Through The Clouds:
An Introduction to Cloud Computing

Day 4: Projects & Wrap Up!

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Yale

Today’s Agenda

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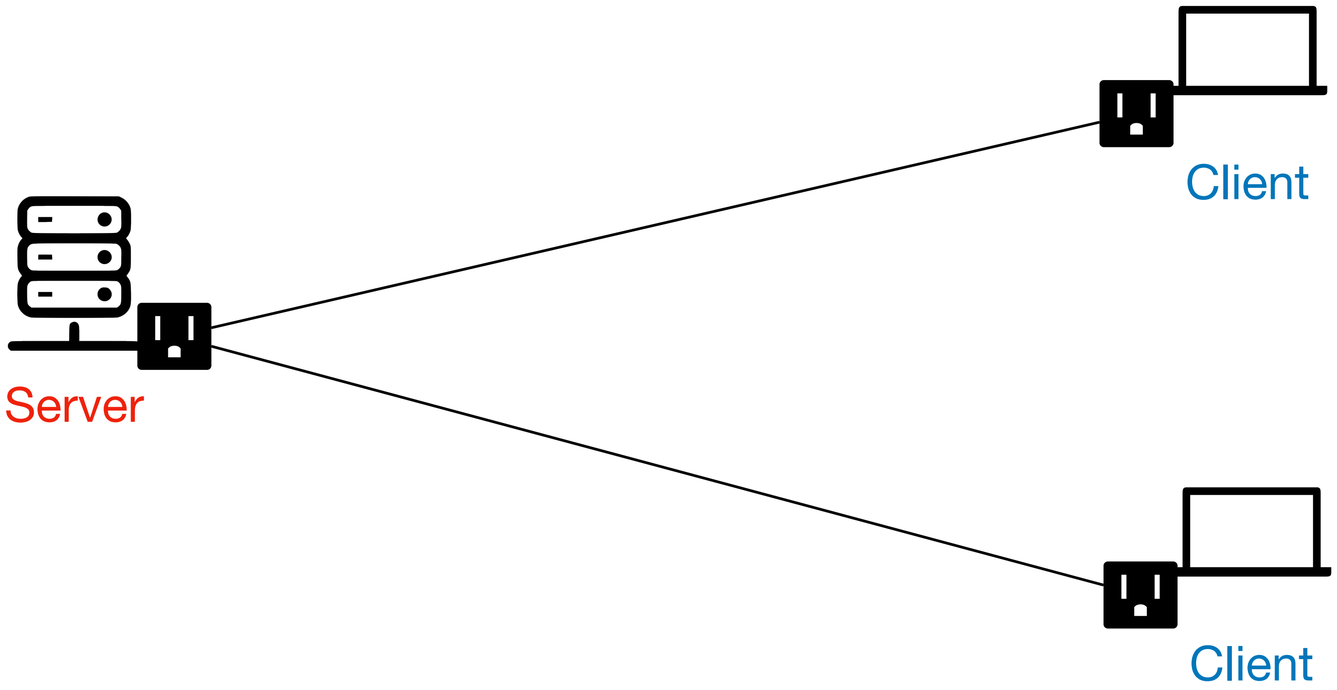
- Wrap up the chat application!
  - Client Registry
  - Instant Message
- What more do cloud applications have to worry about?

Demo & Coding

Final Step: Instant message!



