



The public cloud is redefined for China

The world's largest wireline telecommunications, CDMA mobile network and broadband Internet services provider redefines public cloud for China.

Business benefits

Enables acquisition of SMB customers

Ease of self-service is critical to the business goal of supporting small to medium business (SMB) customers. End users will access their clouds via the company's native language user interface (UI).

Delivers even 2000-fold growth non-disruptively

This project is designed to expand 2000-fold in terms of the number of servers in the first 12 months alone. Automation from Nuage Networks Virtualized Services Platform (VSP) is the critical enabler for handling this high volume and growth.

Helps transform China's economy

Located near new, clean power source and a new university, the cloud facility is the nucleus of cloud services efforts in China. By building a current, best-practices public cloud from scratch, the company will help transform China into an online powerhouse.



nuagenetworks

From Nokia

Needs

The company's mission is to provide a public cloud that will work for small-to-medium business (SMB) all the way to large enterprises. End-user self-service is critical for selection as a cloud provider.

The company's existing cloud services — based on Apache CloudStack™ software — could not achieve the scale, both in terms of resources and operations, envisioned for this effort. For example, the #1 scalability measure — number of virtual machines (VMs) supported per server — was limited by bottlenecks in hypervisor-based switching and routing. Further, the operational and environmental needs of the project, such as intermix of hypervisors, bare metal support and tiered performance levels, could not be met. Lastly, a lack of network isolation (limit of VLANs) meant that a distributed denial of service (DDoS) attack against one customer impacted around 25 customers.

The very high expectations and technical bar for this initiative called for a fundamental redefinition of public cloud for the company.

The Company's approach

Faced with re-architecting the concept of the public cloud for China, the company selected Nuage Networks for the core automation capabilities of the Nuage Networks VSP; for the ability to resolve core networking performance, scalability and isolation challenges; and for support of the overall environment needed today and in the future.

A key limitation was the modularity and scalability of the CloudStack code base. Nuage Networks extended the networking component of the CloudStack architecture to make it modular. As a result, plugins can be introduced or modified without disrupting the core code base. Other modifications were made to attain the record-breaking levels of scalability required by the company. To help public cloud development efforts, these modifications are being submitted to the CloudStack community.

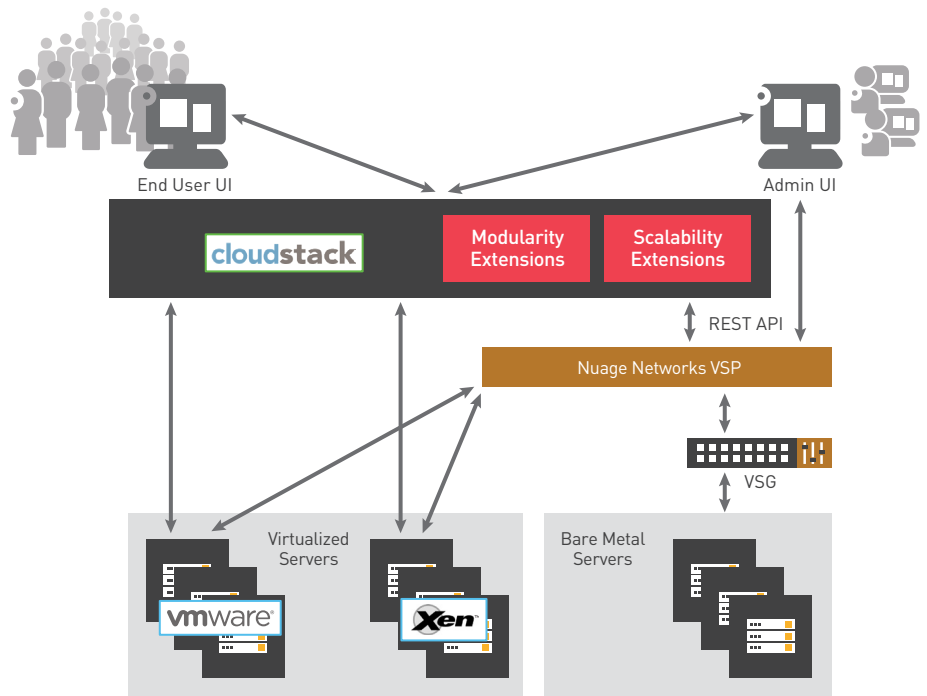
Nuage Networks VSP was leveraged to span both VMware and Xen environments under CloudStack control. To virtualize very large numbers of bare metal servers, the Nuage Networks 7850 Virtual Services Gateway (VSG) was implemented. All Nuage Networks VSP functionality is accessible via a REST API that is accessed both from CloudStack and from the company's operations consoles.

