ST: Python Software Engineer (Embedded, Data Science)

Objectives

This task should take about 1-3 hours to complete.

We're looking for clear coding style and a demonstration of design principles such as OO, Functional, Generic and other structured approaches to implementation.

We're also looking at how you use the available tools and ecosystem to minimise the effort required to deliver a high quality solution. Note that we're not expecting this to be production ready necessarily, but want so see that a transition to production is possible given code comments and other recommendations.

Please ask for clarification if any of the requirements are unclear.

Task

An application with the following:

1. Write a random number generator in python that publishes a random number between 1 and 100 to an MQTT topic in a message broker on a random interval between 1 and 30 seconds. Recommend to use the paho MQTT python client library. http://www.eclipse.org/paho /clients/python/
2. Stand up a simple MQTT message broker. Recommend mosquitto or RabbitMQ. https://mosquitto.org/ https://www.rabbitmq.com/
3. A second python application that subscribes to the above message, reads the random number from the broker, and calculates one minute, 5 minute, and 30 minutes averages. These should then be sent back to the broker on a different topic.
4. A third python application that subscribes to the statistics calculated in point 3, and prints these out in a pretty tabular layout (on the console is fine).

Nice To Have

1. Environment to be configured with Ansible, including infrastructure and application deployment.
2. Use docker to deploy the message broker.
3. Entire system to be published in github or bitbucket.
4. Application running on AWS Free Tier server. Please provide access to below public key and advise Public IP of VM on which the application is deployed.

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDPfgfJipKrVSQhphIdyzNDXSwZyRGlD5Azuc5Z6ERSQE5OhL+Itgv94SU04vpo /YIejo+MQjOrxI1kCPnveVrFYVOlm5gxEDQwaZVvANzRKM/hMM0KbEVQbZZXb5wlIIvSl9lqmKwv06LJqQitAOXnwhC1rqC1olFShoAHdCcwt3qi /uPAh/xqYD6KZfv6qEsQTiE/r18pU403LmyT1KDMuOGVetNT8N8mLnO1K+sDQX9ES2KlzrJkFAWhR/dmZoAgKTjXhwuYybJ5m4FuIRYZLCa2 /BMQ1QLBFei+zWBPKWeouOaIXEVclAzxArQ8SXtI1Z5EDL3uqOykDQIC63HbUeFKeIYRaRKDiNIJ5+4SqVI5WiczdWetTmhc5WzdkZ2pnfjlGkG CCze9d88IrHpgifQQ0Jiwk5tPelWA2laWn8v4UqeFMRfZSF7UprSj2W81TfbpwyIxL0wWJAe4dtqpsm4d0RkPhygYD4xoCwcsDFZqjzsUHknYaywu ONJhpIU= andre@DESKTOP-07DM90B