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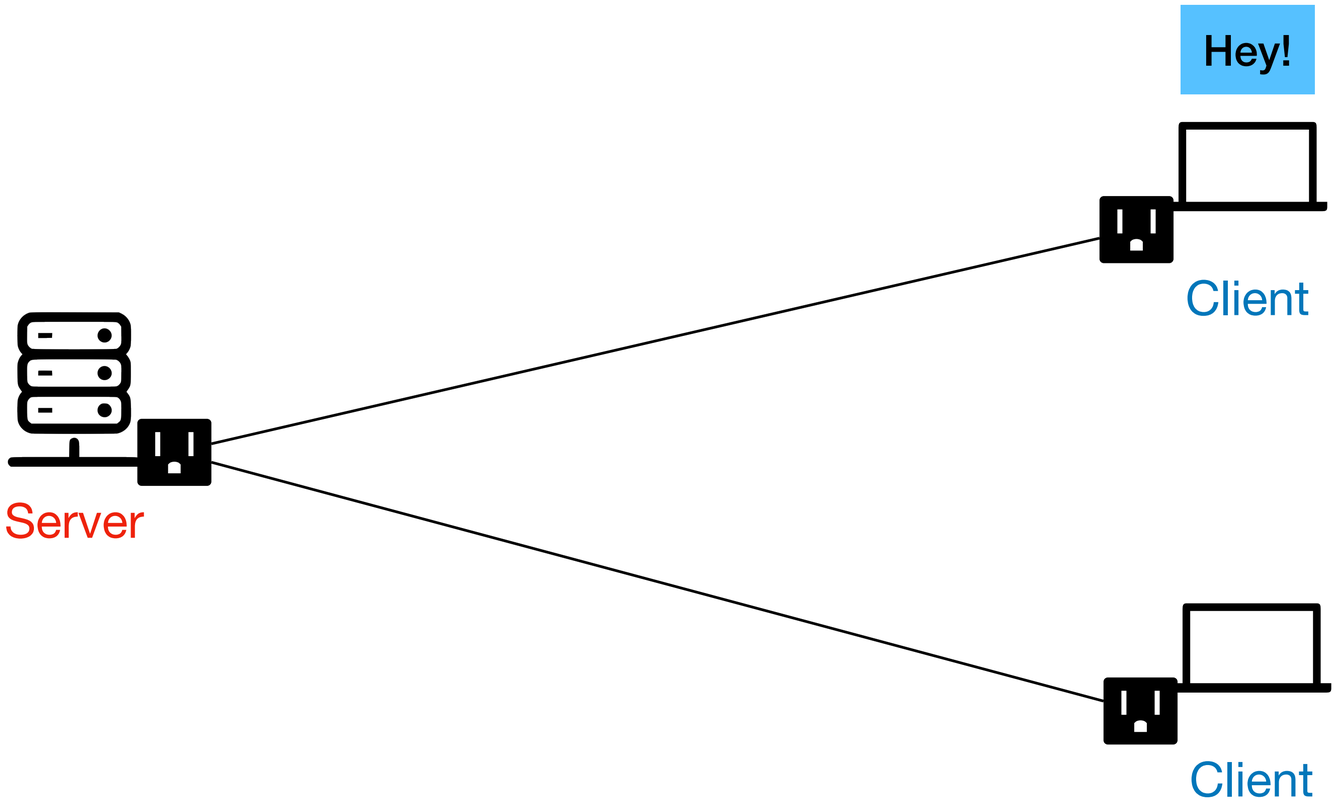

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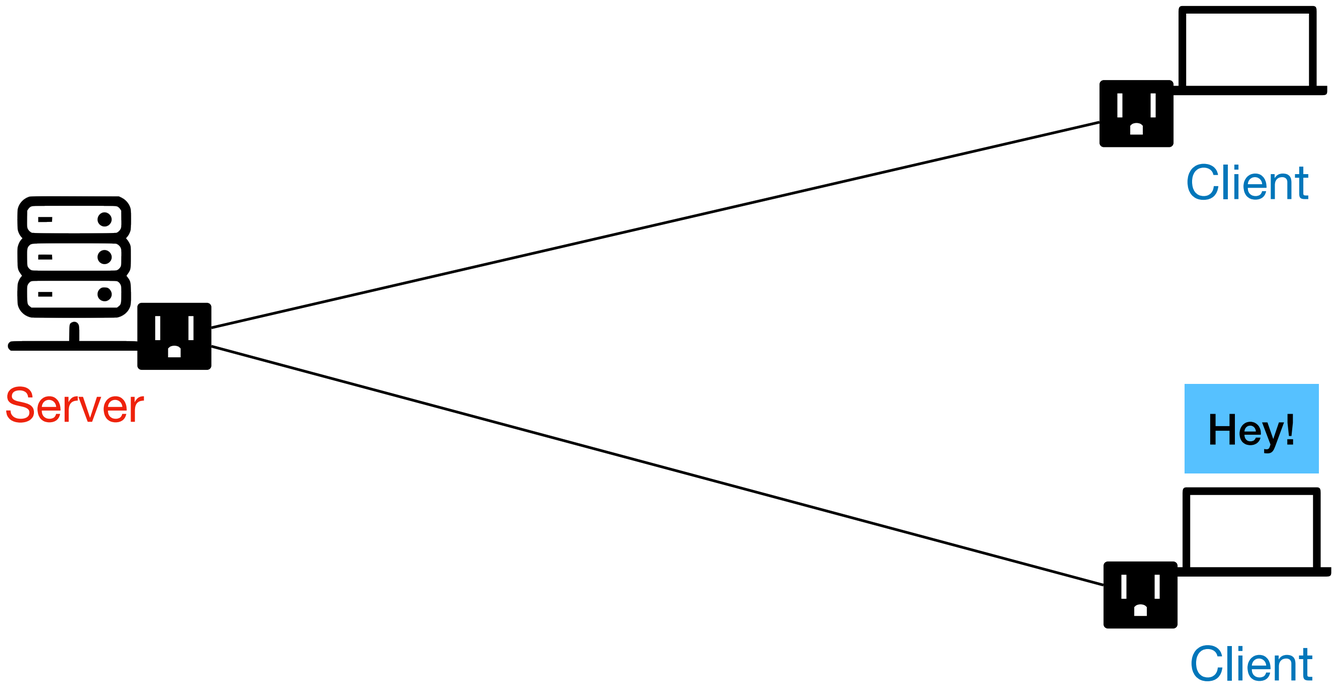

