

CSEN 241 HW1
Your Own Serverless Infrastructure
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Git: <https://github.com/RuihaoWei95/CSE241.git>

Commit:

ea86556

Provide a screenshot of invoking the figlet function:

```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo "Hello!" | faas-cli invoke figlet
Hello
```

Provide a screenshot of running the following command:

`sudo journalctl -u faasd --lines 40`

```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ sudo journalctl -u faasd --lines 40
Feb 22 20:12:52 BlueBreaker faasd[163]: Removing old container for: prometheus
Feb 22 20:12:52 BlueBreaker faasd[163]: Removing old container for: gateway
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 Start-up order:
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 - nats
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 - queue-worker
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 - prometheus
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 - gateway
Feb 22 20:12:52 BlueBreaker faasd[163]: Starting: nats
Feb 22 20:12:52 BlueBreaker faasd[163]: Creating local directory: /var/lib/faasd/nats
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 Running nats with user: "65534"
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 Created container: nats
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 nats has IP: 10.62.0.2
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 Task: nats Container: nats
Feb 22 20:12:52 BlueBreaker faasd[163]: Starting: queue-worker
Feb 22 20:12:52 BlueBreaker faasd[163]: 2024/02/22 20:12:52 Created container: queue-worker
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 queue-worker has IP: 10.62.0.3
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 Task: queue-worker Container: queue-worker
Feb 22 20:12:53 BlueBreaker faasd[163]: Starting: prometheus
Feb 22 20:12:53 BlueBreaker faasd[163]: Creating local directory: /var/lib/faasd/prometheus
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 Running prometheus with user: "65534"
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 Created container: prometheus
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 prometheus has IP: 10.62.0.4
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 Task: prometheus Container: prometheus
Feb 22 20:12:53 BlueBreaker faasd[163]: Starting: gateway
Feb 22 20:12:53 BlueBreaker faasd[163]: 2024/02/22 20:12:53 Created container: gateway
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 gateway has IP: 10.62.0.5
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Task: gateway Container: gateway
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Supervisor init done in: 1 second
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Looking up IP for: "gateway"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Looking up IP for: "prometheus"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver rebuilding map
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "localhost"="127.0.0.1"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "faasd-provider"="10.62.0.1"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "nats"="10.62.0.2"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "queue-worker"="10.62.0.3"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "prometheus"="10.62.0.4"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Resolver: "gateway"="10.62.0.5"
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 faasd: waiting for SIGTERM or SIGINT
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Proxy from: 127.0.0.1:9090, to: prometheus:9090 (10.62.0.4)
Feb 22 20:12:54 BlueBreaker faasd[163]: 2024/02/22 20:12:54 Proxy from: 0.0.0.0:8080, to: gateway:8080 (10.62.0.5)
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$
```

Provide a screenshot of your OpenFaas gateway AFTER deploying figlet, slack-handler and slack-interactive functions

```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ faas-cli list
Function      Invocations  Replicas
chatbot       28           1
figlet        12           1
helloworld    0            0
slack-interactive  0            0
slack-request 0            0
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$
```

Provide a screenshot of invoking slack-request and slack-interactive functions

Slack-request:


```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo 1 | faas-cli invoke slack-request
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "408", "title": "Amazing Level!"}, {"author": "RuihaoWei", "image": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-toolkit/logos-and-seals/Mission-Dont3.png", "response_type": "ephemeral", "replace_original": true, "footer": "https://a.slack-edge.com/45901/marketing/img/brand/meta/slack-hack-216.png", "pretext": "Ahh yeah! Great choice, CSEN 241 is absolutely amazing!", "fallback": "Required plain-text summary of the attachment.", "thumb_url": "https://www.scu.edu/engineering/academic-department-of-computer-engineering/graduate/course-descriptions/", "author_icon": ""}]}]}
```

