

Homework 2 Report

Answers to Step 6 Questions

1. Command used to invoke the slack request function is “faas-cli” and “curl”
 - a. Via “curl”: **“curl http://127.0.0.1:<routing-port-number-8080-by-default>/function/slack-request”**
 - b. Via “faas-cli”: **“faas-cli invoke slack-request”**
2. The output of the slack-request function is a JSON object which is returned on invoking the function. Screenshots are provided on page 7.
3. The command to invoke slack-interactive function is using “faas-cli” or “curl” as given below
 - a. Via “curl”: **“curl http://127.0.0.1:<routing-port-number-8080-by-default>/function/slack-interactive”**
 - b. Via “faas-cli”: **“faas-cli invoke slack-interactive”**
4. The output of the slack-interactive function is a JSON object, returned upon invoking the function with a JSON object input. Screenshots are provided on page 6.
5. Passing arguments to the function could be done either
 - a. Via STDIN: **“curl http://127.0.0.1:8080/function/<function> -d <data string>”**
 - b. Via echo: **“echo <JSON string> | faas-cli invoke <function>”**
6. The way to change the slack-interactive function to respond to various inputs is by taking in the request string and decoding it into a JSON object. The final key-value pairs could be added to the JSON object and returned back in the response body.

Another way of doing this is by taking in ****kwargs** (list of arguments, similar to command-line arguments) in the python handle function (specific to python).

Answers to Step 7 Tasks:

- Screenshot of invoking the Figlet function

Invoked using the command-line interface, since I was running the ubuntu live server in a VM.

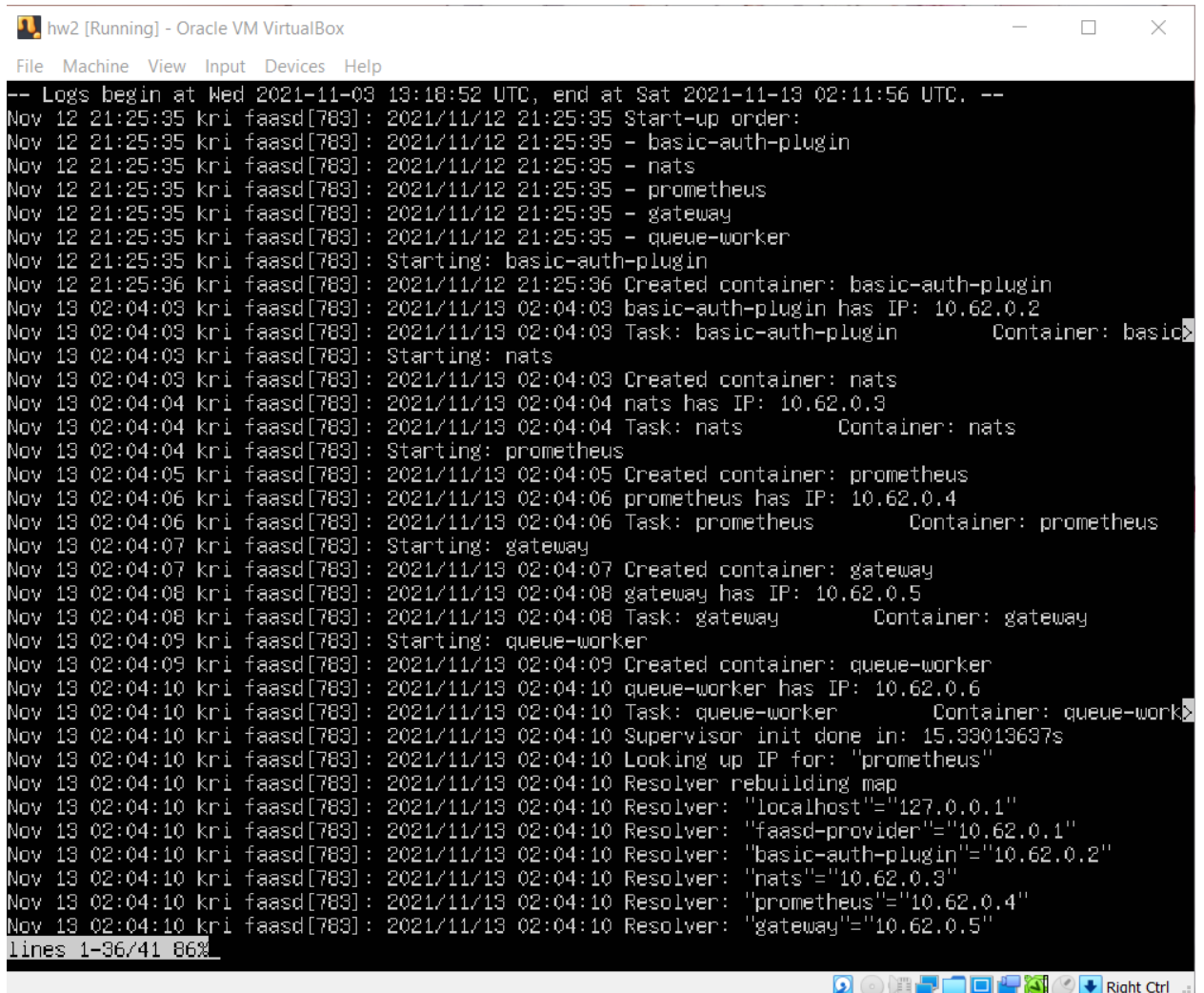
```
root@kri:~# echo "Hello, World!" | faas-cli invoke figlet
[ASCII art of "Hello, World!"]
root@kri:~# faas-cli invoke figlet
Reading from STDIN - hit (Control + D) to stop.
Hello World!
[ASCII art of "Hello, World!"]
root@kri:~#
```

