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10.1g: Large Language Models

5. Document loading

Explain what the transformer does to the HTML retrieved by the loader

Look for anything related to computer science and security.

Examine the document cleaning code. What kinds of characters are removed when the text is cleaned?

Spaces are removed, and `\s+`.

What size chunks is the content split into?

10000

What amount of overlap is there between chunks?

1000

How many documents are loaded at a time into the vector database?

The amount of documents varies and depends upon this function:

```
Unset
def add_documents(vectorstore, chunks, n):
    for i in range(0, len(chunks), n):
        vectorstore.add_documents(chunks[i:i+n])
```

6. Document searching

Show the document URLs that are returned for the following queries:

Tell me about the MS program

```
This program queries documents in the RAG database that are similar to whatever is entered. A blank query
>> Tell me about the MS program
Query database for: Tell me about the MS program
Closest document match in database: https://www.pdx.edu/computer-science/master
Document content is: Master of Science The Master of Science (M.S.) in Computer Science is 1 brachang
```

Tell me about the Cybersecurity certificate

```
>> Tell me about the Cybersecurity certificate
Query database for: Tell me about the Cybersecurity certificate
Closest document match in database: https://www.pdx.edu/computer-science/cybersecurity
Document content is: Cybersecurity Graduate Certificate The Cybersecurity Graduate Certificate program requires admission (/../computer-science/node/151) as a graduate student. The program requires 21 hours total of graduate classes. There are two core classes for a total of 6 hours. In addition, five elective classes must be taken for the needed additional 15 credit hours. Certificate Requirements Gain Admission to our Graduate CS Program as either an M.S. or Ph.D. candidate. Note that an M.S. candidate may choose to either get both an M.S. and the Cybersecurity Graduate Certificate, or just complete the Cybersecurity Graduate Certificate. Fill out the G0-19 form (/../gradschool/forms) needed for admission to the certificate program. Make sure you ADD a certificate to your program. You also need your advisor's signature on the form. Your advisor must approve your plan to get the Security Certificate. Please return the completed form to the Graduate Advisor. Once you have submitted your G0-19 form, the Security Admission Committee will meet and approve or deny your application. Applicants will be notified of the committee's decision via email. Course Requirements Required Core Courses (6) CS 591 Introduction to Computer Security (3) CS 595 Web and Cloud Security (3) Five of the following courses or approved substitute courses (15) CS 554 Principles of Software Engineering (3) CS 555 Software Specification and Verification (3) CS 556 Software Implementation and Testing (3) CS 576 Computer Security Seminar (3) CS 585 Cryptography (3) CS 592 Malware Reverse Engineering (3) CS 593 Digital Forensics (3) CS 594 Networking Protocols (3) CS 596 Network Security (3) CS 597 Security in Security (3) (https://docs.google.com/spreadsheets/d/1Zzyb9E1zLw00TYErZfow9i2RMB3b\_PFBa6zWmZMELQs/edit#gid=0)
>> + ... x
brachang
TERMINAL VERSION - Please support brachang
Signal edition here: https://mobaxterm.mobatek.net
```