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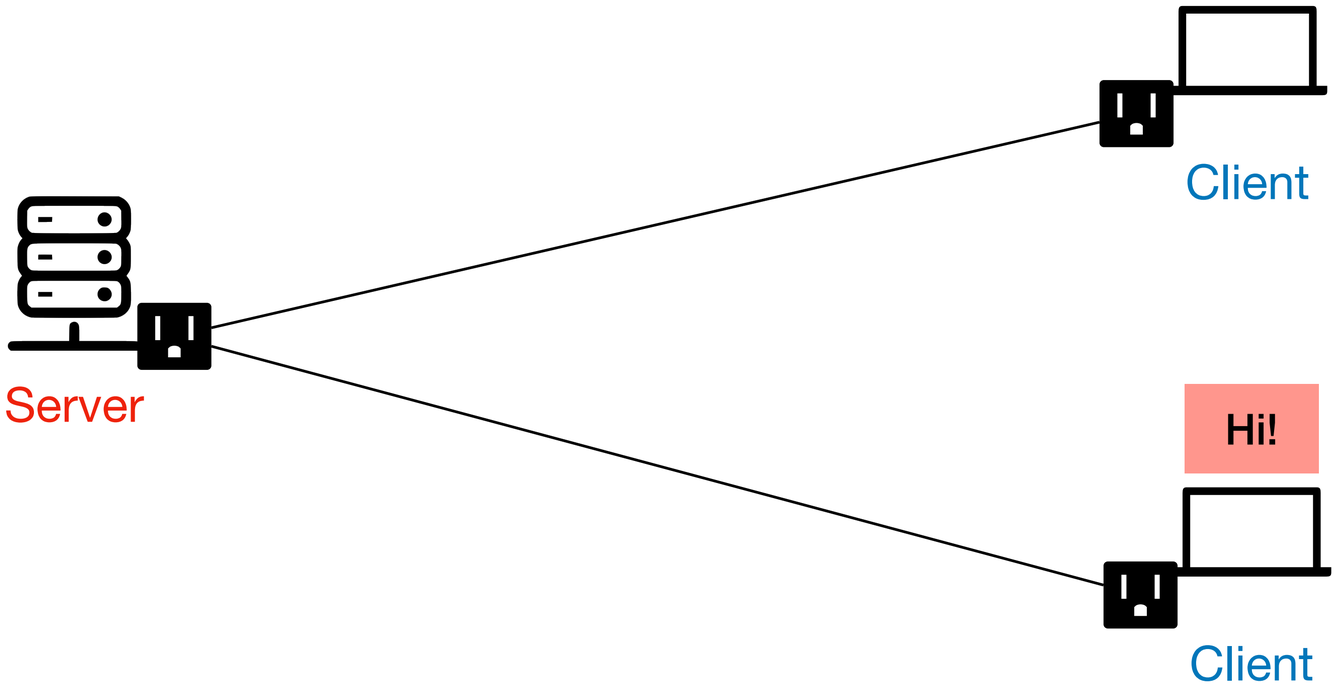

