System Architecture for Microservice

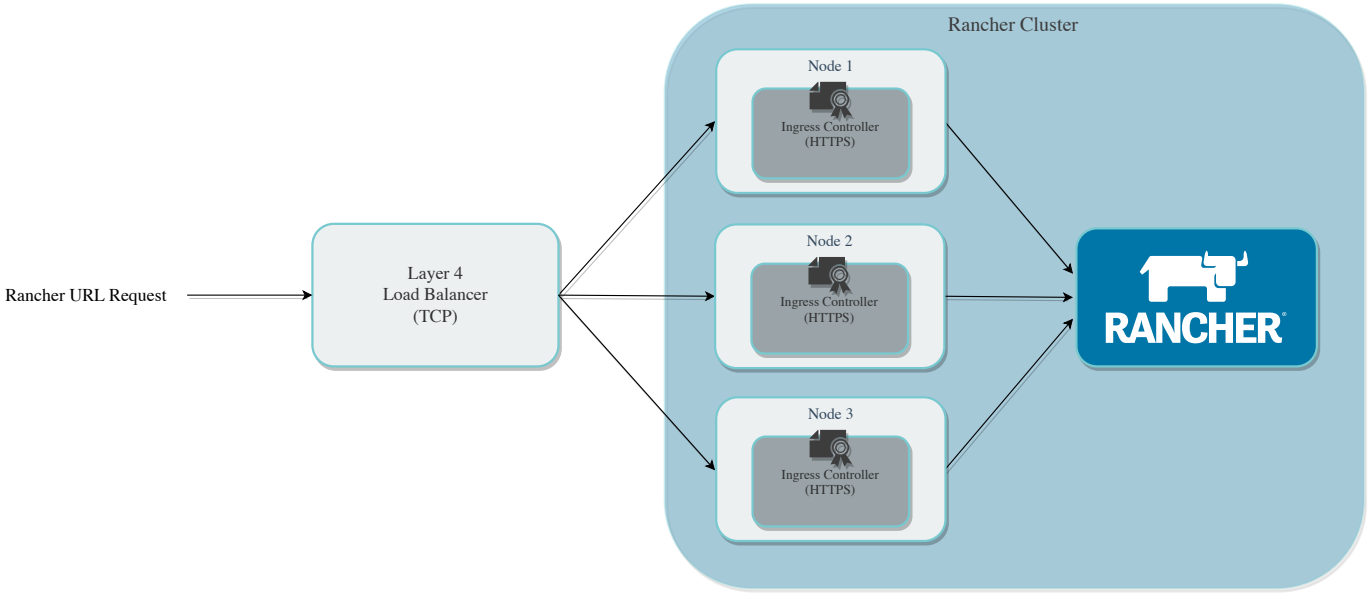
> This topic is foucus on the Microservice System Architecture on Aliyun and On-permise Data Centre
>
> And noticed that the price model on aliyun is folating and some serive is alway on-demand which only can estimate as a range rather than a given price monthly.

1. On-permise System Architecure

> Since we need a HA kubernetes at on-permise environment, only using kubernetes is not good enough, which you will spend lots of time on maintenance and operation with kubernetes; So Rancher (2.x) is a good option for enterprise internal usage;

1.1 Recommended Architecture

- Rancher's DNS should resolve to Layer 4 (TCP) load balancing. Using NGINX~
- Load balancing should forward port TCP / 80 and TCP / 443 to all 3 nodes in the Kubernes cluster.
- Ingress-controller redirects HTTP to HTTPS and terminates SSL / TLS on port TCP / 443 (SSL digital certificate deployed here).
- Ingress-controller forwards traffic to the TCP / 80 port of the POD.