Tell me about PCEP

```
>> Tell me about PCEP
Query database for: Tell me about PCEP
Closest document match in database: https://www.pdx.edu/computer-science/pcep-internship
Document content is: PCEP Internship What is the PSU/PDX Cooperative Education Program? The PSU/PDX Cooperative Education Program (PCEP) is a two-year cooperative educational program in which Computer Science students work 20 hours per week at one of our local PCEP Partner companies in a series of defined internship roles, while concurrently taking between eight and twelve credits each term on-campus at PSU. Pay begins at $27 an hour with semi-annual raises. New internship cycles start approximately every six months (January and July), and interns must work at two or more PCEP companies in at least two different roles during the program. Why Should I Care? The PCEP co-op will give you real-life experience in two different roles (software development and software automation) at two or more different local software companies while allowing you to take eight to twelve credits of coursework each term on campus. Not only will you gain technical experience, you'll also learn how to work in a professional environment as part of a team developing commercial software for a global customer base, while simultaneously building your professional network. A PCEP co-op will jumpstart your career as a software professional. Who Qualifies? Any student admitted to the B.S. Computer Science degree program at Portland State University, who will have completed CS163, CS205, CS302, and CS314, with grades of B or better, by the time their co-op begins may apply. In addition, applicants must have a 3.0 GPA overall required Computer Science coursework, be over 18, and have the permanent right to work in the United States (some positions require U.S. citizenship). See the Student Expectations for more information. What are the Important Dates I should know about? *All dates are subject to change APRIL 10, 2025 (Thursday): Mandatory Orientation Session via Zoom. One session will be held at noon, and one will be held at 6:30 PM. Preregister for one of these by selecting a time using this registration link (https://docs.google.com/forms/d/e/1FAIpQLSxwB34-i7WkP\_uXwF9mEtB\_wbbr8NZRHNSExZexH\_HyvhHFKT0/viewform). You must attend this session in order to apply to the PCEP program. The registration cut-off is Tuesday, APRIL 8. A Zoom link will be sent to those that register using their @pdx.edu (http://pdx.edu/) e-mail address by Wednesday, APRIL 9. APRIL 21, 2025 (Monday): Applications are due by noon (an application link will be emailed to those that register and attend Orientation). MAY 5, 2025 (Monday): PCEP Finalists invited to the RUSH. MAY 16, 2025 (Friday): PCEP RUSH. MAY 22, 2025 (Thursday): Placements Announced. July 1, 2025 (Tuesday): New interns begin work. Register Who are the PCEP Companies? The PCEP companies are among some of the most exciting software companies in the Portland Metro area. Their markets range from computer security and web analytics to healthcare, social media solutions and county government, as well as everything in between. The PCEP companies are located in downtown Portland, so students have easy walking and public transportation options for getting back and forth between work and school. Many of the PCEP companies support hybrid or completely remote internships. In becoming a PCEP Partner, each company has acknowledged the student's educational goals are primary - they have agreed the internship program must augment, not conflict, with the educational goals of the student. This results in internships that are not only valuable to the company, but are also genuine educational experiences for the student.
>> + ... x
brachang
```

Tell me about the capstone

```
>> Tell me about the capstone
Query database for: Tell me about the capstone
Closest document match in database: https://www.pdx.edu/computer-science/bachelors-program-computer-science-capstone
Document content is: BACHELOR'S PROGRAM IN COMPUTER SCIENCE CAPSTONE Capstone is taken by undergraduate students in the final year of their program. They will work in teams of 6-8 students on a six-month software development project to benefit a company, individual or organization in the community. Sponsoring organizations will be available to students on a regular basis to provide input and feedback as the project develops. New projects begin every quarter (Fall, Winter, Spring and Summer) and last for two quarters. Potential sponsors should consult the Guidelines for Sponsors (https://sites.google.com/pdx.edu/bruceirvin/capstone). The Capstone home page (https://sites.google.com/pdx.edu/bruceirvin/capstone) provides additional information about the program, including Capstone presentation videos.
>> + ... x
brachang
```

8. -

How many credits does it take to complete the MS program?

```
llm>> How many credits does it take to complete the MS program?
It takes 45 credits to complete the MS program. There is also a thesis option.

Please visit the following URLs for more information:

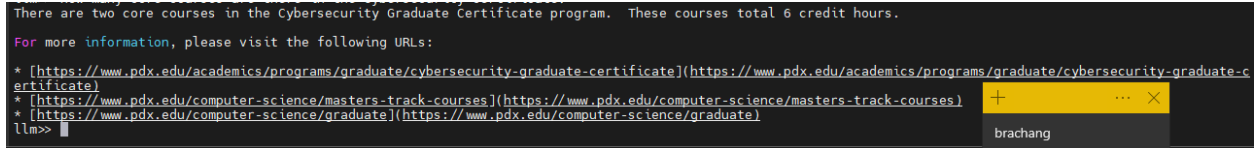
* https://www.pdx.edu/computer-science/cybersecurity
* https://www.pdx.edu/computer-science/masters-track-courses
* https://www.pdx.edu/computer-science/master
llm>> + ... x
brachang
```

