Leading 5G Innovations

ZXUS vSTG 9000

ZTE

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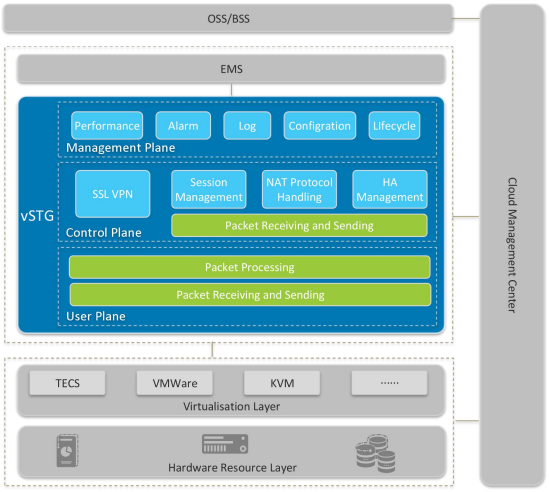
Overview

Rapid development of cloud computing and virtualization technologies tremendously change both data centers and networks. So besides old safety threats, customers today have to face lots of new security issues and challenges. In a cloud environment, different tenants ' virtual resources can be deployed on the same physical asset, which makes malicious users easy to attack the network via shared resources. Applications like mobile business and BYOD make it possible for terminals at internet to access the resources of the enterprise intranet. The blurring boundary between intranet and internet not only brings customers conveniences to process regular business, but also leaves more opportunities for attacks. Problems such as virtual migration and virtual escape urge for new security policies. At the same time, as today ' s booming new services are more strongly tied up with safety requirements, security issues become more vital and more complicated. Instead of being a simple precaution, the security capability shall be treated as an important service. Security service suppliers need to provide users and applications with opener and more flexible interfaces,as well as individualized security protection.

ZXUS vSTG(virtual Security Traversing Gateway) is usually deployed in the network access scenario where NAT, firewall, and HTTP proxy are available. It can enhance the user's access experience anytime and anywhere, ensure the security of user data, and provide end-to-end private network traversal and secure encryption for CM-IMS services.

Based on traditional security architecture, ZXUS vSTG 9000enables security traversing gateway abstraction and the pooling technology. ZXUS vSTG 9000can be automatically deployed and lifecycle management, and supports integration with multiple cloud platforms, such as TECS, VMware, etc.

System Architecture



Virtual Platform

The VM-based vSTG runs on universal servers to protect telecom networks. Adaptive to multiple virtual platforms including TECS, VMware, KVM and so on, it is not reliant on any private hardware, and allows decoupled hardware and software.

Software architecture

To perform efficient data forwarding and make the system more reliable and secure, the vSTG is designed with a separate management plane, control plane and user plane. The management plane implements management of performance, alarms, logs, configurations and life cycle. The control plane takes responsibility for protocol processing and generation of policy information. The user plane performs packet filtering, packet conversion, packet processing and packet forwarding as per static configuration or dynamic policy information.

The isolation is performed in the following ways:

Isolation of network planes: The network is split into a control plane network, management plane network and user plane network.

Isolation of processes/threads: All the processes of the control plane, management plane and user plane are independent. The threads on the user plane are bound to vCPU cores.

Cloud management center

vSTG components locate at the cloud management center. During the virtual network orchestration and operation, the vSTG components as per different security protection scenarios work together with other network element at the cloud management center to provide related management services and make vSTG life cycle management proceed.

Operation maintenance and management System

As a universal operation maintenance and management system, the EMS enables the virtual security device to provide operation maintenance services and visualized display of alarms, performance and logs.

Features

High Performance/Low Latency

The vSTG employs many technologies including SR-IOV, DPDK and separated control and forwarding to improve performance and reduce latency.

- SR-IOV

By using the SR-IOV technology to share one PCI device with multiple VMs, the vSTG enhances the utilization rate of I/O devices and shortens the network latency. The SR-IOV can work on GE/10GE/40GE interfaces.

- DPDK

The vSTG employs the DPDK technology to enable more powerful system processing. Using multi-alignment hardware directly, the DPDK accesses the hardware resources via polling in user mode, which improves the network I/O throughput capability. Sorting hardware into different classifications effectively saves CPU resources. Using Hardware queues for processing messages can prevent obstacles caused by software distribution threads.

- Separated control and forwarding

The vSTG uses different paths to separate control plane services (for example, protocol processing and dynamic generation of policy information) and user plane services (for instance data packet filtering, forwarding and processing), making data forwarding more efficient.

High Reliability

The vSTG employs the enhanced VRRP protocol running on the HA path between the active and standby OMPs to ensure the firewall capable of working in the hot redundant mode. When the system is running, the active and standby OMPs negotiate their working mode according to the received VRRP messages. When any of the active vSTG unit (PP) breaks down, the standby vSTG unit will take over its work automatically.As the HA path is an independent neutron network, it does not affect service networks.

