Build a BASH runtime

Background

Apache Pulsar provides Pulsar Functions and allows user to run custom code in a serverless way. But Pulsar functions only support limited of programming language, like Java, Python and Golang.

This task requires you have some background knowledge on the following aspects:

- Apache Pulsar and Pulsar Functions
- Run Apache Pulsar in standalone mode or in K8S
- Kubernetes and Docker
- Serverless

Below are some useful links for you to understand.

Set up a standalone Pulsar locally · Apache Pulsar

Pulsar Overview · Apache Pulsar

Pulsar Functions overview · Apache Pulsar

function-mesh/images at master · streamnative/function-mesh

https://kubernetes.io/docs/

https://kind.sigs.k8s.io/

https://docs.docker.com/

Objectives

In this short task, you will need to complete some BASH scripts that take the first parameter from `/dev/stdin` as input message and output to `/dev/stdout`

. Then your task is to build a BASH runtime, which can be run and deployed to Linux, the BASH runtime needs to consume messages from one Pulsar topic, call the BASH script, and pass the output to another Pulsar topic.

The BASH runtime should directly create the producer and the consumer to Pulsar, and no need to interact with Pulsar Functions Worker, and you do not need to support `pulsar-admin functions` commands for the BASH runtime.

We encougrage the candicate using **Java** or **Golang** to complete this task, since these two programming languages are the most common languages we used for daily development. If you insist on using other language, please let the HR aware first, and start the task once the HR confirms. There is only one limitation on programming language, which is the BASH scripts must complete as `.sh` file and can be execute with `/bin/bash`.

The interview task should complete in **one week**, and please provide the Github repo (From Goal 5) to HR when you complete it or the time exceed.

Goals

- **Goal 1**: Define serval BASH scripts as functions, which consumes String messages
    - Please pick one of the following functions, and complete it in BASH script:
        - ☐ Exclamation Function: add "!" to the end of the input message
        - ☐ Reverse Function: reverses the input message
        - ☐ Word Count Function: output the number of words of the input message
- **Goal 2**: Build a BASH runtime
    - The runtime should be able to customize the input and output Pulsar topic
    - The runtime should be able to build Pulsar consumer and producer to stream the messages from and to Pulsar topics
    - The runtime should be able to invoke the target BASH script
    - **BONUS**: Be able to run multiple instances to support parallel processing
    - **BONUS**: Log Topic support

- **Goal 3**: Build function as image
  - Build your runtime with each BASH script as a complete docker image
  - Publish to Docker Hub
  - Provide a StatefulSet YAML file to run the function image in K8S, you can check the Kubernetes docs as reference.
  - **BONUS**: provide runner image to allow user build their own function image
- **Goal 4**: Documentation (English or Chinese)
  - A half page document describing the technical solutions to address how you solve the above tasks
  - Any goal you are not finished yet
  - Advices and suggestions about this interview task
  - **BONUS**: All in English
- **Goal 5**: Project Package
  - Create a Github Repo and push all code and document
  - Create a README and show how to use the runtime, and how your project is structured.
  - **BONUS**: Available tests and samples