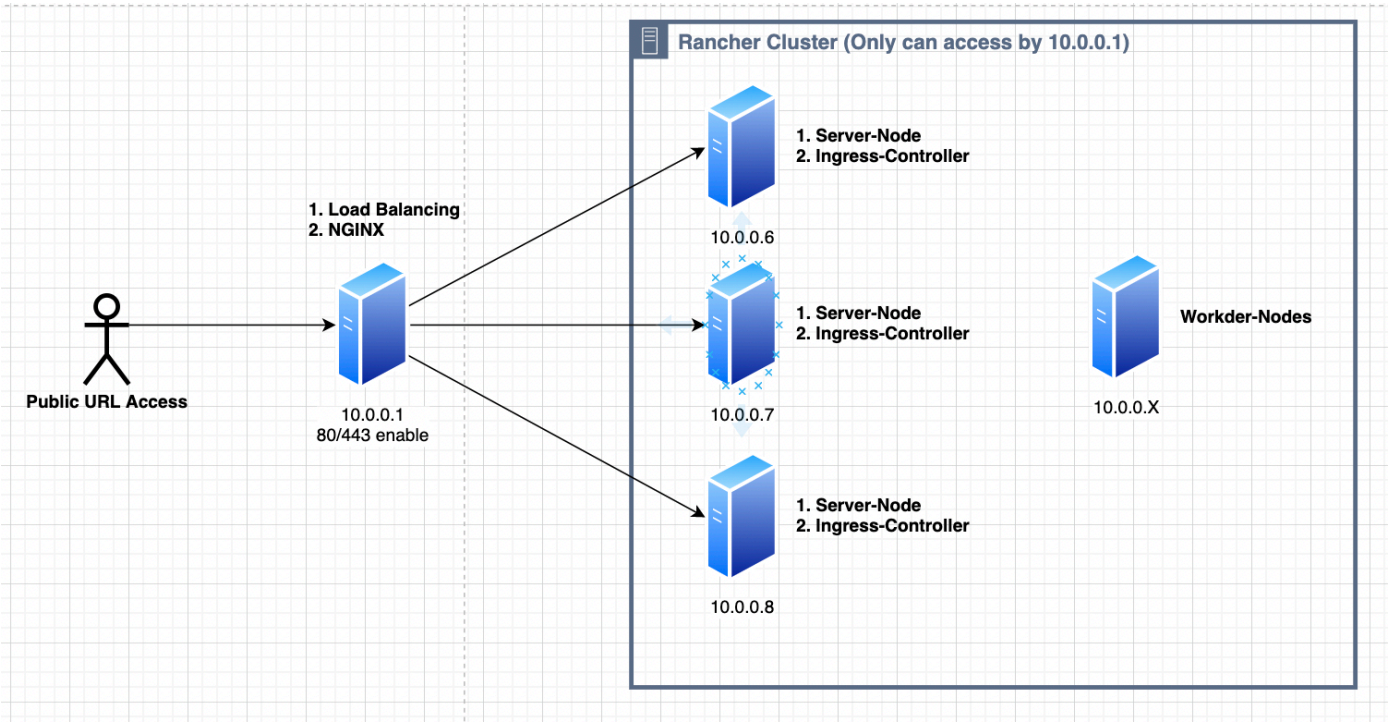
1.2 Recommended Servers:

- **One** Linux server, using for four-layer load balancing;
- **Three** Linux servers, Rancker-Server-Node nodes;
- **N** Linux servers, Rancker-Agent-Node node (n <= 50);

1.3 VM System Specifications:

NODE	IP	VM System Sepcification	Notes	Ports
NODE-LB	10.0.0.1	ubuntu 18.04(64-bit x86) / 4 vcpu / 8 g / 100G Storage Disk or other Linux	Load Balancing	80/443
NODE-SERVER-1	10.0.0.6	ubuntu 18.04(64-bit x86) / 4 vcpu / 8 g / 100G Storage Disk or other Linux	Rancher master node 1	open all for this VPC, close all for external
NODE-SERVER-2	10.0.0.7	ubuntu 18.04(64-bit x86) / 4 vcpu / 8 g / 100G Storage Disk or other Linux	Rancher master node 2	open all for this VPC, close all for external
NODE-SERVER-3	10.0.0.8	ubuntu 18.04(64-bit x86) / 4 vcpu / 8 g / 100G Storage Disk or other Linux	Rancher master node 3	open all for this VPC, close all for external
NODE-WORKER-(1~3)	10.0.0.16 ~ 18	ubuntu 18.04(64-bit x86) / 4 vcpu / 8 g / 100G Storage Disk or other Linux	Worker nodes	open all for this VPC, close all for external

