COEN 241: Cloud Computing Serverless Infrastructure
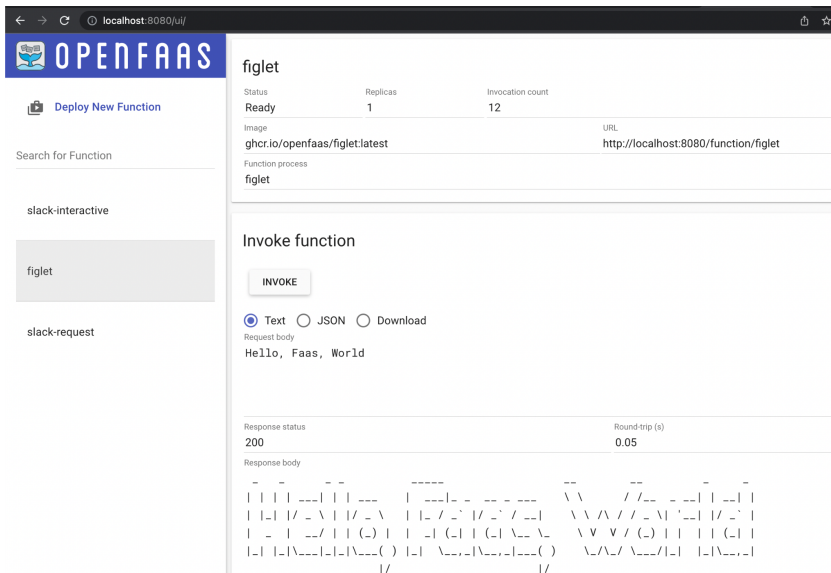
Janan Gandhi (W1607782)

Screenshots

1. Screenshot of invoking figlet using faas-cli and UI

```
jgandhi@jgandhi:~/project/functions$  faas-cli list
Function                        Invocations    Replicas
figlet                          10             1
slack-interactive               14             1
slack-request                   5              1
jgandhi@jgandhi:~/project/functions$ faas-cli store inspect figlet
Info for: Figlet

Name        figlet
Description Generate ASCII logos with the figlet CLI
Image       ghcr.io/openfaas/figlet:latest
Process     figlet
Repo URL    https://github.com/openfaas/store-functions

jgandhi@jgandhi:~/project/functions$ echo "Hello, FaaS, world" | faas-cli invoke figlet
 _   _       _ _               _____           _                    _         _
| | | | ___ | | | ___        |  ___|_ _  __ _ / ___|          __      __   _ __| |   __| |
| |_| |/ _ \| | |/ _ \       | |_ / _` |/ _` \___ \    \ \ /\ / _ \| '__| | |/ _` |
|  _  |  __/| | | (_) |      |  _| (_| | (_| |___) |    \ V  V / (_) | | |  | | (_| |
|_| |_|\___|_|_|\___( )      |_|  \__,_|\__,_|____( )    \_/\_/ \___/|_|  |_|\__,_|
                    |/                            |/
jgandhi@jgandhi:~/project/functions$ █
```