Invoked using the UI provided at OpenFaas gateway on my host machine (port 3080 was VM 8080)

The screenshot shows the OpenFaas web interface. On the left is a sidebar with the OpenFaas logo, a 'Deploy New Function' button, and a search bar. Below the search bar, a list of functions is shown: 'figlet', 'slack-request', and 'slack-interactive'. The 'figlet' function is selected. The main panel displays details for the 'figlet' function, including its status (Ready), number of replicas (1), and invocation count (8). It also shows the image (ghcr.io/openfaas/figlet:latest) and the URL (http://127.0.0.1:3080/function/figlet). Below this, there is an 'Invoke function' section with an 'INVOKE' button and radio buttons for 'Text' (selected), 'JSON', and 'Download'. The request body is 'Hello, World!'. At the bottom, the response status is 200, the round-trip time is 0.149s, and the response body is the ASCII art of 'Hello, World!'.

- Screenshot of running journalctl of faasd (40 lines)

It is basically the shows us the journal entries of faasd tasks (the first 40 lines) that occurred from the start of faasd



The screenshot shows a terminal window titled "hw2 [Running] - Oracle VM VirtualBox". The terminal output displays journalctl logs for faasd tasks. The logs begin at Wednesday, 2021-11-03 13:18:52 UTC and end at Saturday, 2021-11-13 02:11:56 UTC. The logs show the start-up order of various components: basic-auth-plugin, nats, prometheus, gateway, and queue-worker. Each component is started, a container is created, and the task is executed. The logs also show the IP addresses assigned to each component: basic-auth-plugin (10.62.0.2), nats (10.62.0.3), prometheus (10.62.0.4), gateway (10.62.0.5), and queue-worker (10.62.0.6). The logs end with the supervisor initialization and the resolver rebuilding the map.