1.4 Detail System Architecure



2. Aliyun's K8s - (for one k8s in Aliyun - HK Region)

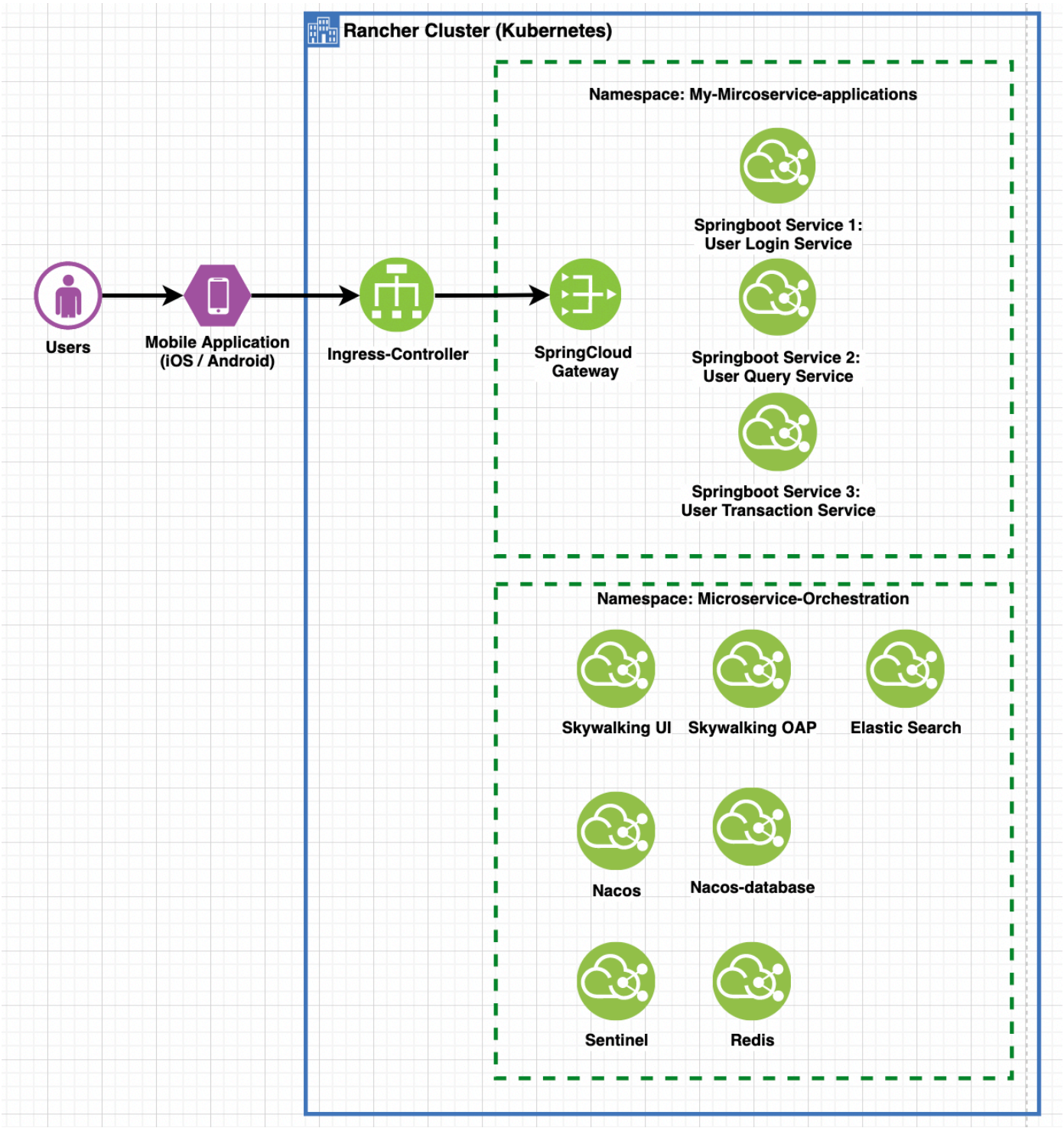
Cloud Service	Cloud Service Specificaiton	Pirce - Monthly	Qty
AliCloud Managed Kubernetes	Kubernetes Version - 1.20.4-aliyun.1 Docker 19.03.15 Flannel Networking	67.5 USD	1
Elastic Cloud Computing Service - Worker Nodes	ecs.hfc6.xlarge (4vCPU, 8GiB) 120 GB Disk Storage	407.94 USD	3
SNAT - Load Balanceing Service	slb.s2.medium and networking is demanding	Service is 0.319 per/hour ; Networking is 0.156/GB; So the total month is 81.75 USD + 0.156/GB	1
Ingress - Load Balanceing Service	slb.s2.medium and networking is demanding	Service is 0.319 per/hour ; Networking is 0.156/GB; So the total month is 81.75 USD + 0.156/GB	1
Total Price	**638.84 USD + Networking Price**	**Networing Price os 0.156*2 = 0.312 USD per/GB**	

> **If Choose fixed 5 Mbps Bandwidth: The networking price can be estimated 104.25USD per month per Load Balanceing**

k8s already can be regraded as a basic service on aliyun platform, with the development of Cloud Native Concept, there are some other recommended tools:

- EDAS: https://help.aliyun.com/product/29500.html?spm=a2c4g.11186623.3.2.19693c103LVjsy
- MES: https://help.aliyun.com/product/123350.html

3. Microservice Applications


Rancher Cluster (Kubernetes)
Namespace: My-Mircoservice-applications
Springboot Service 1:
User Login Service
Springboot Service 2:
User Query Service
Springboot Service 3:
User Transaction Service
Users
Mobile Application
(iOS / Android)
Ingress-Controller
SpringCloud
Gateway
Namespace: Microservice-Orchestration
Skywalking UI
Skywalking OAP
Elastic Search
Nacos
Nacos-database
Sentinel
Redis

Namespace	Docker Image Name	Ports	Notes
Mircoservice-Orchestration	nacos/nacos-server	8848, 9848, 9849	configuration and service registration center
Mircoservice-Orchestration	nacos/nacos-mysql:5.7	3306	persist data of nacos
Mircoservice-Orchestration	redis:latest	6379	for distribution lock usage
Mircoservice-Orchestration	bladex/sentinel-dashboard:1.8.0	321000	Flow Control
Mircoservice-Orchestration	apache/skywalking-oap-server:8.5.0-es7	11800, 12800	data collector
Mircoservice-Orchestration	apache/skywalking-ui:8.5.0	8000	Applicaiton Trace & Monotroing
Mircoservice-Orchestration	elasticsearch:7.5.1	9200,9300	persist data of skywalking