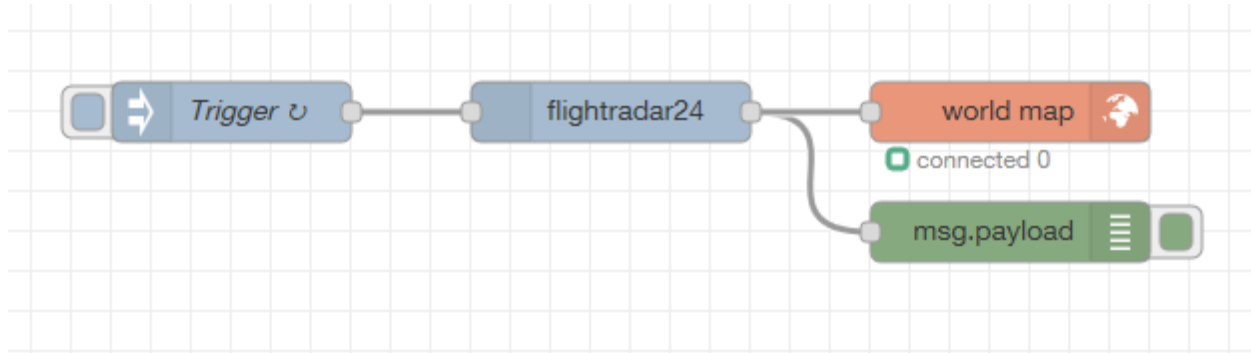
- Inject, Delay and Function nodes
- Node-red-dashboard: ui_button and ui_template
- Node-red-contrib-flightradar24: flightradar24
- Node-red-contrib-web-worldmap: worldmap

You will probably have to install the last two nodes as well as the dashboard.

Please contact Mr D if you have problems finding or installing these nodes.

Node-RED flow (Plane-Spotting basic)

Using the following screen-shot as a guide create this Node-RED flow.

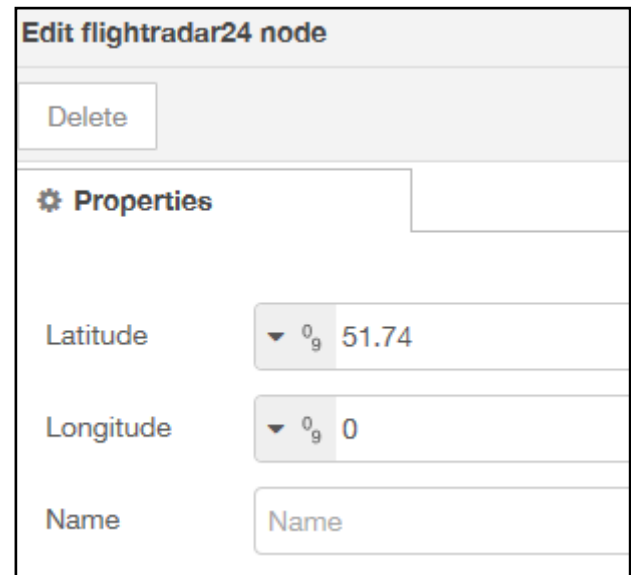


The ‘inject’ node (labelled trigger) is set to trigger every second.

Enter suitable latitude and longitude values into the ‘flightradar24’ node to define the geographical location where ‘flightradar24’ is to operate.

This example is using the Lat and Lon for London Heathrow (LHR), UK.

Flightradar24 will find the details for all the aircraft within a 100 km radius of your chosen geographical location.