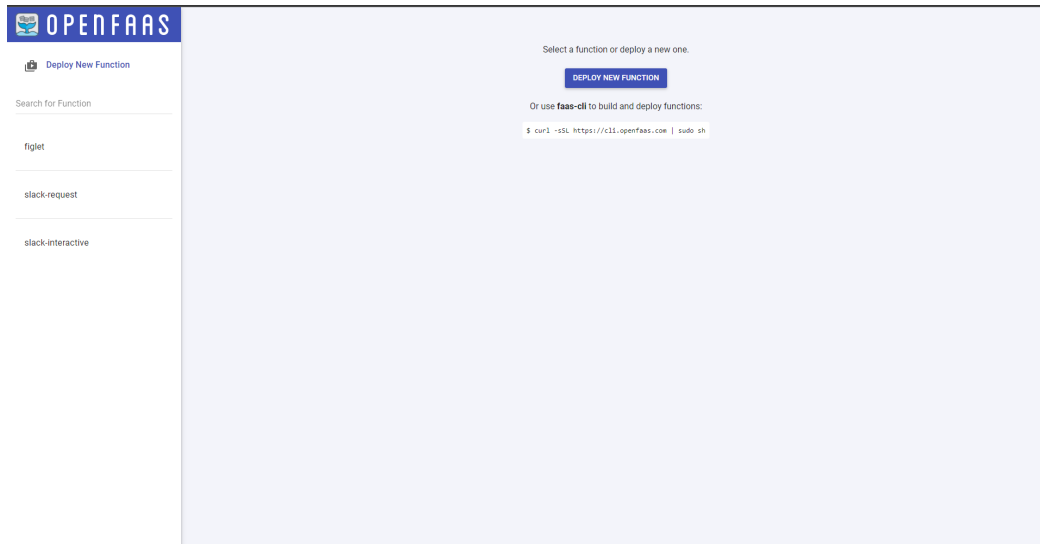
```
-- Logs begin at Wed 2021-11-03 13:18:52 UTC, end at Sat 2021-11-13 02:11:56 UTC. --
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 Start-up order:
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - basic-auth-plugin
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - nats
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - prometheus
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - gateway
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - queue-worker
Nov 12 21:25:35 kri faasd[783]: Starting: basic-auth-plugin
Nov 12 21:25:36 kri faasd[783]: 2021/11/12 21:25:36 Created container: basic-auth-plugin
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 basic-auth-plugin has IP: 10.62.0.2
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 Task: basic-auth-plugin Container: basic-auth-plugin
Nov 13 02:04:03 kri faasd[783]: Starting: nats
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 Created container: nats
Nov 13 02:04:04 kri faasd[783]: 2021/11/13 02:04:04 nats has IP: 10.62.0.3
Nov 13 02:04:04 kri faasd[783]: 2021/11/13 02:04:04 Task: nats Container: nats
Nov 13 02:04:04 kri faasd[783]: Starting: prometheus
Nov 13 02:04:05 kri faasd[783]: 2021/11/13 02:04:05 Created container: prometheus
Nov 13 02:04:06 kri faasd[783]: 2021/11/13 02:04:06 prometheus has IP: 10.62.0.4
Nov 13 02:04:06 kri faasd[783]: 2021/11/13 02:04:06 Task: prometheus Container: prometheus
Nov 13 02:04:07 kri faasd[783]: Starting: gateway
Nov 13 02:04:07 kri faasd[783]: 2021/11/13 02:04:07 Created container: gateway
Nov 13 02:04:08 kri faasd[783]: 2021/11/13 02:04:08 gateway has IP: 10.62.0.5
Nov 13 02:04:08 kri faasd[783]: 2021/11/13 02:04:08 Task: gateway Container: gateway
Nov 13 02:04:09 kri faasd[783]: Starting: queue-worker
Nov 13 02:04:09 kri faasd[783]: 2021/11/13 02:04:09 Created container: queue-worker
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 queue-worker has IP: 10.62.0.6
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Task: queue-worker Container: queue-worker
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Supervisor init done in: 15.33013637s
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Looking up IP for: "prometheus"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver rebuilding map
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "localhost"="127.0.0.1"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "faasd-provider"="10.62.0.1"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "basic-auth-plugin"="10.62.0.2"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "nats"="10.62.0.3"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "prometheus"="10.62.0.4"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "gateway"="10.62.0.5"
lines 1-36/41 86%
```