How many core courses are there in the Cybersecurity certificate?

```

There are two core courses in the Cybersecurity Graduate Certificate program. These courses total 6 credit hours.
For more information, please visit the following URLs:
* [https://www.pdx.edu/academics/programs/graduate/cybersecurity-graduate-certificate](https://www.pdx.edu/academics/programs/graduate/cybersecurity-graduate-certificate)
* [https://www.pdx.edu/computer-science/masters-track-courses](https://www.pdx.edu/computer-science/masters-track-courses)
* [https://www.pdx.edu/computer-science/graduate](https://www.pdx.edu/computer-science/graduate)
llm>>

```



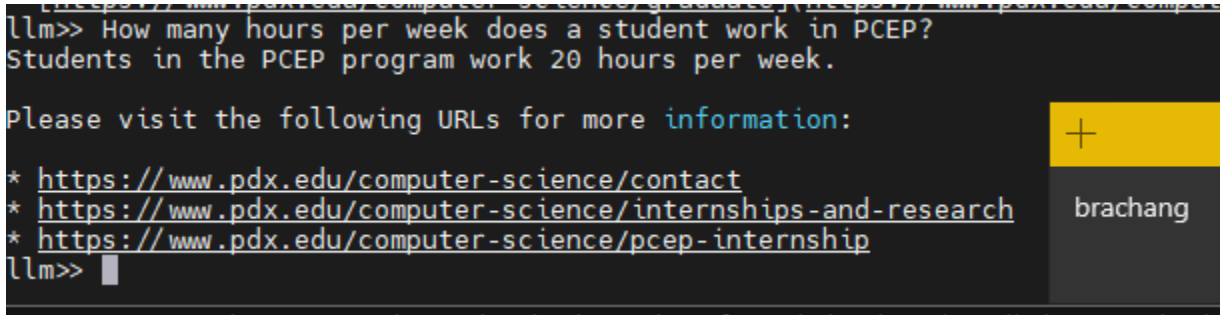
How many hours per week does a student work in PCEP?

```

llm>> How many hours per week does a student work in PCEP?
Students in the PCEP program work 20 hours per week.

Please visit the following URLs for more information:
* https://www.pdx.edu/computer-science/contact
* https://www.pdx.edu/computer-science/internships-and-research
* https://www.pdx.edu/computer-science/pcep-internship
llm>>

```

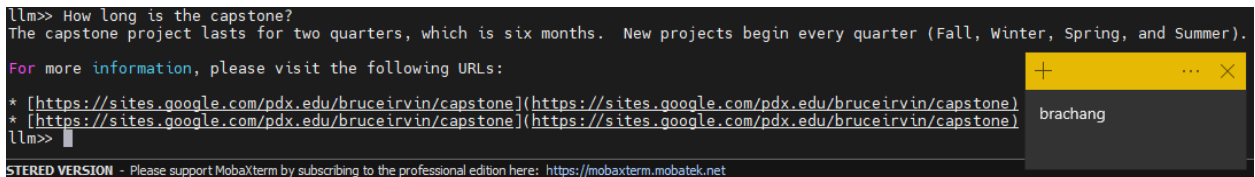


How long is the capstone?

```

llm>> How long is the capstone?
The capstone project lasts for two quarters, which is six months. New projects begin every quarter (Fall, Winter, Spring, and Summer).
For more information, please visit the following URLs:
* [https://sites.google.com/pdx.edu/bruceirvin/capstone](https://sites.google.com/pdx.edu/bruceirvin/capstone)
* [https://sites.google.com/pdx.edu/bruceirvin/capstone](https://sites.google.com/pdx.edu/bruceirvin/capstone)
llm>>