Edit flightradar24 node

Delete

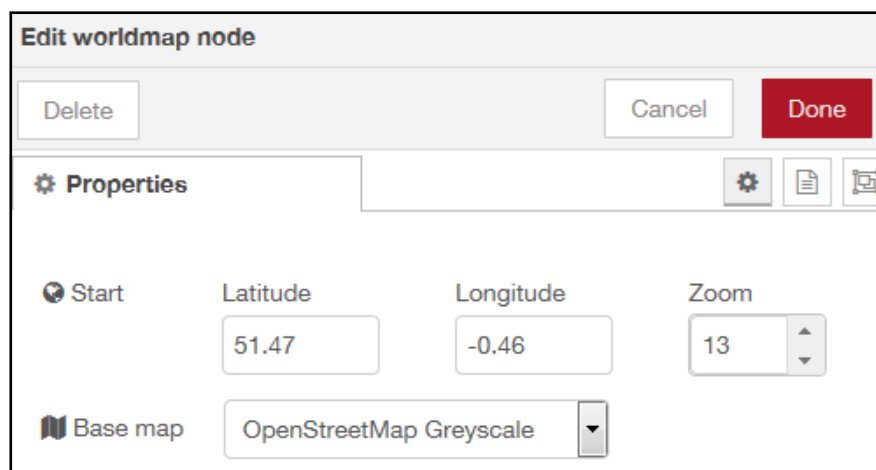
Properties

Latitude

Longitude

Name

The next step is to setup the ‘worldmap’. Again the Lat and Lon values for



Edit worldmap node

Delete Cancel Done

Properties

Start Latitude Longitude Zoom

51.47 -0.46 13

Base map OpenStreetMap Greyscale

London Heathrow have been used with a zoom factor of 13 (to give a nice view of the airport and the surrounding area).

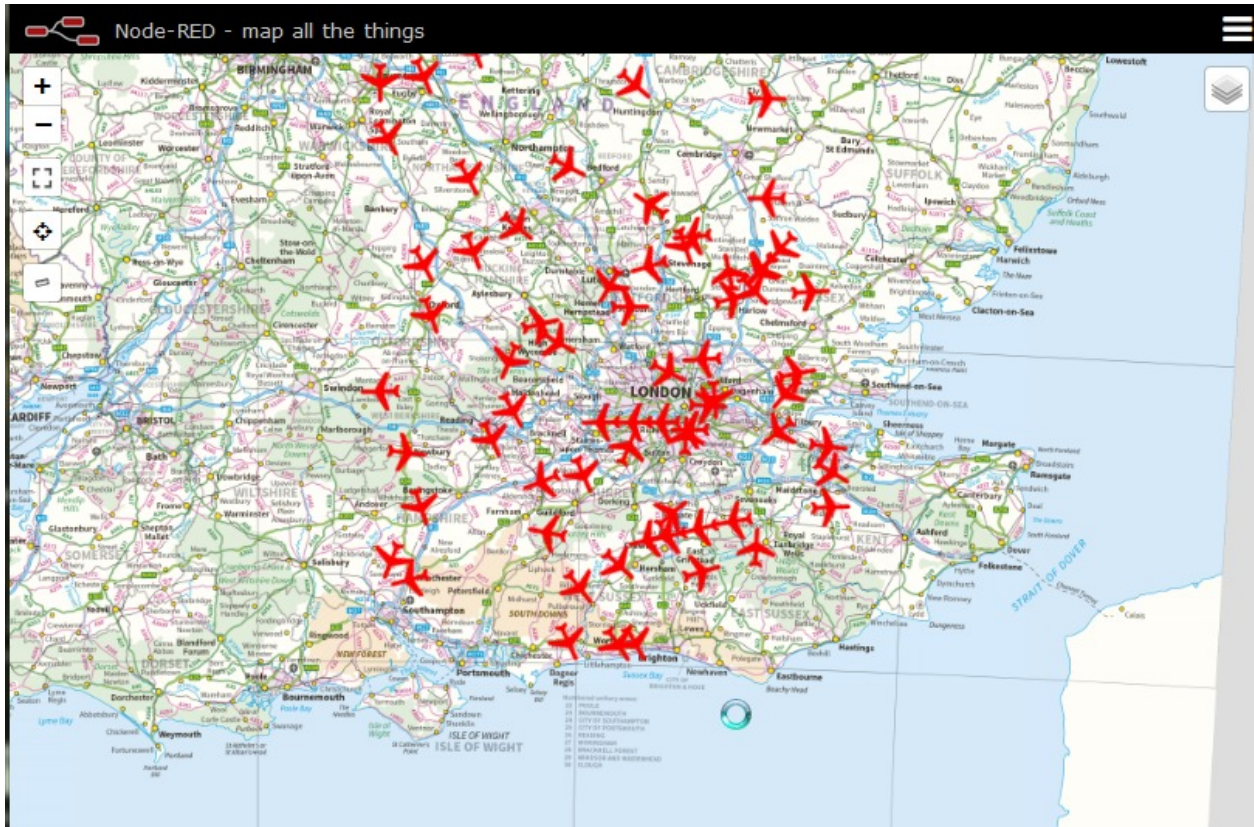


Worldmap

The default location where you can find 'worldmap' is:

http://<your_raspberry_pi_server_address>:1880/worldmap

For example: <http://192.168.1.138:1880/worldmap>



This image shows the aircraft within a 100Km radius of London, Greenwich. You can zoom in/out of this location and move the map left or right.

Here's a view of some aircraft about to land at London Heathrow (LHR).



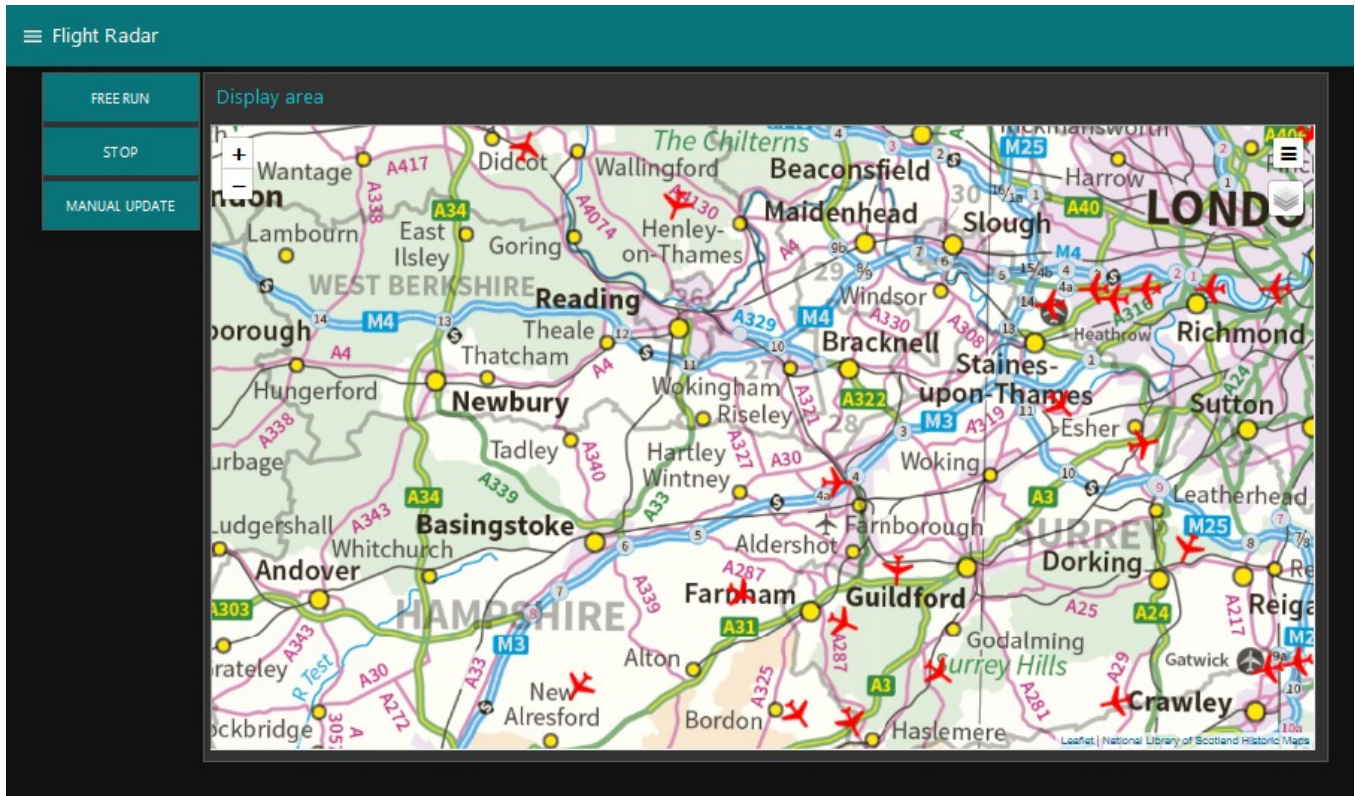
Does your screen look like this one?

