

NWEN 406: Project #1

Due on Friday, August 7, 2015

Boxiong Tan

Project Objectives

1. Obtain an Amazon AWS micro-instance and configure it.
2. Write a server which could receive and send messages.

Micro-instance Configuration

Major steps of configuration:

1. Choose an Amazon Machine Image (AMI) → **Ubuntu Server**
2. Choose an instance Type → **t2.micro**
3. Configure instance Details

The screenshot shows the 'Configure Instance Details' step in the AWS Management Console. The settings are as follows:

- Number of instances:** 1
- Purchasing option:** ☐ Request Spot Instances
- Network:** vpc-256cb640 (172.31.0.0/16) (default) [Create new VPC](#)
- Subnet:** No preference (default subnet in any Availability Zone) [Create new subnet](#)
- Auto-assign Public IP:** Use subnet setting (Enable)
- IAM role:** None [Create new IAM role](#)
- Shutdown behavior:** Stop
- Enable termination protection:** ☐ Protect against accidental termination
- Monitoring:** ☐ Enable CloudWatch detailed monitoring
[Additional charges apply.](#)
- Tenancy:** Shared tenancy (multi-tenant hardware)
[Additional charges will apply for dedicated tenancy.](#)

4. Add storage → **8 GB General Purpose (SSD)**
5. Tag Instance → **"Max": "MyServer"**
6. Configure Security Group → **All traffic**

After configuration, launch the micro-instance.

Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP	Key Name	Monitoring	Launch Time
i-645168b8	t2.micro	ap-southeast-2b	running	2/2 checks ...	None	ec2-54-153-185-41.ap-s...	54.153.185.41	Max	disabled	July 29, 2015 at 1:19:00

Web Server

Programming Environment

Programming language: **Python v2.7**

Web Server framework: **Flask v0.10.1**

Description

The Restful Web server runs in the background and listening port 80. When receiving a POST request, it first replies the request by code 202. Then it starts a thread to handle the message.

For the sake of simplicity, our team decides to pass a json message between members. This message mainly contains a string message, which each member must edited it when received the message. Each member could handle this string message with a simple hashing or string mashing algorithm.

Algorithm 1 Web server

```

Listen to HTTP request on myIP:80/api
if get POST request then
    Start a thread handle the received data
    reply the request with "code 202"
end if
Thread unpack the received data
Thread identify the input message and reverse the message string
Thread edit the index number and count
Thread Pack the edited message as a dictionary
Thread add edited message dictionary to "max" message list
repeat
    Thread pop up the first address in the order listed
    for three times do
        and try to send the json package to the address. The request timeout is set to 2 seconds.
    end for
until Send successfully or order list is empty

```

This is an example of starting message:

```

1 {
2   "value": "thebeginningvalue",
3   "count": 0,
4   "audit": {},
5   "order": [
6     "52.25.73.1",
7     "52.25.246.56",
8     "52.25.246.34",
9     "52.25.185.43",
10    "52.25.56.34",
11    "52.25.127.88"
12  ]
13 }

```

The string message allows characters for input and output are 0-9a-zA-Z. The output at least one character and maximum of 255. i.e. /[0-9a-zA-Z]1,255/

The order of message passing is completely decide by the "order" list predefined by the first sender. If one of the node in the list failed to response, it will be discarded after three times of trying.

Experimental Results

Sending JSON to next address: 52.27.64.194

```

1 {
2   "audit": {
3     "Alex": [
4       {
5         "index": 1,
6         "input": "blasomething",
7         "output": "Areyouoneofthoseboyswhopreferscartowomen",

```

```
8         "time": "2015-08-05 22:17:45 GMT + 0"
9     }
10 ],
11     "max": [
12         {
13             "index": 0,
14             "input": "",
15             "output": "blasomething",
16             "time": "Wed, 05, Aug 2015 22:17:54 GMT"
17         }
18     ]
19 },
20     "count": 2,
21     "order": [
22         "52.27.228.163",
23         "54.68.184.120"
24     ],
25     "value": "Areyouoneofthoseboyswhopreferscarstowomen"
26 }
```

This example shows, “max” starts sending the message to “Alex”. “Alex” further forward this message to 52.27.64.194.