```



11. -

Take a screenshot showing the results of execution

What is the current xkcd?

```

> Enter new AgentExecutor chain...
Thought: I should generate a plan to help with this query and then copy that plan exactly to the controller.
Action: api_planner
Action Input: Find the current xkcd comic. This likely involves a single API call to retrieve the latest comic information.
Observation: 1. GET /info.0.json: This call retrieves the current comic and its metadata. This fulfills the user's request.
Thought: I'm ready to execute the API call.
Action: api_controller
Action Input: 1. GET /info.0.json

> Enter new AgentExecutor chain...
Plan: 1. GET /info.0.json

Thought: I need to fetch the current comic information using the '/info.0.json' endpoint. I'll use 'requests_get' for this.

Action: requests_get
Action Input:
```json
{
 "url": "http://xkcd.com/info.0.json",
 "params": {},
 "output_instructions": "Extract the 'num', 'title', 'img', 'alt', 'transcript' fields."
}
```
Observation: ```json
{
  "num": 3062,
  "title": "Off By One",
  "img": "https://imgs.xkcd.com/comics/off_by_one.png",
  "alt": "It does come at the small cost of a LOT more off-by-40-or-50 errors.",
  "transcript": ""
}
```
Thought: I have successfully retrieved the comic information. I can now return the relevant details to the user.

Final Answer: Comic number 3062, titled "Off By One", with image URL "https://imgs.xkcd.com/comics/off_by_one.png", alt text "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and an empty transcript.

> Finished chain.

Observation: Comic number 3062, titled "Off By One", with image URL "https://imgs.xkcd.com/comics/off_by_one.png", alt text "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and an empty transcript.
Thought: I am finished executing a plan and have the information the user asked for.
Final Answer: The current xkcd comic is number 3062, titled "Off By One". The image URL is https://imgs.xkcd.com/comics/off_by_one.png, the alt text is "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and there is no transcript.

> Finished chain.
{'input': 'What is the current xkcd?', 'output': 'The current xkcd comic is number 3062, titled "Off By One". The image URL is https://imgs.xkcd.com/comics/off_by_one.png, the alt text is "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and there is no transcript.'}
llm>>

```

## What is the image link of the current xkcd?

```

llm>> What is the image link of the current xkcd?

> Enter new AgentExecutor chain...
Thought: I should generate a plan to help with this query and then copy that plan exactly to the controller.
Action: api_planner
Action Input: I need to find the right API calls to get the image link of the current xkcd comic. Assuming an API exists with an endpoint to retrieve this information.
Observation: Plan:
1. GET /info.0.json: This call retrieves information about the current comic, including its metadata. We expect this metadata to contain the image link.
Thought: I'm ready to execute the API calls.
Action: api_controller
Action Input: 1. GET /info.0.json

> Enter new AgentExecutor chain...
Plan: 1. GET /info.0.json

Thought: I need to fetch the current comic's information using the '/info.0.json' endpoint. I'll use 'requests_get' for this.

Action: requests_get
Action Input:
```json
{
  "url": "http://xkcd.com/info.0.json",
  "params": {},
  "output_instructions": "Extract the 'num', 'title', 'img', 'alt', 'transcript' fields."
}
```
Observation: ```json
{
 "num": 3062,
 "title": "Off By One",
 "img": "https://imgs.xkcd.com/comics/off_by_one.png",
 "alt": "It does come at the small cost of a LOT more off-by-40-or-50 errors.",
 "transcript": ""
}
```
Thought: I have successfully retrieved the comic information. I can now present the final answer to the user.

Final Answer: The current XKCD comic is number 3062, titled "Off By One". The image URL is https://imgs.xkcd.com/comics/off_by_one.png, the alt text is "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and the transcript is empty.

> Finished chain.

Observation: The current XKCD comic is number 3062, titled "Off By One". The image URL is https://imgs.xkcd.com/comics/off_by_one.png, the alt text is "It does come at the small cost of a LOT more off-by-40-or-50 errors.", and the transcript is empty.
Thought: I am finished executing a plan and have the information the user asked for.
Final Answer: The image link of the current xkcd comic is https://imgs.xkcd.com/comics/off_by_one.png

> Finished chain.
{'input': 'What is the image link of the current xkcd?', 'output': 'The image link of the current xkcd comic is https://imgs.xkcd.com/comics/off_by_one.png'}
llm>>