High bandwidth connectivity to the company's broadband Internet backbone is made via Nokia 7750 Service Routers (SRs). Security definitions for the 7750 SRs are automatically kept in synch with the public cloud via Nuage Networks VSP's policy automation capabilities.

The company's end-user UI controls the entire public cloud experience. There are two levels of service — VIP and Standard. Nuage Networks VSP's quality of service policies will be leveraged both to define the two levels of service and also to standardize these levels across all datacenters. Further, since Nuage Networks creates a unified network fabric, workloads can be easily migrated and load-balanced among datacenters.

"We are pleased that Nuage Networks has helped us to achieve scalability in our cloud infrastructure and improve the availability of the services. We can now offer our customers self-serve public cloud services in a more secure and dynamic way, giving them services that are tailored to meet their unique business requirements."

FIGURE 1. Nuage Networks VSP unifies the network under CloudStack control



About Nuage Networks

Nuage Networks (www.nuagenetworks.net) brings a unique combination of groundbreaking technologies and unmatched networking expertise to the enterprise and telecommunications industries. The Silicon Valley-based business has applied radically new thinking to the problem of delivering massively scalable and highly programmable SDN solutions within and across the datacenter and out to the wide area network with the security and availability required by business-critical environments. Nuage Networks, backed by the rapidly growing IP/Optical Networks business of Nokia, has the pedigree to serve the needs of the world's biggest clouds. The cloud has made promises — the mission of Nuage Networks is to help you realize them.

How this approach changes the game

This innovative approach helps the company change the game for its customers and its competitors.

Self-service VMs in 2 minutes

The company's existing premium cloud services were not automated. In contrast, the Public Cloud is fully automated. This approach provides the #1 success factor for prospective customers — self-service ease. With this approach, a virtual machine can be designed, ordered, and made available within two minutes!

Top scalability and efficiency goal achieved — number of VMs per server

The top scalability and efficiency goal — number of VMs supported per server — was limited by bottlenecks in hypervisor-based switching and routing. The Nuage Networks Virtual Routing and Switching (VRS) module substantially increases the efficiency of each network port, therefore enabling more VMs to be supported per server.

Self-service security for SMEs

Another critical success factor for SMEs is self-service for network security. SME administrators can define key security parameters such as Access Control List (ACL) rules for each tenant network and the company IP address. More importantly, this definition is made via Nuage Networks VSP's visual representation of complex network relationships. (This representation is made in the the company UI, communicating via REST API to Nuage Networks VSP.)

Full support across content management systems and hypervisors at scale

A key enabler for the company is Nuage Networks VSP's support across CMS stacks and across hypervisors at scale. These capabilities not only reduced complexity for the company's infrastructure but also provided the support necessary to win enterprise customers.

Predictable cloud SLAs

Leveraging Nuage Networks VSP's capabilities, the company's public cloud is able to provide predictable Service Level Agreements (SLAs). Nuage Networks VSP virtualizes the network to provide consistent, committed performance that is independent of the underlying server

and network hardware. Further, these SLAs are used to provide premium and standard service levels.

High security within the datacenter

Legacy security approaches focus on external threats rather than threats within the datacenter. Nuage Networks VSP's built-in security, including a default "Zero Trust" model, operates at the VM and virtual network levels. By protecting the datacenter at the first connection point to the network for VMs and applications, full security and isolation are provided within the rack, within each customer's operations and within the datacenter.

Full multi-tenant isolation

By removing the constraints imposed by legacy and hypervisor-based networking, the company can now provide full network isolation by tenant (customer/customer department). As a result, DDoS attacks against one customer do not impact others. Further, resource demands made by one customer do not impact others.

Scale-out resource model

The company has designed clusters of datacenters that will share a single network fabric managed by Nuage Networks VSP. Nuage Networks scales out via federated controllers to present a unified network fabric to any size cloud. A unified fabric enables a number of public cloud capabilities including consistent network service independent of underlying hardware, full workload portability among datacenters, and full programmability for future services.

Full datacenter capabilities

Most public clouds offer compute and storage but do not systematically address networking. The company is spanning compute, network, and storage to provide a complete datacenter as a service, exceeding the current capabilities of many of the public cloud giants.

Adding it all up

Tasked with clearing a skyscraper in a single bound, the company redefined the public cloud for China. The company architected a public cloud that combines staggering scale with complete end-user controllability. Working with Nuage Networks, the company is not only shaping the future of cloud computing but also shaping the future of China.