

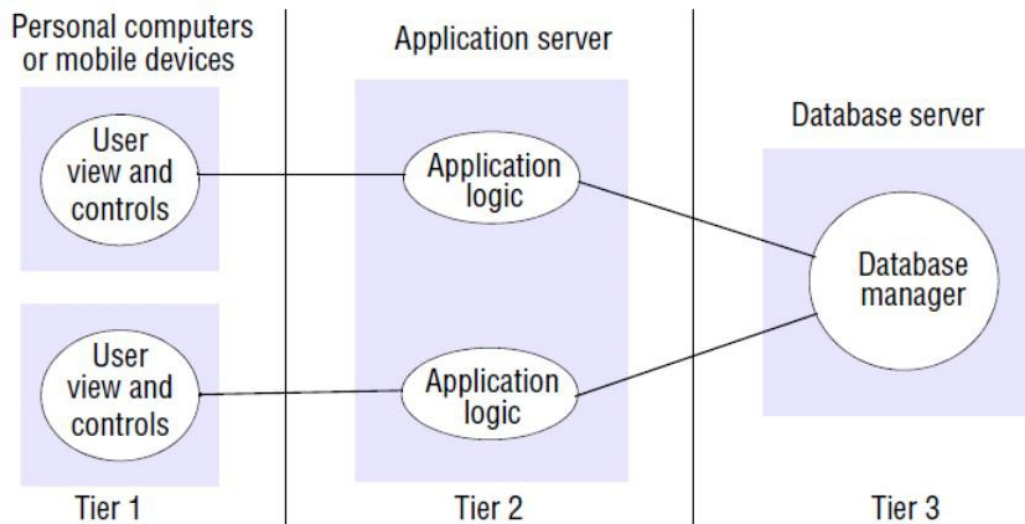
COMP7940 Cloud Computing

Group Project Milestone 4

15 April 2020

1. How is your project architecture related to the theory taught in the lecture?

The chat-bot can be view as three tier architecture:



Firstly: Presentation logic: handling user interaction and updating the view of the application as presented to the user (Line messenger: chat-bot);

Second: Application logic: concerned with the detailed application specific processing (Heroku server);

Third: Data logic: concerned with the persistent storage of the application, such as a database management system (Heroku database, Heroku Redis, Redis database and Heroku PostgreSQL).

2. Can you demonstrate, with some screen cap, how to increase capacity of your chat bot service?

The LINE Bot is currently built on Heroku, which like other cloud providers prices at “pay-as-you-go”. Specifically, the resources of Heroku is measured in terms of dynos, which are Linux lightweight containers. Scaling up is achieved by purchasing dynos, if the free dynos associated in the account are not enough. For example, if there are more users subscribed to the LINE Bot account and talk to it, there will be more

concurrent HTTP requests, and thereby generate greater traffic volume. In such as case, more web dynos should be purchased.

The Line Bot currently has a few functions, including the query of a PostgreSQL database which stores location details of hospitals in Hong Kong, and query of Redis database, which a web scraper will periodically update with the latest number of confirmed, discharged, hospitalized and death cases in Hong Kong.

The service for PostgreSQL is provided by Heroku PostgreSQL, which divides its services into various plans. Basically, fees will be charged if there are more connections (i.e. number of users of the LINE bot acquires) and more instances that the database will store. Heroku PostgreSQL does provide scale up options, one simply subscribes the different charging plans, based on anticipated usage. The following is a screen cap for different plans and the simplicity of the scaling by only clicking the right plan and install:

The screenshot displays the Heroku PostgreSQL pricing and configuration interface. On the left, a sidebar lists various pricing plans, with 'Hobby Dev' highlighted as the selected plan. The main content area details the features and limits for the selected plan, including Postgres Extensions, RAM, Database Forks, Direct SQL access, Row Limit (10,000), Storage Capacity, Database Followers, Dataclips, Continuous Protection, Connection Limit (20), High Availability, Rollback, Encryption at Rest, PostGIS, PGBackups, and Heroku Private Spaces. The right sidebar provides links for installation, quick links, shareable details, add-on category, and language support.

Plan	Price
Hobby Dev	Free
Hobby Basic	\$9/mo
Standard 0	\$50/mo
Standard 2	\$200/mo
Premium 0	\$200/mo
Private 0	\$300/mo
Premium 2	\$350/mo
Shield 0	\$350/mo
Standard 3	\$400/mo
Private 2	\$600/mo
Shield 2	\$750/mo
Premium 3	\$750/mo
Standard 4	\$750/mo
Private 3	\$1000/mo
Shield 3	\$1200/mo
Premium 4	\$1200/mo
Standard 5	\$1400/mo
Private 4	\$1500/mo
Shield 4	\$1800/mo
Standard 6	\$2000/mo

Postgres Extensions

RAM 0 Bytes

Database Forks

Direct SQL access

Row Limit 10,000

Storage Capacity

Database Followers

Dataclips

Continuous Protection

Connection Limit 20

High Availability

Rollback

Rollback 0 Seconds

Encryption at Rest

PostGIS

PGBackups

PGBackups Retained 2 Backups

Heroku Private Spaces

Burstable Performance

Heroku Postgres via PrivateLink

Install Heroku Postgres

QUICK LINKS

- Add-on Details
- Region Availability
- Plans & Pricing
- Documentation

SHAREABLE DETAILS

- Shareable Across Apps
- Multiple Installs/App

ADD-ON CATEGORY

Data Stores

LANGUAGE SUPPORT

- CLOJURE
- GO
- JAVA
- NODE
- PHP
- PYTHON
- RUBY
- SCALA

In anticipating the growth in data storage given more and more countries are affected by the pandemic and people may be interested in not only the data in Hong Kong, but also that in overseas, the use of other database service is an effective way of scaling-out. And this is done by way of installing the add-on Heroku Redis.

Similar to PostgreSQL, the service for Redis is provided by Heroku Redis, which also divides its services into various plans. Basically, fees will be charged if there are more connections (i.e. number of users of the LINE bot acquires) and the memory consumed. It can be equally easy to scale up by subscribing charged plans, based on anticipated usage. The following is a screen cap for different plans and the simplicity of the scaling by only clicking the right plan and install:

The screenshot displays the Heroku Redis service page. On the left, a list of plans is shown, ranging from 'Hobby Dev' (Free) to 'Private 14' (\$14000/mo). The main content area shows the details for the 'Hobby Dev' plan, including 25 MB memory and a connection limit of 20. A red box highlights the 'Memory' and 'Connection Limit' fields. Below this, there's a terminal snippet showing the command 'heroku addons:create heroku-redis:hobby-dev'. The right sidebar contains quick links, shareable details, and language support options.

[Any scaling of other services??]

3. Can you identify if you bot is one of the example of PaaS, IaaS, SaaS? Explain your answer.

The LINE bot is purely implemented on Heroku platform. Although Heroku is known to be a PaaS platform, other services are subscribed to the Heroku services, including Redis and PostgreSQL. So basically, the control of the operating system and middleware components of the LINE bot is rest with Heroku. This essentially lets Heroku be the SaaS service provider. However, when we implement some more other services from other sources, Heroku becomes back to PaaS. All in all, Heroku is a cloud-based, platform-as-a-service (PaaS). So is our chat-bot.

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