```

What was xkcd 327 about?

```
llm>> What was xkcd 327 about?

> Entering new AgentExecutor chain...
Thought: I should generate a plan to help with this query and then copy that plan exactly to the controller.
Action: api_planner
Action Input: Find the information about xkcd comic 327. Assume an API endpoint exists like '/xkcd/{comic_number}' that returns comic details.
Observation: Plan: 1. GET /327/info.0.json to fetch information about xkcd comic 327.
Thought:I'm ready to execute the API calls.
Action: api_controller
Action Input: 1. GET /327/info.0.json to fetch information about xkcd comic 327.

> Entering new AgentExecutor chain...
Plan: 1. GET /327/info.0.json to fetch information about xkcd comic 327.
Thought: I need to construct a request to fetch the comic information using the 'requests_get' tool.
Action: requests_get
Action Input:
```json
{
 "url": "http://xkcd.com/327/info.0.json",
 "params": {},
 "output_instructions": "Extract the title, alt text, and image URL. Return them as a dictionary with keys 'title', 'alt', and 'img'."
}
```
Observation: ```json
{
  "title": "Exploits of a Mom",
  "alt": "Her daughter is named Help I'm trapped in a driver's license factory.",
  "img": "https://imgs.xkcd.com/comics/exploits_of_a_mom.png"
}
```
Thought:Thought: I have successfully fetched the comic information. I am finished.
Final Answer: {
 "title": "Exploits of a Mom",
 "alt": "Her daughter is named Help I'm trapped in a driver's license factory.",
 "img": "https://imgs.xkcd.com/comics/exploits_of_a_mom.png"
}

> Finished chain.
Observation: {
 "title": "Exploits of a Mom",
 "alt": "Her daughter is named Help I'm trapped in a driver's license factory.",
 "img": "https://imgs.xkcd.com/comics/exploits_of_a_mom.png"
}
Thought:I am finished executing a plan and have the information the user asked for.
Final Answer: xkcd 327 was titled "Exploits of a Mom". The alt text was "Her daughter is named Help I'm trapped in a driver's license factory." The image URL is https://imgs.xkcd.com/comics/exploits_of_a_mom.png

> Finished chain.
{ 'input': 'What was xkcd 327 about?', 'output': 'xkcd 327 was titled "Exploits of a Mom". The alt text was "Her daughter is named Help I'm trapped in a driver's license factory." The image URL is https://imgs.xkcd.com/comics/exploits_of_a_mom.png' }
llm>>
```

## 10.2g: CDN

## 6. Deployment

Take a screenshot of the output to include in your lab notebook. How many networks, subnetworks, and VM instances have been created?