Fast Deployment

Automatic Deployment: The vSTG can be deployed on a universal server automatically. When maintenance engineers finish making the vSTG deployment blueprint, the entire deployment can be done rapidly, flexibly and automatically, which obviously makes the O&M much easier.

Easy to Integrate

Easy to Integrate: The vSTG can be easily integrated to different security protection scenarios. Related cloud management centers are responsible for the orchestration and management.

SDK Client Integration: SDK clients support a variety of operating systems, including Android, IOS, Windows and Mac.

Rich Security Services

A rich defense functions, for instance, the ACL-based packet filtering, status

inspection, ASPF, inter-zone policies, DDoS, DPI and carrier-grade security protection.

The vSTG can detect and control multiple protocol packets, support SSL VPN, and provide rich defense functions such as ACL packet filtering, state detection, ASPF, inter-domain policies and so on.

Specifications

To satisfy the requirements of diversified resources, the vSTG can be deployed with varying specs.

- C4 and C8: Keep the network safe while satisfying operators/enterprise users' some resource restrictions.
- C14: Keep the network safe while satisfying operators/enterprise users' high-performance requirements.

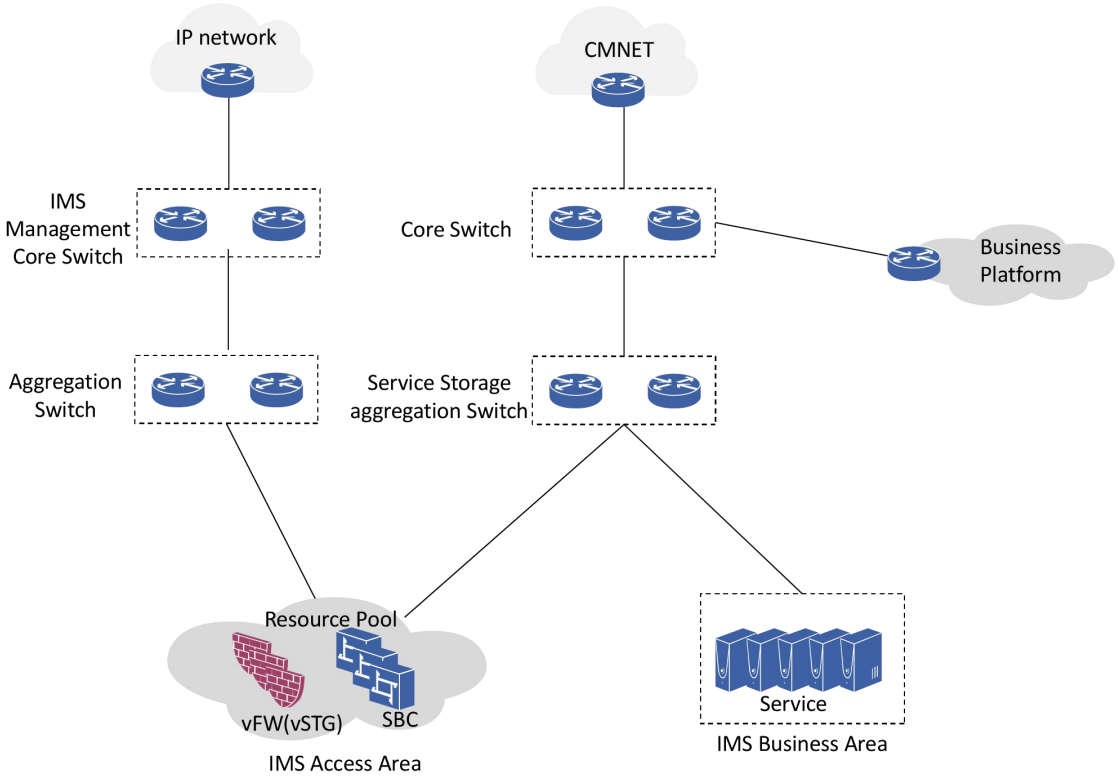
The performance of the vSTGs in different specs are as shown in the following table.

Specs/Types	vCPU	Memory(GB)	Storage (GB)
C14	14	40	40
C8	8	32	40
C4	4	20	30

Application Scenarios

The vSTG is deployed on the CM-IMS network. The enterprise network can deploy devices such as HTTP proxy to connect to the vSTG, and use the vSTG as the entry point of the CM-IMS. As the server of the VPN tunnel, the vSTG is responsible for maintaining the VPN tunnel established between the vSTG and the CM-IMS terminal, and encapsulating/decapsulating the CM-IMS service data. VPN tunnel types include TLS tunnels and DTLS tunnels, and it can optionally extension to HTTP tunnels.

The terminal encapsulates the CM-IMS data and transmits it to the vSTG through the tunnel. The vSTG decapsulates the packet and forwards it to the SBC, and then processes the CM-IMS service data. When the CM-IMS service data is sent from the core network to the terminal through the secure tunnel, the SBC sends the data to the vSTG. The vSTG encapsulates and encrypts the service data and forwards it to the CM-IMS terminal through the secure tunnel. The vSTG has the ability to manage online user sessions and assign virtual IP addresses to CM-IMS terminals.



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