File Machine View Input Devices Help

```
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - gateway
Nov 12 21:25:35 kri faasd[783]: 2021/11/12 21:25:35 - queue-worker
Nov 12 21:25:35 kri faasd[783]: Starting: basic-auth-plugin
Nov 12 21:25:36 kri faasd[783]: 2021/11/12 21:25:36 Created container: basic-auth-plugin
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 basic-auth-plugin has IP: 10.62.0.2
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 Task: basic-auth-plugin Container: basic-auth-plugin
Nov 13 02:04:03 kri faasd[783]: Starting: nats
Nov 13 02:04:03 kri faasd[783]: 2021/11/13 02:04:03 Created container: nats
Nov 13 02:04:04 kri faasd[783]: 2021/11/13 02:04:04 nats has IP: 10.62.0.3
Nov 13 02:04:04 kri faasd[783]: 2021/11/13 02:04:04 Task: nats Container: nats
Nov 13 02:04:04 kri faasd[783]: Starting: prometheus
Nov 13 02:04:05 kri faasd[783]: 2021/11/13 02:04:05 Created container: prometheus
Nov 13 02:04:06 kri faasd[783]: 2021/11/13 02:04:06 prometheus has IP: 10.62.0.4
Nov 13 02:04:06 kri faasd[783]: 2021/11/13 02:04:06 Task: prometheus Container: prometheus
Nov 13 02:04:07 kri faasd[783]: Starting: gateway
Nov 13 02:04:07 kri faasd[783]: 2021/11/13 02:04:07 Created container: gateway
Nov 13 02:04:08 kri faasd[783]: 2021/11/13 02:04:08 gateway has IP: 10.62.0.5
Nov 13 02:04:08 kri faasd[783]: 2021/11/13 02:04:08 Task: gateway Container: gateway
Nov 13 02:04:09 kri faasd[783]: Starting: queue-worker
Nov 13 02:04:09 kri faasd[783]: 2021/11/13 02:04:09 Created container: queue-worker
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 queue-worker has IP: 10.62.0.6
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Task: queue-worker Container: queue-worker
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Supervisor init done in: 15.93019637s
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Looking up IP for: "prometheus"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver rebuilding map
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "localhost"="127.0.0.1"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "faasd-provider"="10.62.0.1"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "basic-auth-plugin"="10.62.0.2"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "nats"="10.62.0.3"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "prometheus"="10.62.0.4"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "gateway"="10.62.0.5"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Resolver: "queue-worker"="10.62.0.6"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 faasd: waiting for SIGTERM or SIGINT
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Looking up IP for: "gateway"
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Proxy from: 0.0.0.0:8080, to: gateway:8080 (10.62.0.5)
Nov 13 02:04:10 kri faasd[783]: 2021/11/13 02:04:10 Proxy from: 127.0.0.1:9090, to: prometheus:9090 (10.62.0.4)
```

lines 6-41/41 (END)

- Screenshot of OpenFaas Gateway after deploying the functions
This is the UI screenshot of the OpenFaas gateway which is available at 127.0.0.1:8080 (on guest VM, 3080 on host VM) which lists all the functions deployed on the OpenFaas.



- Screenshot of invoking slack-request and slack-interactive functions
 - Slack-interactive

The command-line invocation of slack-interactive using echo and faas-cli.

```
root@kri:~/final# echo '{"Name": "King"}' | faas-cli invoke slack-interactive
{"attachments": [{"replace_original": true, "response_type": "ephemeral", "fallback": "Required plain-text summary of the attachment.", "color": "#36a64f", "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!", "author_name": "", "author_link": "https://github.com/KrithikNaralasetty", "author_icon": "https://image.shutterstock.com/image-photo/three-best-friends-near-coastline-600w-1017156991.jpg", "title": "COEN 241", "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "text": "Head over to COEN 241", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-amp-photography/visual-identity-toolkit/logos-amp-seals/Mission-Dont3.png", "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "footer": "Slack Apps built on OpenFaas", "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png", "ts": 123456789}]}
root@kri:~/final# _
```

The UI invocation of slack-interactive function which responds with the body of the JSON object

slack-interactive

Status

Ready

Replicas

4

Invocation count

4

Image

docker.io/knaralasetty/slack-interactive:latest

URL

http://127.0.0.1:3080/function/slack-interactive

Function process

python3 index.py

Invoke function

INVOKE

Text

☒ JSON

Download

Request body

{"Name": "King"}

Response status

200

Round-trip (s)