Slack-interactive:

```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo 1 | faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "image": "https://www.scu.edu/engineering/academic-program/departments-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-toolkit/logos-and-seals/Mission-Dont3.png", "response_type": "ephemeral", "replace_original": true, "footer": "https://a.slack-edge.com/45901/marketing/img/brand/meta/slack-hack-216.png", "pretext": "Ahh yeah! Great choice, CSEN 241 is absolutely amazing!", "fallback": "Required plain-text summary of the attachment.", "thumb_url": "https://www.scu.edu/engineering/academic-department-of-computer-engineering/graduate/course-descriptions/", "author_icon": ""}]}]}
```

Provide a screenshot of invoking three different cases of the chatbot

```
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo "name" | faas-cli invoke chatbot
I'm Ruihao! What's your name?
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo "date" | faas-cli invoke chatbot
Today is 2024-02-23 at 20:20:21
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions$ echo "figlet Hello COEN241!" | faas-cli invoke chatbot
Hello COEN241!
```



Questions

- What is the command to invoke the slack-request function?
 - Via curl: curl <http://127.0.0.1:8080/function/slack-request>
 - Via faas-cli: echo {url} | faas-cli invoke slack-request
- What is the output you see when you invoke the slack-request function?
 - A JSON object response return by the handler
- What is the command to invoke the slack-interactive function?
 - Via curl: curl http://127.0.0.1:8080/function/slack-interactive
 - Via faas-cli: echo {url} | faas-cli invoke slack-interactive
- What is the output you see when you invoke the slack-interactive function?
 - A JSON object response return by the handler
- How would you pass different arguments to the functions?
 - Use bash command 'echo {parameters} | faas-cli invoke {functions}'
- How would you change the slack-interactive function to react to different inputs?
 - I will destructure the payload and use destructured parameter in the JSON response.
- How long does it take for the chat response to come back?

a. First request does not call figlet: 397ms

```
echo "name" | azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo "name" | faas-cli invoke chatbot
end="date +%s%N"
echo Execution time was `expr $end - $start` nanoseconds.I'm a bot, and I don't have a name
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ end="date +%s%N"
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo Execution time was `expr $end - $start` nanoseconds.
Execution time was 397390234 nanoseconds.
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$
```

b. Second request does not call figlet: 363ms

```
end="date +%s%N"
echo Execution time was `expr $end - $start` nanoseconds.I'm a bot, and I don't have a name
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo "name" | faas-cli invoke chatbot
e was `expr $end - $start` nanoseconds.I'm Ruihao! What's your name?
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ end="date +%s%N"
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo Execution time was `expr $end - $start` nanoseconds.
Execution time was 363365950 nanoseconds.
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$
```

c. Average: 381ms

WUOLAH

$(401 + 397 + 363 + 387 + 466 + 357 + 364 + 348 + 361 + 370)/10$

NATURAL LANGUAGE

MATH INPUT

EXTENDED KEYBOARD


EXAMPLES

UPLOAD

RANDOM


d. First request does call figlet: 360ms

```
echo Execution time was `expr $end - $start` nanoseconds.Hi
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo "figlet Hi" | faas-cli invoke chatbot
Hi
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ end="date +%s%N"
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo Execution time was `expr $end - $start` nanoseconds.
Execution time was 360892595 nanoseconds.
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$
```



e. Second request does call figlet: 454ms

```
Execution time was 360892595 nanoseconds.
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ start="date +%s%N"
echo "figlet Hi" | faazraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo "figlet Hi" | faas-cli invoke chatbot
Hi
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ end="date +%s%N"
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$ echo Execution time was `expr $end - $start` nanoseconds.
Execution time was 454785848 nanoseconds.
azraelkisar@BlueBreaker:~/cse241/CSE241/HW2/functions/slack-interactive$
```



f. Average: 393ms



NATURAL LANGUAGE

MATH INPUT

EXTENDED KEYBOARDEXAMPLESUPLOADRANDOM

8. Now try sending a series of requests to the chatbot in parallel. At what queries per second does OpenFaaS add a new instance of the function?

2.63