2. Slack request handler.py

```python
handler.py

import json
import urllib

def handle(req):
    urlstring = urllib.unquote(req).decode('utf8').strip('payload=')
    req = json.loads(urlstring)
    data = {
        "text": "Serverless Message",
        "attachments": [{
            "title": "The Awesome world of Cloud Computing! COEN 241",
            "fields": [{
                "title": "Amazing Level",
                "value": "100",
                "short": True
            }],
            "author_name": req['author_name'],
            "author_icon": "",
            "image_url": req['image_url']
        },
        {
            "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"
                }
            ]
        }]
    }
    return json.dumps(data)
```
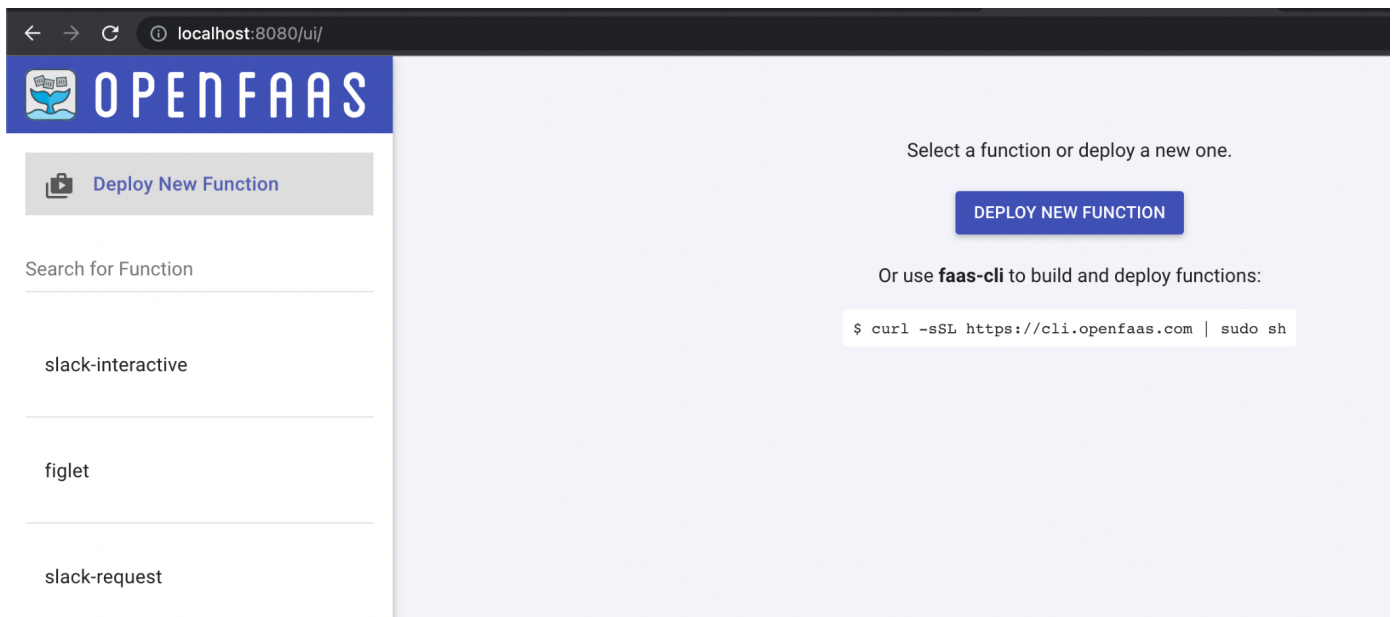
3. Slack interactive handler.py

```python
import json
import urllib

def handle(req):
    urlstring = urllib.unquote(req).decode('utf8').strip('payload=')
    req = json.loads(urlstring)
    data = {
        "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": req['author_link'],
                "author_icon": req['author_icon'],
                "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
            }
        ]
    }
    return json.dumps(data)
```

4. Screenshot of running sudo journalctl -u faasd --lines 40

```
jgandhi@jgandhi:~/project/functions$ sudo journalctl -u faasd --lines 40
[sudo] password for jgandhi:
-- Logs begin at Sun 2022-05-08 06:38:17 UTC, end at Mon 2022-05-09 21:33:16 UT>
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 - gateway
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 - queue-worker
May 08 07:26:21 jgandhi faasd[618]: Starting: prometheus
May 08 07:26:21 jgandhi faasd[618]: Creating local directory: /var/lib/faasd/pr>
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 Running prometheus with>
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 Created container: prom>
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 prometheus has IP: 10.6>
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 Task: prometheus      >
May 08 07:26:21 jgandhi faasd[618]: Starting: basic-auth-plugin
May 08 07:26:21 jgandhi faasd[618]: 2022/05/08 07:26:21 Created container: basi>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 basic-auth-plugin has I>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Task: basic-auth-plugin>
May 08 07:26:22 jgandhi faasd[618]: Starting: nats
May 08 07:26:22 jgandhi faasd[618]: Creating local directory: /var/lib/faasd/na>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Running nats with user:>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Created container: nats
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 nats has IP: 10.62.0.4
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Task: nats         Conta>
May 08 07:26:22 jgandhi faasd[618]: Starting: gateway
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Created container: gate>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 gateway has IP: 10.62.0>
May 08 07:26:22 jgandhi faasd[618]: 2022/05/08 07:26:22 Task: gateway        Co>
lines 1-23
```

5. Screenshot of OpenFaas gateway UI

6. Screenshot of invoking slack-request and slack-interactive

Invoking slack request from faas-cli:

```
jgandhi@jgandhi:~/project/functions$ faas-cli invoke slack-request
Reading from STDIN - hit (Control + D) to stop.
{"author_name": "Janan Gandhi", "image_url" : "https://avatars.githubusercontent.com/u/11367713?v=4"}
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing L
evel"}], "author_icon": "", "image_url": "https://avatars.githubusercontent.com/u/11367713?v=4", "author_name"
: "Janan Gandhi", "title": "The Awesome world of Cloud Computing! COEN 241"}, {"text": "COEN 241 is the most a
wesome class ever!.", "title": "About COEN 241"}, {"title": "Would you recommend COEN 241 to your friends?", "
color": "#3AA3E3", "actions": [{"text": "Of Course!", "type": "button", "name": "recommend", "value": "recomme
nd"}, {"text": "Most Definitely!", "type": "button", "name": "definitely", "value": "definitely"}], "callback_
id": "response123", "fallback": "Would you recommend COEN 241 to your friends?", "attachment_type": "default"}
]}
jgandhi@jgandhi:~/project/functions$
```