Ask Mr D if you need any help.



Node-RED flow (Plane-Spotting advanced)

Here's a screen-shot of the dashboard for our advanced plane spotting project.



Three ui_buttons (labelled 'Freerun', 'STOP' and 'Manual Update') have been added to the dashboard. I think the function of the buttons is self-explanatory except for 'Manual Update' which updates the position of the aircraft (shown by the small red icons) when the system is in 'STOP' mode.

When the system is in 'STOP' mode you can click on an aircraft icon to find out it's flight details.

Here's an example for flight E1380.

Its origin is SNN (Shannon in the Irish Republic)

Its destination is LHR (London, Heathrow)

Aircraft type or model is Airbus A320

You can also see its altitude, latitude and longitude as well as the timestamp.



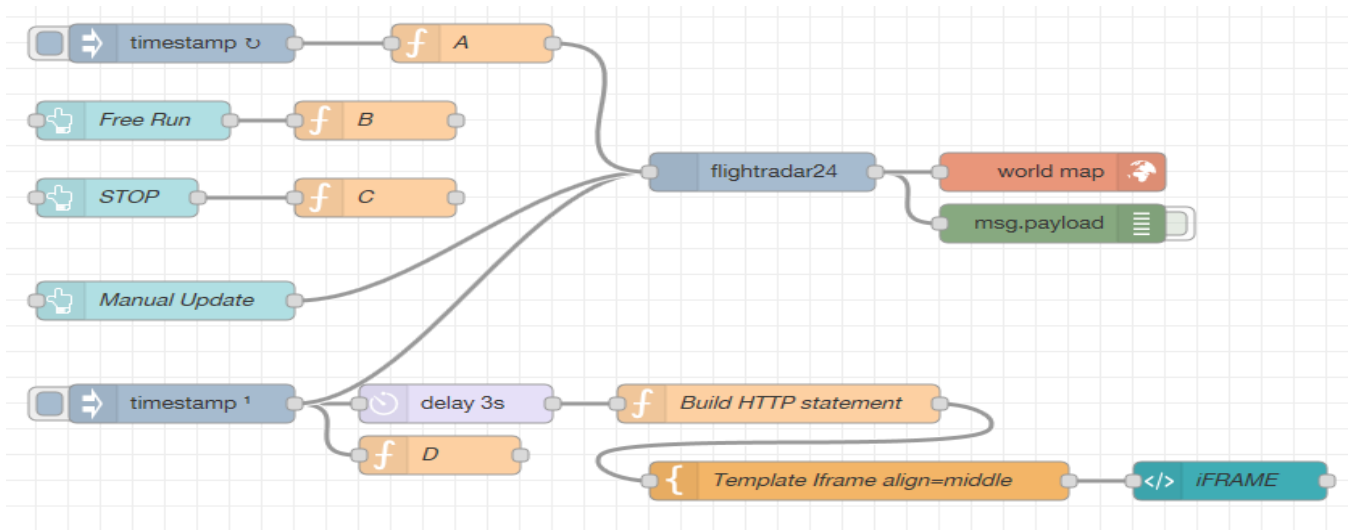
Plane Spotting with Node-RED

iFrame

The main area on the dashboard is an iFrame. An iFrame is one or more areas within a web page that can be used to show information from another source. In this part of the project the output from the 'worlmap' node has been targeted or sent to the iFrame.

Node-RED flow

Using this screen shot as a guide create this Node-RED flow.

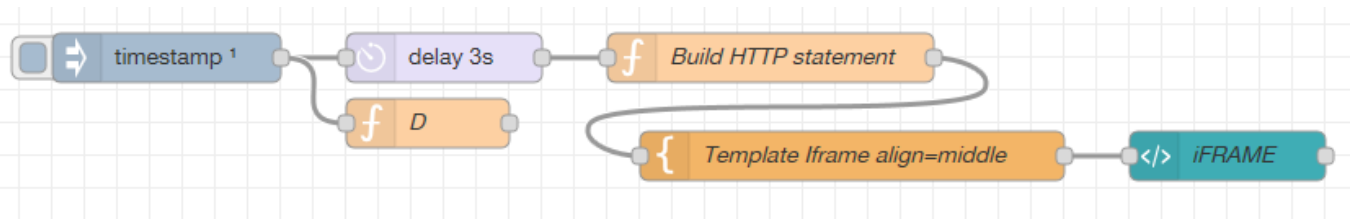


Although the flow might look a bit complicated at first sight - it isn't.