```
brachang@cloudshell:~/networking101 (cloud-chang-brachang)$ gcloud deployment-manager deployments create networking101 --config networking-lab.yaml
The fingerprint of the deployment is b'hjdWgE-lUTaH4b2cgvfYpW=='
Waiting for create [operation-1741911438489-630425c85797b-81ddbc89-54f13477]...done.
WARNING: Create operation operation-1741911438489-630425c85797b-81ddbc89-54f13477 completed with warnings:

code: EXTERNAL_API_WARNING
message: You are creating a global DNS VM. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

code: EXTERNAL_API_WARNING
message: You are creating a global DNS VM. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

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use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

code: EXTERNAL_API_WARNING
message: Your VM is using global DNS. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

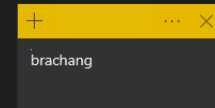
code: EXTERNAL_API_WARNING
message: Your VM is using global DNS. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

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code: EXTERNAL_API_WARNING
message: Your VM is using global DNS. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns
```



```
message: Your VM is using global DNS. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns

```

```
code: EXTERNAL_API_WARNING
```

```
message: Your VM is using global DNS. VM instances using global DNS are vulnerable
to cross-regional outages. To reduce the risk of widespread service disruption,
use zonal DNS instead. Learn more at https://cloud.google.com/compute/docs/networking/zonal-dns
```

```
NAME: asia-east1
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: asia1-vm
TYPE: compute.v1.instance
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: e1-vm
TYPE: compute.v1.instance
STATE: COMPLETED
ERRORS: []
INTENT:
```

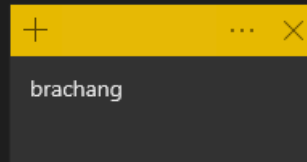
```
NAME: eul-vm
TYPE: compute.v1.instance
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: europe-west1
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: networking101
TYPE: compute.v1.network
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: us-east5
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: us-west-s1
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
```





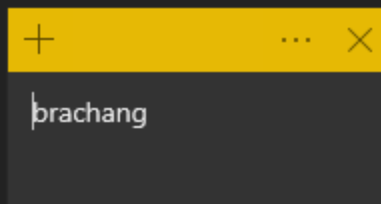
```
NAME: us-west-s1
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: us-west-s2
TYPE: compute.v1.subnetwork
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: w1-vm
TYPE: compute.v1.instance
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
NAME: w2-vm
TYPE: compute.v1.instance
STATE: COMPLETED
ERRORS: []
INTENT:
```

