

ABSTRACT

The rapid development of the cloud computing and big data processing technology has great potential to improve the data transmission and processing activities in CTBT verification system. The distributed Cloud Data Center, which is based on Openstack platform, with the innovation of open, hardware and software decoupling and software defined network, can realize hardware resource pooling, software architecture distribution and operation automation. It can increase the IT resource utilization and ensure the service continuity. At the same time, based on Convergent Video Conference System, it can support the attendees from different departments and different locations, to share voice, data and video by any type of terminal (conference rooms, tablets, web pages, mobile phones, etc.). The collaboration and management efficiency can be improved significantly. Moreover, the blue-ray based storage system with long-life - 50 years - used in the data centers improves the data reliability greatly. Related technologies and their possible application in the CTBT verification system are discussed in this paper.

BACKGROUND

- IT Systems are moving to Private Cloud rapidly and there are several trends in development of Private Cloud.
- ✓ Network services become mature as IaaS services develop.
 - ✓ Most private clouds support OpenStack.
 - ✓ Developers at different levels require increasingly demanding self-help services.
 - ✓ Private clouds can easily connect to public clouds for unified management.
 - ✓ Suppliers can provide higher levels of services.

With this background, a two phase migration approach of IT system is suggested to apply the cloud computing in a data center:

Phase 1, Unified network, which include

- 1)Unified presentation & monitoring for global resources
- 2)Unified maintenance for heterogeneous devices
- 3)Early-warning for proactive O&M
- 4)Root analysis for mass warning

Phase 2, Unified management, which include

- 1)Unified Overlay network with VxLAN
- 2)Unified management for virtual & physical network
- 3)Automatic services deployment across resource pool

USE OF CLOUD DATA CENTER AND DATA LAKE

Cloud Data Center

A distributed Cloud Data Center is designed and applied to a Simulated National Data Center (SNDC) to test the system function and efficiency based on Huawei Cloud. To ensure the reliability of the cloud services, a disaster recovery module is imbedded in the system.

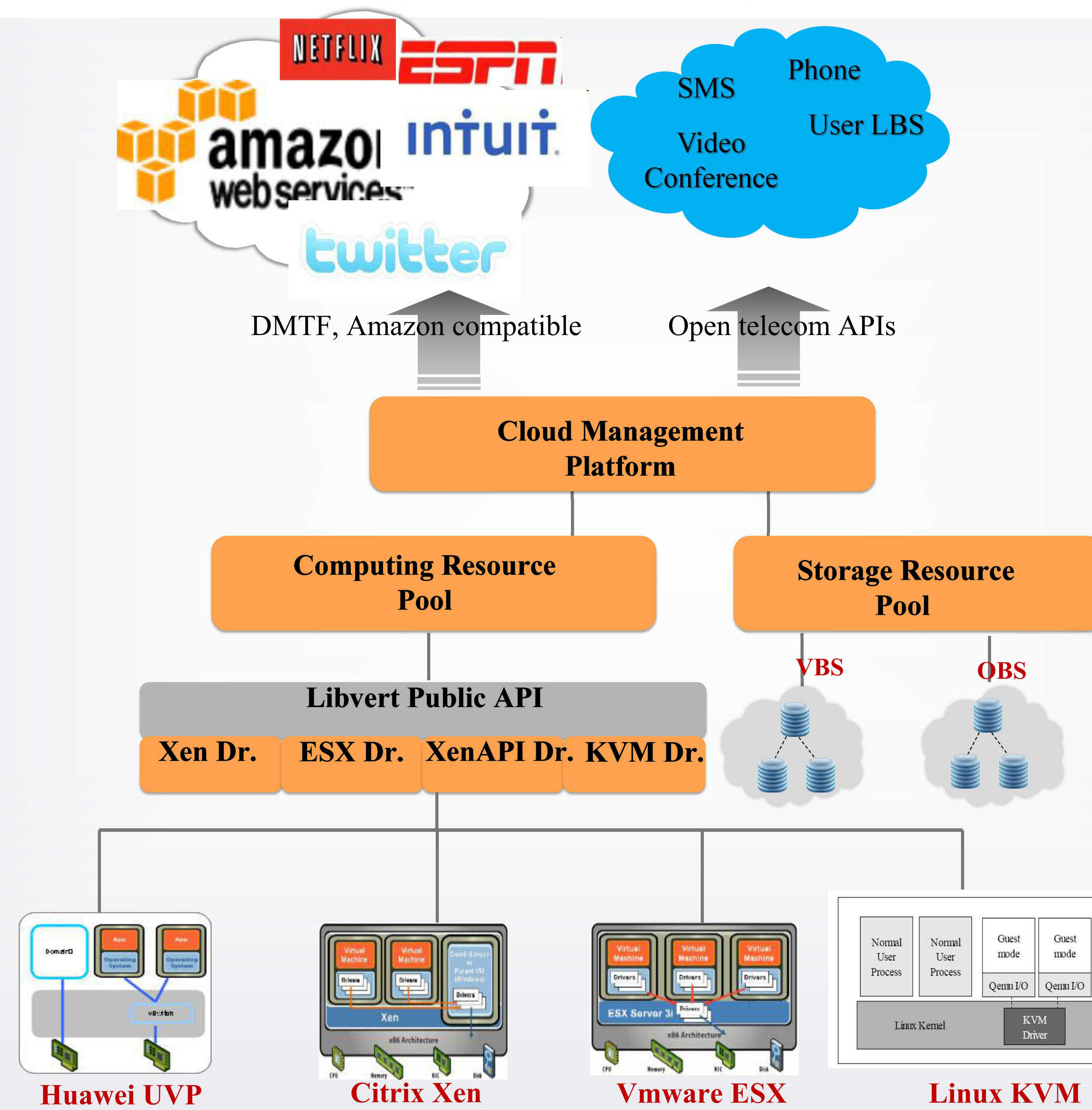


Figure 1. A cloud management structure

Disaster Recovery Module

To ensure the reliability of the cloud services, a disaster recovery module is imbedded in the system. It has a standard DR and Backup Platform with unified management of heterogeneous DR and backup technologies, as well as on-demand application for DR and backup resources, automatic resource allocation in minutes. It also can support cross-site OpenStack HA with Active-Active assurance to the cloud platform and cross-site auto failover. Moreover, it supports cross-cloud DR and backup, for example among private, hybrid, and public clouds, and has 2-level cloud backup and remote recovery capabilities.

Data lake

Hualu Data lake solution has been used as a resource pool to meet the requirement of big data storage as well as big data analysis. One of its new feature is to use blue-ray disks as storage media, which brings higher reliability, lower energy consuming and long life of 50 years compared to SSD or hard disk arrays for the latter needs to be changed every 3 to 5 years.



Pic 1. A data lake solution based on blue-ray storage

CONCLUSIONS

- The cloud computing and big data processing technology has great potential to improve the data transmission and processing activities in CTBT verification system.
- To ensure the reliability of the NDC as well as data transmission from each monitoring stations, a disaster recovery module should be well planned.
- Data lake based on blue-ray storage will improve the cost effectiveness of the system greatly.

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