Let's break it down into simple parts.

The first objective is to display the various aircraft in a separate iFrame.

Here's the piece of code to handle that task.



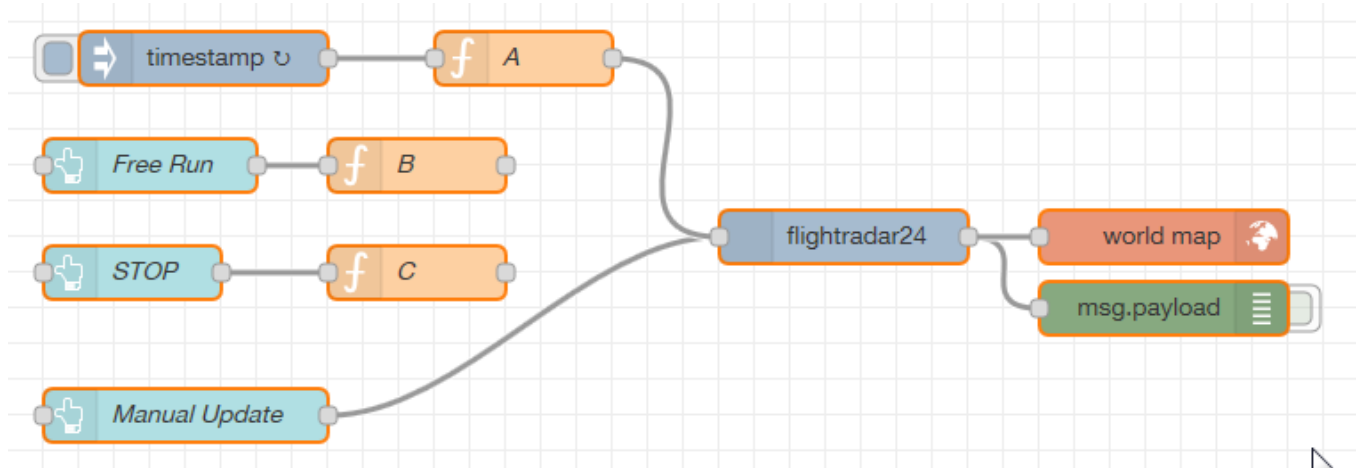
The 'inject' node on the left is triggered once when the flow starts. Inside the D node a flow-variable named "status" is set to the value "stopped".

A delay node is also triggered and after a 3-second delay the 'Build HTTP statement' and Template nodes are used to setup the web address for the web page that will be sent to the ui_template labelled 'iFrame'.

Details of the contents of these nodes can be found in this [linked file](#).



Here's the flow to handle the three ui_buttons.



The 'inject' node on the left will trigger every 2-seconds. This is used to control how often the system updates the position of the various aircraft. If you want to this value can be changed to slow-down the update frequency.

The A node checks the value of the flow variable named "status". If it has the value "run" then the trigger is passed on to the 'flightradar24' node which will get details of all the aircraft flying in the vicinity and send this information to 'worldmap' (which has been directed to the iFrame).

If the value of "status" is "stopped" then the trigger is not passed-on.

The two buttons labelled 'Free Run' and 'STOP' are used to change the value of the flow variable called "status" inside the B and C nodes.

```
flow.set("status","run");           // Free Run ui_button  
flow.set("status","stopped");       // STOP ui_button
```

The 'Manual Update' button is used to trigger the 'flightradar24' node. If you wanted to be really clever you could insert a 'function' node in this path to check if "status" was "stopped" and only pass on the trigger in this case.

Node-RED flow

If you get stuck you can visit this [hyperlink](#) and import the json formatted file.

Please see Mr D if you are unsure how to Import a json file into Node-RED.

Congratulations on becoming a Plane Spotter with Node-RED