```
brachang@cloudshell:~/networking101 (cloud-chang-brachang) $
```



Visit the web console for VPC network and show the network and the subnetworks that have been created. Validate that it has created the infrastructure in the initial figure. Note the lack of firewall rules that have been created.

Name	Region	Stack Type	Primary IPv4 range	Secondary IPv4 ranges	IPv6 ranges	Reserved internal ranges	Gateway	Private Google Access	Flow logs
asia-east1	asia-east1	IPv4 (single-stack)	10.40.0.0/16			None	10.40.0.1	Off	Off
eu-west-1	eu-west-1	IPv4 (single-stack)	10.30.0.0/16			None	10.30.0.1	Off	Off
us-east5	us-east5	IPv4 (single-stack)	10.20.0.0/16			None	10.20.0.1	Off	Off
us-west-s1	us-west1	IPv4 (single-stack)	10.10.0.0/16			None	10.10.0.1	Off	Off
us-west-s2	us-west1	IPv4 (single-stack)	10.11.0.0/16			None	10.11.0.1	Off	Off

Visit the web console for Compute Engine and show all VMs that have been created, their internal IP addresses and the subnetworks they have been instantiated on. Validate that it has created the infrastructure shown in the initial figure.

## VM instances

Filter Enter property name or value									
<input type="checkbox"/> Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Network	Connect	
<input type="checkbox"/>	<a href="#">asia1-vm</a>	asia-east1-b			10.40.0.2 ( <a href="#">nic0</a> )	35.194.192.81 ( <a href="#">nic0</a> )	<a href="#">networking101</a>	SSH	⌵
<input type="checkbox"/>	<a href="#">course-vm</a>	us-west1-b			10.138.0.2 ( <a href="#">nic0</a> )		<a href="#">default</a>	SSH	⌵
<input type="checkbox"/>	<a href="#">e1-vm</a>	us-east5-a			10.20.0.2 ( <a href="#">nic0</a> )	34.162.166.194 ( <a href="#">nic0</a> )	<a href="#">networking101</a>	SSH	⌵
<input type="checkbox"/>	<a href="#">eu1-vm</a>	europa-west1-d			10.30.0.2 ( <a href="#">nic0</a> )	34.38.95.60 ( <a href="#">nic0</a> )	<a href="#">networking101</a>	SSH	⌵
<input type="checkbox"/>	<a href="#">w1-vm</a>	us-west1-b			10.10.0.2 ( <a href="#">nic0</a> )	34.83.39.127 ( <a href="#">nic0</a> )	<a href="#">networking101</a>	SSH	⌵
<input type="checkbox"/>	<a href="#">w2-vm</a>	us-west1-b			10.11.0.100 ( <a href="#">nic0</a> )	34.169.0.246 ( <a href="#">nic0</a> )	<a href="#">networking101</a>	SSH	⌵

