

# COEN 241: HW 2

## Own Serverless Infrastructure

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1. Screenshot of invoking the figlet function:

a) Via cli : Invoke the function using the command: “faas-cli invoke figlet”

Gives the output of the input string in the style shown below.

```
sk1@sk1-VirtualBox:~$ ^C
sk1@sk1-VirtualBox:~$ ^C
sk1@sk1-VirtualBox:~$ faas-cli invoke figlet
Reading from STDIN - hit (Control + D) to stop.
Serverless Infrastructure in COEN241

Serverless
Infrastructure in
COEN241
```

b) Via OpenFaas Portal: Invoke the function by giving input text.

> “Serverless Infrastructure in COEN241”

The screenshot shows the OpenFaas Portal interface for the 'figlet' function. At the top, there's a header with 'figlet', 'Status: Ready', 'Replicas: 1', 'Invocation count: 6', and 'URL: http://localhost:3080/function/figlet'. Below this, there's a section 'Invoke function' with a button 'INVOKE'. Underneath, there are radio buttons for 'Text' (selected), 'JSON', and 'Download'. The 'Request body' is 'Serverless Infrastructure in COEN241'. Below this, there's a section 'Response status' showing '200' and 'Round trip (s): 0.126'. The 'Response body' is a large ASCII art image of the text 'Serverless Infrastructure in COEN241'.

2. Complete slack-request/handler.py:

```
#Importing required libraries
import json

#Function to handle the request
def handle(req):
    data = {
        "text": "Serverless Message",
        "attachments": [{
            "title": "The Awesome world of Cloud Computing! COEN 241",
            "fields": [{
                "title": "Amazing Level",
                "value": "100",
                "short": True
            }],
            #Input of author name and URL of author image
            "author_name": "Surya",
            "author_icon": "https://imgur.com/a/NL7nTRF",
            "image_url": "https://imgur.com/a/NL7nTRF"
        },
        {
            "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"
                }
            ]
        }
    ]
}
```

### 3. Complete slack-interactive/handler.py:

#Importing required libraries

import json

import urllib

#Function to handle the request

def handle(req):

#Setting the page encoding as UTF-8 and getting the req

urlstring = urllib.unquote(req).decode('utf8').strip('payload=')

#Loading the URL

response = 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": "Surya",

"author\_link": "http://github.com/skiranu/COEN241-HW2",

"author\_icon": "https://imgur.com/a/NL7nTRF",

"title": "COEN 241",

"title\_link":

"https://www.scu.edu/engineering/academic-programs/departments-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/departments-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. Provide a screenshot of running the following command:

**sudo journalctl -u faasd --lines 40**

```
sk1@sk1-VirtualBox:~/functions$ sudo journalctl -u faasd --lines 40
[sudo] password for sk1:
-- Logs begin at Sat 2021-10-16 14:29:04 PDT, end at Tue 2021-11-09 22:00:55 PST. --
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 Start-up order:
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 - prometheus
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 - basic-auth-plugin
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 - nats
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 - gateway
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:53 - queue-worker
Nov 09 20:17:53 sk1-VirtualBox faasd[1132]: Starting: prometheus
Nov 09 20:17:55 sk1-VirtualBox faasd[1132]: 2021/11/09 20:17:55 Created container: prometheus
Nov 09 20:18:09 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:09 prometheus has IP: 10.62.0.2
Nov 09 20:18:09 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:09 Task: prometheus Container: prometheus
Nov 09 20:18:09 sk1-VirtualBox faasd[1132]: Starting: basic-auth-plugin
Nov 09 20:18:12 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:12 Created container: basic-auth-plugin
Nov 09 20:18:13 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:13 basic-auth-plugin has IP: 10.62.0.3
Nov 09 20:18:13 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:13 Task: basic-auth-plugin Container: basic-auth-plugin
Nov 09 20:18:13 sk1-VirtualBox faasd[1132]: Starting: nats
Nov 09 20:18:17 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:17 Created container: nats
Nov 09 20:18:18 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:18 nats has IP: 10.62.0.4
Nov 09 20:18:18 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:18 Task: nats Container: nats
Nov 09 20:18:18 sk1-VirtualBox faasd[1132]: Starting: gateway
Nov 09 20:18:23 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:23 Created container: gateway
Nov 09 20:18:24 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:24 gateway has IP: 10.62.0.5
Nov 09 20:18:24 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:24 Task: gateway Container: gateway
Nov 09 20:18:24 sk1-VirtualBox faasd[1132]: Starting: queue-worker
Nov 09 20:18:27 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:27 Created container: queue-worker
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 queue-worker has IP: 10.62.0.6
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Task: queue-worker Container: queue-worker
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Supervisor init done in: 40.496901818s
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Looking up IP for: "gateway"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver rebuilding map
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "localhost"="127.0.0.1"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "faasd-provider"="10.62.0.1"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "prometheus"="10.62.0.2"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "basic-auth-plugin"="10.62.0.3"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "nats"="10.62.0.4"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "gateway"="10.62.0.5"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Resolver: "queue-worker"="10.62.0.6"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Looking up IP for: "prometheus"
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Proxy from: 127.0.0.1:9090, to: prometheus:9090 (10.62.0.2)
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 faasd: waiting for SIGTERM or SIGINT
Nov 09 20:18:28 sk1-VirtualBox faasd[1132]: 2021/11/09 20:18:28 Proxy from: 0.0.0.0:8080, to: gateway:8080 (10.62.0.5)
sk1@sk1-VirtualBox:~/functions$
```