0.412

Response body

```
{
  "attachments": [
    {
      "replace_original": true,
      "response_type": "ephemeral",
      "fallback": "Required plain-text summary of the attachment.",
      "color": "#36a64f",
      "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!",
      "author_name": "",
      "author_link": "https://github.com/KrithikNaralasetty",
      "author_icon": "https://image.shutterstock.com/image-photo/three-best-friends-near-coastline-600w-1017156991.jpg",
      "title": "COEN 241",
      "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/",
      "text": "Head over to COEN 241",
      "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-amp-photography/visual-identity-toolkit/logos-amp-seals/Mission-Dont3.png",
      "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/",
      "footer": "Slack Apps built on OpenFaas",
      "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png",
      "ts": 123456789
    }
  ]
}
```

- Slack-request

The command-line invocation of slack-interactive using echo and faas-cli.

```
root@kri:~/final# echo '{"Name": "King"}' | faas-cli invoke slack-request
{"text": "Serverless Message", "attachments": [{"title": "The Awesome world of Cloud Computing! COEN 241", "fields": [{"title": "Amazing Level", "value": "100", "short": true}], "author_name": "https://github.com/KrithikNaralasetty", "author_icon": "", "image_url": "https://image.shutterstock.com/image-photo/three-best-friends-near-coastline-600w-1017156991.jpg"}, {"title": "About COEN 241", "text": "COEN 241 is the most awesome class ever!."}], [{"fallback": "Would you recommend COEN 241 to your friends?", "title": "Would you recommend COEN 241 to your friends?", "callback_id": "response123", "color": "#3AA3E3", "attachment_type": "default", "actions": [{"name": "recommend", "text": "Of Course!", "type": "button", "value": "recommend"}, {"name": "definitely", "text": "Most Definitely!", "type": "button", "value": "definitely"}]}]}
root@kri:~/final# _
```

The UI invocation of slack-request function which responds with the body of the JSON object.

slack-request

StatusReadyReplicas1Invocation count6Imagedocker.io/knaralasetty/slack-request:latestURLhttp://127.0.0.1:3080/function/slack-requestFunction processpython3 index.py

Invoke function

INVOKE

☐ Text

☒ JSON

☐ Download

Request body

{"Name": "King"}

Response status200Round-trip (s)0.376

Response body

```
{
  "text": "Serverless Message",
  "attachments": [
    {
      "title": "The Awesome world of Cloud Computing! COEN 241",
      "fields": [
        {
          "title": "Amazing Level",
          "value": "100",
          "short": true
        }
      ]
    },
    {
      "title": "About COEN 241",
      "text": "COEN 241 is the most awesome class ever!."
    }
  ],
  "author_name": "https://github.com/KrithikNaralasetty",
  "author_icon": "",
  "image_url": "https://image.shutterstock.com/image-photo/three-best-friends-near-coastline-600w-1017156991.jpg"
},
  {
    "title": "Would you recommend COEN 241 to your friends?",
    "callback_id": "response123",
    "color": "#3AA3E3",
    "attachment_type": "default",
    "actions": [
      {
        "name": "recommend",
        "text": "Of Course!",
        "type": "button",
        "value": "recommend"
      },
      {
        "name": "definitely",
        "text": "Most Definitely!",
        "type": "button",
        "value": "definitely"
      }
    ]
  }
]
```

```
{
  "text": "Serverless Message",
  "attachments": [
    {
      "title": "The Awesome world of Cloud Computing! COEN 241",
      "fields": [
        {
          "title": "Amazing Level",
          "value": "100",
          "short": true
        }
      ]
    },
    {
      "title": "About COEN 241",
      "text": "COEN 241 is the most awesome class ever!."
    }
  ],
  "author_name": "https://github.com/KrithikNaralasetty",
  "author_icon": "",
  "image_url": "https://image.shutterstock.com/image-photo/three-best-friends-near-coastline-600w-1017156991.jpg"
},
  {
    "title": "Would you recommend COEN 241 to your friends?",
    "callback_id": "response123",
    "color": "#3AA3E3",
    "attachment_type": "default",
    "actions": [
      {
        "name": "recommend",
        "text": "Of Course!",
        "type": "button",
        "value": "recommend"
      },
      {
        "name": "definitely",
        "text": "Most Definitely!",
        "type": "button",
        "value": "definitely"
      }
    ]
  }
]
```