How to Encode, Send and Receive JSON Data Using the Python MQTT Client

Hi, Steve here from Steve's internet guide.

In this video we're going to look at how you send and receive JSON data using the

Python MQTT client. Now, what is JSON?

Well, the wiki definition is the JSON which stands for JavaScript object

notation is a file format that uses text

to transmit data objects consisting of

attribute value pairs or key value pairs

and jason has become a very common way

of packaging data for sending between

systems and it's important to realize

that Jason isn't restricted to

JavaScript you started life in

JavaScript but it's not restricted to

JavaScript because it's actually a file

format and that we're gonna be using

Python in this video along with MQTT and

we're going to be transmitting data

between a Python clients and a mosquito

broker or an mqt broker in JSON format

now the reason it's become so popular is

because it's it's very very easy to take

an object in one line in a language and

in a program and transmit it to another

system and read it back into the program

as a data object and what we're going to

be doing here is we're going to be

taking a dictionary and this is the

dictionary here and we're gonna take the

dictionary we're then going to encode

the dictionary as a JSON string and this

is the command the Python command we're

going to use to do it then we're going

to send it across the network using MQTT

and at the receiver we're going to

decode the string and this is again the

command we used to do it here very

simple and this decodes is straight back

into a dictionary so there we're

finishing with our dictionary here on on

the other system created a demo script

and we're going to actually look at this

the way it works in in real life ok this

is our script and what we're going to be

doing is we're going to be transmitting

this dictionary here across the network

we're going to send it to the broker and

we can receive it back again we import

JSON to use it and we import the

mqtt clients script consists of two

parts the first part we basically do

that internally we do we recreate a JSON

object and we decode the json object we

don't send it anywhere we just do it on

the on the computer and then the second

part of it we actually do the same thing

but this time we send it across the

network and we receive it back from the

the network and we put it back into a

dictionary and we've got lots of print

statements here that tells you the the

progress so print the dictionary this so

it just gives you the dictionary and

we're gonna say what type it is we

should say it's a dictionary and then

we're just gonna print part of the

dictionary broker address one which is

this address here and then we're going

to convert it this is the important bit

now we're gonna convert it to JSON

format that we're gonna print out the

type so we should see there it's a

string and then we're going to print out

the data so we should see what it looks

like and then we're going to go back on

the receive side and we're just going to

make data in equal to data out just

simulate we've sent it and then we're

gonna do the same thing we're going to

print out the type we're gonna print out

the data and then here we convert the

data from JSON back into an object and

it goes straight into a dictionary

Brokers in and then we're going to print

out the type so we should see again it's

a dictionary and then we're going to

print out the address of one of the

elements in that dictionary just like we

would do in a standard dictionary and

then we're going to pause and to go into

the next part of the script and the next

part of the script is basically the same

thing it converts the the dictionary

into a JSON string and as we've already

done that we don't need to repeat it

we're just going to take the the data

out there and we're going to send it

using MQTT so you

we go further down here you can see we

connect to the broker and we publish the

data out this is already json encoded

because we encoded it earlier on and

then we've actually subscribed to the

topic that we're publishing on so

there's a subscribe there so we should

receive it and there's our own message

callback that takes the message and you

can see here we're decoding it

converting it from JSON straight into a

dictionary and again we're going to

print out the time so we should see we

received a dictionary and we're gonna

get print out the broker to address

which is that one there just to prove

that we've got a dictionary back so

let's run the script and see what

happens okay that one very quick there's

a dictionary printed out their

dictionary no broker out is the

dictionary printed out the elements

first element which is that one there we

converted it to JSON and now we've got a

string now this is what the data route

looks like it looks very similar to the

dictionary and there we go onto the

receiving side receive it we've got a

string the JSON comes in as a string we

convert it into a dictionary using the

JSON command and you can see here when

we print out it brokers in is a

dictionary and again we print out one of

the elements broker to address now we're

ready to continue this time we're going

to do what we're going to do is actually

send the data to the broker and we're

going to receive the data back so let's

run it okay we connect to the broker

then we send our data and no will

received our data and it's actually as a

string and you can see what it looks

like here there's the data received

now we convert it from Jason to the

object and what type of object is it

well it's a dictionary and we print out

the elements broker to address there now

you may have noticed that there's some

extra print statements in here I did

actually go back and modify the the

script because there weren't enough

print statements in there

to record the progress of the sent and

receive messages so I just went back and

I put them in here for a few more print

statements and yeah now the script is

actually on is on the downloads page so

if you want to use this script you more

than welcome to do so you can get it

from the downloads page and there'll be

a link below the video ok so that's how

to send and receive JSON data using the

Python MQTT client just to finish off is

a resource that you might find useful if

you want to learn more about Jason it's

the w3 schools tutorial introduction to

Jason and here is the URL here now if

you like the video then use the live

button below if you've got any comments

on the video then use the comment button

below and if you'd like to receive

notification of new videos then you can

subscribe to the channel if you go to

the website I do publish an occasional

newsletter which you may be interested

in signing up for and the forum is over

on the on the website ok that's the end

of this video until next time time