Gives the logs of the faas system, we are limiting the output to 40 lines, which have the information about the start-up order, nats, queue-worker, authentication plugin, Prometheus and gateway, and also the proxy port information.

5. Provide a screenshot of your OpenFaaS gateway AFTER deploying figlet, slack-handler and slack-interactive functions:

The screenshot shows the OpenFaaS gateway interface. On the left, there is a sidebar with the OpenFaaS logo and a 'Deploy New Function' button. Below this is a search bar labeled 'Search for Function'. A list of functions is displayed: 'figlet', 'slack-interactive' (highlighted), and 'slack-request'. The main panel shows details for the 'slack-interactive' function. It includes a table with the following data:

Status	Replicas	Invocation count
Ready		3

Below the table, the 'Image' is listed as 'docker.io/sudayaku/slack-interactive:latest' and the 'Function process' is 'python index.py'. The 'Invoke function' section has an 'INVOKE' button and radio buttons for 'Text' (selected), 'JSON', and 'Download'. There are input fields for 'Request body', 'Response status', and 'Response body'.

The screenshot contains the functions invoked from the VM, which can be accessed through localhost 8080 or the forwarded port(3080) from the Host machine.

```
sk1@sk1-VirtualBox:~/functions$ faas-cli list
Function              Invocations  Replicas
figlet                 2            1
slack-interactive      90           1
slack-request          7            1
sk1@sk1-VirtualBox:~/functions$
```

6. Provide a screenshot of invoking slack-interactive and slack-request functions
- 6.1) Invoking slack-interactive via cli in VM : `echo '{"user": "surya"}' | faas-cli invoke slack-interactive`

```
skirani-VirtualBox: /functions$ echo '{"user": "Surya"}' | faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "http://github.com/skiranu/COEN241-HW2", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "Surya", "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-and-photography/visual-identity-toolkit/logos-and-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://imgur.com/a/NL7nTRF"}]}
```

## 6.2) Invoking slack-interactive via OpenFaas Portal:

slack-interactive	
Status	Invocation count
Ready	7
Image	URL
docker.io/sudayaku/slack-interactive:latest	http://localhost:3080/function/slack-interactive
Function process	
python index.py	

  

Invoke function

INVOKE

☒ Text ☐ JSON ☐ Download

Request body

`{"user": "surya"}`

  

Response status	Round-trip (s)
200	0.425
Response body	
<pre>{   "attachments": [     {       "footer": "Slack Apps built on OpenFaas",       "author_link": "http://github.com/skiranu/COEN241-HW2",       "color": "#36a64f",       "text": "Head over to COEN 241",       "title": "COEN 241",       "ts": 123456789,       "author_name": "Surya",       "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-and-photography/visual-identity-toolkit/logos-and-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://imgur.com/a/NL7nTRF"     }   ] }</pre>	

### 6.3) Invoking slack-request via cli in VM : echo surya | faas-cli invoke slack-request

```
skigski-VirtualBox:~/Functions$ echo surya | faas-cli invoke slack-request
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "https://imgur.com/a/NL7nTRF", "image_url": "https://imgur.com/a/NL7nTRF", "author_name": "Surya", "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"}]}
```

6.4) Invoking slack-request via OpenFaas Portal: Login into the localhost 8080/host machines localhost 3080 after port forwarding to invoke the openFaas functions.

slack-request

Status	Ready	Replicas	7	Invocation count	
Image	docker.io/sudayaku/slack-request:latest				URL http://localhost:3080/function/slack-request
Function process	python index.py				

Invoke function

INVOKE

☒ Text ☐ JSON ☐ Download

Request body

Response status	200	Roundtrip (s)	0.26
Response body	{ "text": "Serverless Message", "attachments": [ { "fields": [ { "short": true, "value": "100", "title": "Amazing Level" } ], "author_icon": "https://imgur.com/a/NL7nTRF", "image_url": "https://imgur.com/a/NL7nTRF", "author_name": "Surya", "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" } ] }		