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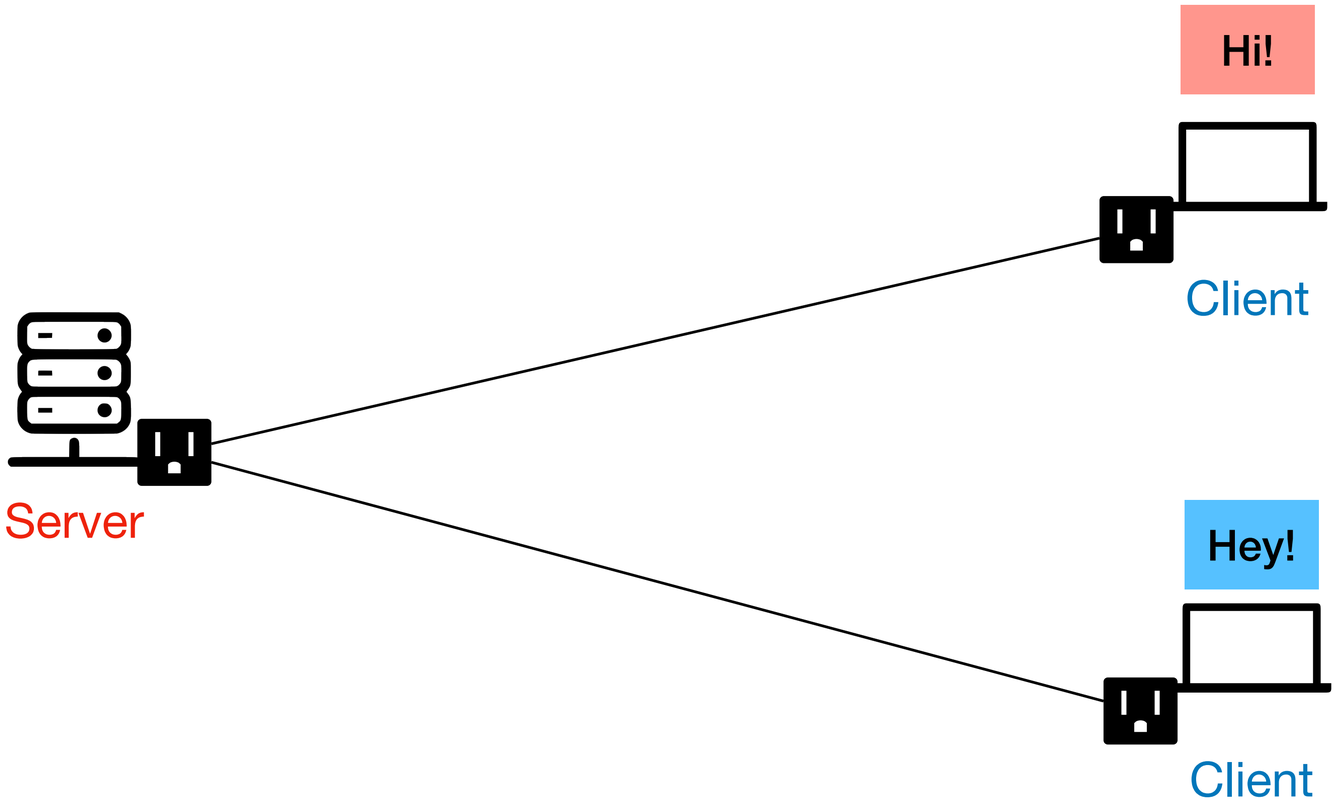

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- The functions you have to edit:
- In server_logic.py:

```
async def forward_message_to_client(server, receiver_username, msg):
  # your code here
```

- Helper functions:
  - `server.logged_in()` returns true if the sending client has already logged in
  - `server.user_is_logged_in(username)` returns true if a client with `username` is logged in

How do you test it?

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- Open **three** terminals
- Go to the directory where the code resides (`client_registry`) on all terminals

  `cd /path/to/client_registry` (on Linux & MacOS)
  `cd \path\to\client_registry` (on Windows)

- On one terminal, run the server:

  ```
  python3 server.py
  ```

- On the other two terminals, run two clients:

  ```
  python3 client.py
  ```

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- Open **three** terminals
- Go to the directory where the code resides (`pingpong2`) on all terminals

  `cd /path/to/pingpong2` (on Linux & MacOS)
  `cd \path\to\pingpong2` (on Windows)

- On one terminal, run the server:

  ```
  python3 server.py
  ```

- On the other two terminals, run the clients:

  ```
  python3 client1.py
  python3 client2.py
  ```

Demo & Coding

You’re Done!

Any Questions?

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- Try implementing the harder client_registry2.0
  - Server-side logic to handle the set of users that are registered/logged in
- Think about how to implement a group chat feature
  - How do you add users to a group chat?
  - How do you forward a message from one user to all?
  - Any other challenges?
  - Try implementing it! (Use instant_message as a starting point)

What haven’t we considered?

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  - Distributed computing!

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  - Create multiple copies of data across multiple computer

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  - Not safe or secure!
- Need mechanisms to ensure access to data is *authenticated,* i.e., can access only if I have the password
- Need mechanisms to ensure data communications are *secure,* i.e., no one else can see what my network traffic contains (e.g., using *encryption*)

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Any Questions?

Thank you!

I hope you will consider a career in Cloud Computing! :)