Invoking slack interactive from faas-cli:

```
jgandhi@jgandhi:~/project/functions$ faas-cli invoke slack-interactive
Reading from STDIN - hit (Control + D) to stop.
{"author_link": "https://github.com/janangandhi/", "author_icon" : "https://avatars.githubusercontent.com/u/11
367713?v=4"}
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/janangandhi/",
"color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "",
"title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/c
ourse-descriptions/", "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", "response_type": "ephemeral", "re
place_original": true, "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_2
56.png", "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!", "fallback": "Required plain-tex
t summary of the attachment.", "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-c
omputer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/11
367713?v=4"}]}
```

Invoking slack request from OpenFaas UI:

Invoking slack interactive from OpenFaas UI:

OPENFAAS

Deploy New Function

Search for Function

slack-interactive

figlet

slack-request

slack-interactive

Status   Replicas   Invocation count
Ready   1   16

Image   URL
docker.io/janangandhi/slack-interactive:latest   http://localhost:8080/function/slack-interactive

Function process
python index.py

Invoke function

INVOKE

○ Text ● JSON ○ Download
Request body
{"author_link": "https://github.com/janangandhi/", "author_icon" : "https://avatars.githubusercontent.com/u/11367713?v=4"}

Response status   Round-trip (s)
200   0.164

Response body
{
  "attachments": [
    {
      "footer": "Slack Apps built on OpenFaas",
      "author_link": "https://github.com/janangandhi/",
      "color": "#36a64f",
      "text": "Head over to COEN 241",
      "title": "COEN 241",
      "ts": 123456789,
      "author_name": "",
      "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/",
      "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",
      "response_type": "ephemeral",
      "replace_original": true,
      "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png",
      "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!",
      "fallback": "Required plain-text summary of the attachment.",
      "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/",
      "author_icon": "https://avatars.githubusercontent.com/u/11367713?v=4"
    }
  ]
}

Answers

1. a) Curl for slack-request

curl http://localhost:8080/function/slack-request -d '{"author_name": "Janan Gandhi", "image_url" : "https://avatars.githubusercontent.com/u/11367713?v=4"}'

b) faas-cli for slack-request

faas-cli invoke slack-request

2. Response from slack-request

Request: {"author_name": "Janan Gandhi", "image_url" : "https://avatars.githubusercontent.com/u/11367713?v=4"}

Response: {"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://avatars.githubusercontent.com/u/11367713?v=4", "author_name": "Janan Gandhi", "title": "The Awesome world of Cloud Computing! COEN 241"}, {"text": "COEN 241 is the most awesome class ever!.", "title": "About COEN 241"}, {"title": "Would you recommend COEN 241 to your friends?", "color": "#3AA3E3", "actions": [{"text": "Of Course!", "type": "button", "name": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "definitely", "value": "definitely"}], "callback_id": "response123", "fallback": "Would you recommend COEN 241 to your friends?", "attachment_type": "default"}]}

3. a) Curl for slack-interactive

curl http://localhost:8080/function/slack-interactive -d '{"author_link": "https://github.com/janangandhi/", "author_icon" : "https://avatars.githubusercontent.com/u/11367713?v=4"}'

b) faas-cli for slack-interactive

faas-cli invoke slack-interactive

4. Response from slack-interactive

Request: {"author_link": "https://github.com/janangandhi/", "author_icon" : "https://avatars.githubusercontent.com/u/11367713?v=4"}

Response: {"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/janangandhi/", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "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", "response_type": "ephemeral", "replace_original": true, "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png", "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!", "fallback": "Required plain-text summary of the attachment.", "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/11367713?v=4"}]}

5. How to pass arguments to the function

We can pass different arguments to the function in the following ways:

1. Curl - We can pass arguments to the function by invoking it using the curl command and passing the arguments using the -d option.
2. OpenFaas UI - Using the OpenFaas UI, we can pass arguments to the functions while invoking them by selecting the type of requests like text or JSON and providing the request body.
3. YML files - We can add the content type in the yml file of the function to reflect the type as plain text or JSON.

6. Slack interactive to read inputs

We can modify the function to react to different inputs by parsing through the Action URL invocation payload which includes a "actions" key containing the "selected options". In these selected options we can find the "value" of the field we require. We can identify the correct action we are looking for using the "name" and "callback_id" when this action is invoked.