Click on the ssh button for one of the VMs and attempt to connect. Did it succeed?

No

## 8. Update deployment

Take a screenshot that indicates the new rules have been deployed

networking101

OVERVIEW

SUBNETS

STATIC INTERNAL IP ADDRESSES

FIREWALLS

FIREWALL ENDPOINTS

ROUTES

VPC NETWORK PEERING

PRIVATE SERVICES ACCESS

DNS CONFIGURATION

ADD FIREWALL RULE

DELETE

Filter

Enter property name or value

Name

Enforcement order

↑

Type

Deployment scope

Rule priority

Targets

Source

Destination

Protocols and ports

Action

Security profile group

▼

vpc-firewall-rules

1

VPC firewall rules

Global

[networking-firewall-allow-internal](#)

Ingress firewall rule

Global

1000

Appl...

IPv4 range

—

tcp:0-65535  
udp:0-65535  
icmp

Allow

—

▼

[networking-firewall-allow-ssh](#)

Ingress firewall rule

Global

1000

Appl...

IPv4 range

—

tcp:22

Allow

—

▼

[networking-firewall-allow-icmp](#)

Ingress firewall rule

Global

1000

Appl...

IPv4 range

—

icmp

Allow

—

▼

## 9. Latency measurements

Given this, fill in the table with the measured latencies between the 6 pairs and include it in your lab notebook. Use the shortest latency measured for each pair.

Location pair	Ideal latency	Measured latency
us-west1 us-east5	~45 ms	64.649 ms
us-west1 europe-west1	~93 ms	134.249 ms
us-west1 asia-east1	~114 ms	116.611ms
us-east5 europe-west1	~76 ms	87.559 ms
us-east5 asia-east1	~141 ms	241.821 ms
europe-west1 asia-east1	~110 ms	261.807 ms

## 16. Test groups

**Are the instances in the same availability zone or in different ones?**

In different zones

**List all availability zones that your servers show up in for your lab notebook.**

us-east5-a

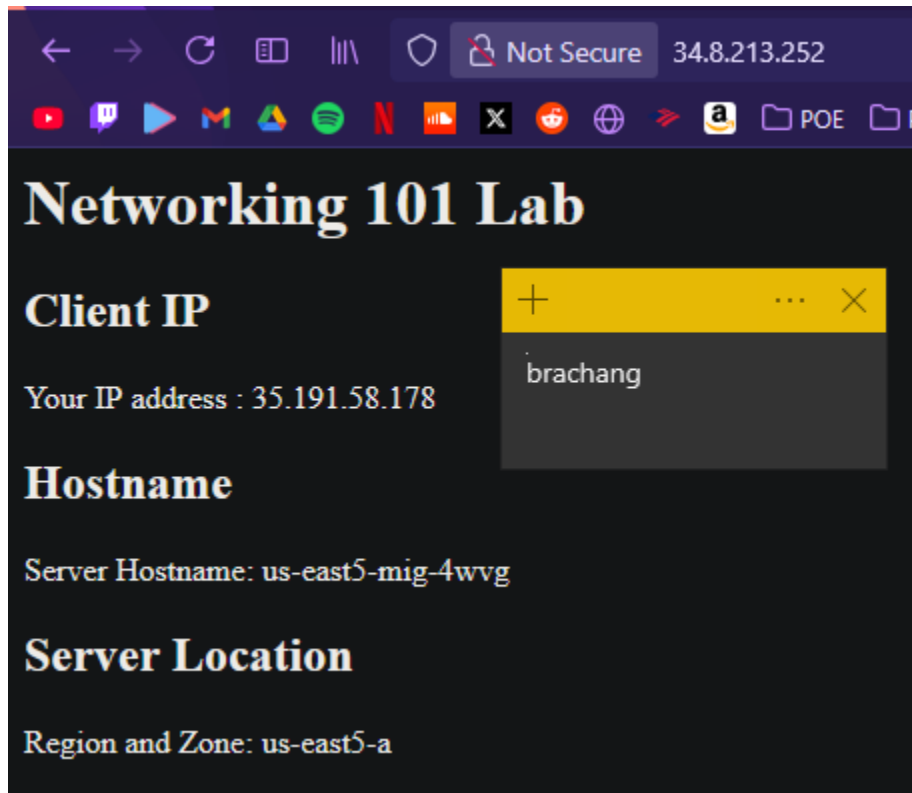
europa-west1-b

europa-west1-d

europa-west1-c

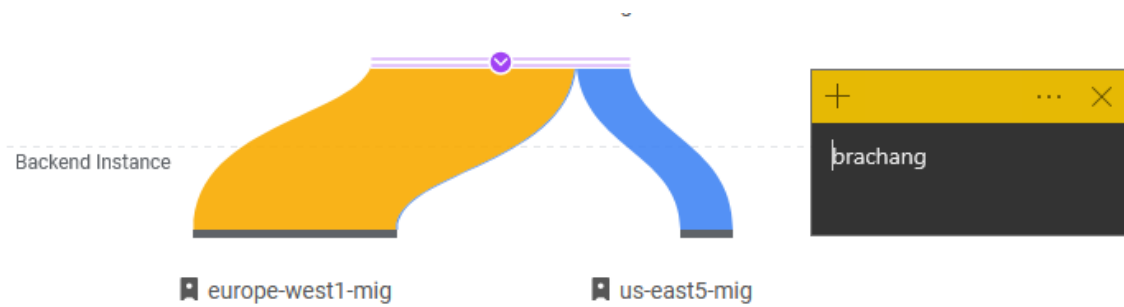
## 19. Test load balancer

**Show a screenshot of the page that is returned.**

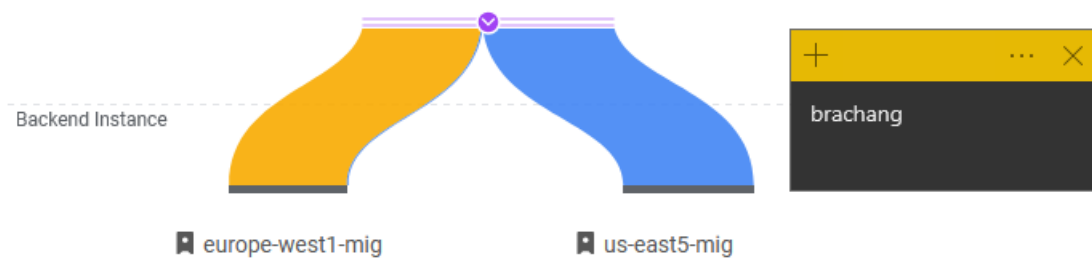


## 20. Siege! (Part 1)

**Take a screenshot of the initial traffic distribution**



**Take a screenshot of the UI as additional instances are brought up and show that the traffic distribution shifts**



## 21. Siege! (Part 2)

**Show a screenshot of the final traffic distribution.**

