Cloud Computing-Milestone4

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

In a distributed system, processes, objects, components and services interact with each other and take different roles and responsibilities, and there are two popular architectural styles: Client-Server and Peer-to-Peer. For our chatbot, we consider it as a Client-Server Model. Client processes interact with individual server processes in a separate computer in order to access data or resource, and the users act like client. When they send messages to the chatbot, they request for some feedback about the information of coronavirus. The server, however is the redis in our chatbot, would match the keyword which sent by users to the data in the redis, and send back the correlated information to the users.

However, when we using the redis to store the permanent data, it needs to use the redis's host, password and port. The so-called port is like a house number. The client can find the corresponding server side through the IP address, but the server side has many ports. Each application corresponds to a port number. Through the port number, the client can actually access the server. In order to distinguish the ports, each port is numbered, which is the port number.

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

When the number of users increase, or each user use it more frequently, we can scale out in the heroku platform to increase the capacity of our chatbot. Heroku apps can be scaled to run on multiple dynos simultaneously (except on Free or Hobby dynos). Dynos are the heart of heroku platform. The Heroku Platform uses the container model to run and scale all Heroku apps. The containers used at Heroku are called "dynos." Dynos are isolated, virtualized Linux containers that are designed to execute code based on a user-specified command. Your app can scale to any specified number of dynos based on its resource demands. Heroku's container management capabilities provide you with an easy way to scale and manage the number, size, and type of dynos your

app may need at any given time. We can scale your app's dyno formation up and down manually from the Heroku Dashboard or CLI.

(1) In the Heroku dashboard:

We can choose different dyno types in the resources, depends on the application types. From small prototypes to the production apps even enterprise-grade applications.
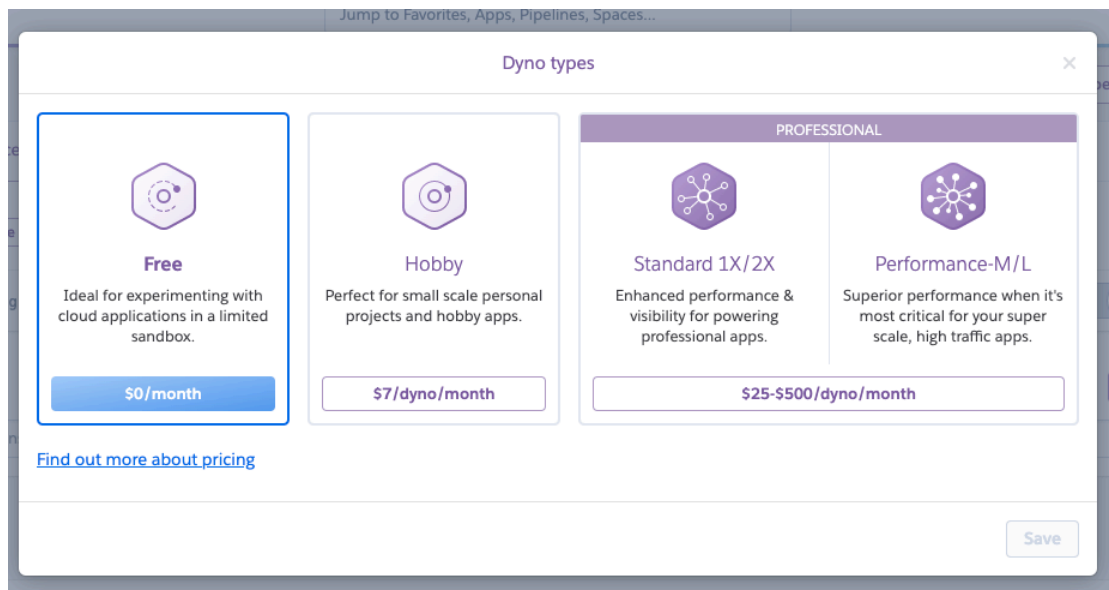
(2) In the Heroku CLI

It's just an example I failed to scale out because I didn't pay for the Heroku

Actually, many company like Amazon, Alibaba has provided the elastic compute cloud service. The processing power of amazon's elastic computing cloud can be increased or decreased in real time, as little as the processing power of one virtual machine and as much as the processing power of more than 1,000 virtual machines. The elastic computing cloud is paid according to its computation and network resources consumed. Rapid elasticity allows us to scale out or in quickly. It requires the organizations have the ability to quickly response to the changes or usage fluctuations, even predict it. In the Heroku platform, we scale out the capacity of our chatbot by increase the number of dynos. It's the horizontal scaling. It will open more instance, not increasing the computation power. There is another one called vertical scaling, which will increase

the computation power. The horizontal scaling is less expensive and not limited by hardware capacity. Take the Dingding (an Intelligent office platform offered by Alibaba) for example. In the early Feb, due to the resumption of work, Dingding background system traffic came to an unprecedented peak, through the continuous expansion of more than 100,000 cloud servers in ali cloud, Dingding smoothly through the peak flow. Based on the flexible computing resource scheduling and scheduling service of Aliyun, Dingding deployed more than 10,000 cloud servers in just 2 hours, setting a new record for the rapid expansion of Aliyun. In addition, Aliyun has 2500 CDN nodes and 120T bandwidth all over the world, which also provides support for group live broadcasting and video conferencing.

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

IaaS (Infrastructure as a Service) is infrastructure as a service, referring to a service model that provides IT infrastructure as a service to the outside world and charges the user based on the actual usage or occupancy of resources.

SaaS (Software-as-a-Service) means software as a service, that is, providing software services through the network. SaaS platform suppliers deploy application software on their own servers. Customers can order the application software services they need from the Internet.

PaaS (Platform as a Service) refers to platform as a service, taking the server platform as a service providing business model, the service provided by the program through the network is called SaaS, and the corresponding server platform or development environment in the cloud computing era provided as a service to become PaaS Platform as a Service.

With the comparison of IaaS, SaaS, PaaS, for our chatbot, we deployed the python code to Heroku and test the chatbot, however the heroku belongs to PaaS, because it helps to build applications and bring them to the world without worrying about managing servers, expanding operations or handling deployment processes. Besides, the chatbot is working on the platform of LINE, and LINE belongs to the SaaS. For SaaS, the development, management, and deployment of application are all handed over to the third parties, without caring about technical issues and can be used immediately. The

Internet services that common users are accessed to are almost all SaaS, including the social application LINE.

For chatbot itself, it belongs to SaaS service, because:

(1) Users mainly interact with front-end interface of our chatbot to obtain relevant services, such as asking for the address to buy the mask and get the knowledge about the epidemic, and has very limited administrative control.

(2) SaaS service provides users with the ability to use the applications of cloud service providers running on the cloud infrastructure. The developers use heroku, which is one of PaaS service, to deploy application code and store the data in the redis database. The users do not need to manage or control the underlying cloud infrastructure, including network, server, operating system, storage or even individual application functions.

SaaS products provide software services to users through the Internet. With the progress of Web Technology (such as jQuery and node. JS), the interaction experience of web pages is greatly improved, and the interaction is smoother and more user-friendly.