SuperVessel: The Open Cloud Service for OpenPOWER

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Why SuperVessel Cloud

Motivation: To grow the number of developers on OpenPOWER in the world

- Freely opened to all the students in universities, individual developers and ecosystem partners for OpenPOWER.
- Built on the POWER7/POWER8 resource pool
- Built with open technologies, such as OpenStack
- Support advanced technology services, e.g. Docker service, big data service, cognitive computing service
Service Roadmap of SuperVessel

Super Marketplace

(Online)
SuperVessel Cloud Service
1. VM and container service
2. Storage service
3. Network service
4. Accelerator as service
5. Image service

(Online)
SuperVessel Big Data and HPC Service
1. Big Data service:
   MapReduce (Symphony), SPARK
2. Performance tuning service

OpenPOWER Enablement Service
1. X-to-P migration
2. OpenPOWER new system test service

(Online)
Super Class Service
1. On-line video courses
2. Teacher course management
3. User contribution management

(Preparing)
Super Project Team Service
1. Project management service
2. DevOps automation

SuperVessel Cloud Infrastructure

Storage
IBM POWER servers
OpenPOWER server
FPGA/GPU

OpenPOWER

Docker

KVM
Architecture of SuperVessel Cloud

OpenPOWER-SuperVessel Unified Management Platform

Cloud Infrastructure Service

Big Data Service

OpenPOWER enablement service

Super Class service

Super Project Service

Services for cloud admin

System maintenance

System monitoring

Image management

Resource usage metering

System analysis

Baremetal management

- OpenStack controller
  - Horizon
  - HEAT
  - Nova
  - Glance
  - Cinder
  - Neutron

- KVM
  - Nova
  - Neutron
  - Cinder
  - KVM pool for POWER8 LE

- KVM
  - Nova
  - Neutron
  - Cinder
  - KVM pool for POWER8 BE

- LxC/Docker
  - Nova
  - Neutron
  - Cinder
  - Container pool for POWER8 LE
  - Container pool for POWER8 BE

- LxC/Docker
  - Nova
  - Neutron
  - Cinder
  - GPFS

- KVM
  - Nova
  - Neutron
  - Cinder
  - KVM pool for x86

OpenPOWER server

FPGA/GPU

IBM Cloud Management

GPFS
To expand the SuperVessel via collaboration with OpenPOWER partners

- Multi-site design: Using the multi-region in OpenStack to support multi-site management of SuperVessel cloud.
- We are designing the first multi-site for Jiangsu Development and Test cloud on POWER
  - Shared dashboard, Shared keystone, Shared object store (in future)
  - Enhance the cache design for performance optimization
  - Enable the regional administration
SuperVessel Cloud Services

- Virtual machine and Docker services
- VPN management
- Pre-installed image service
- Multi-site support will be provided in next step

We use virtual points for resource management
SuperVessel Cloud Services

- Pre-installed image service: It could very much make user easier to start development on POWER
  - Docker is used to provide the pre-installed environment.
SuperVessel Big Data Services

- Support MapReduce and SPARK services
- Allow user to request different size of cluster
Shared file system for Cloud and Big Data service

- HEAT will orchestrate docker instances, subnet and data folder based on user’s request
- Manila provides the NFS service using GPFS as backend, and the folder will be mounted via nova-docker (with \(-v\) support)
- Folder created by Manila could be accessed by the KVM/docker instances created for big data and other purpose
SuperVessel Accelerator as Service

- Accelerator MarketPlace for developers to upload and compile the accelerators for SuperVessel POWER cloud
- Allow user to request different size of cluster

Fig. 1 Accelerator MarketPlace for SuperVessel Cloud

Fig. 2 Cloud users could apply accelerator when creating VM
Developer quickly grew in the past 100 days

- Users from 30 universities
  (including 3 from US)
- 6 university joint research projects
- Supported several courses from universities, e.g.
  - The Big Data course of Beijing Institute of Technology: 100 students with 38 big data clusters
  - The virtualization technology course from University of Delaware (US)

Our target is 100,000 users and 100 universities in 2015/2016.
Thank You !!

Call for your collaboration to build this CLOUD together

www.ptopenlab.com