OpenStack platform

**My name** is Anatoly Vasilenko and today I would like to **tell** you **about OpenStack** software platform. However, before I am going to introduce it to you I will tell about **Cloud Computing**.

Cloud computing is the **division of labour concept** in IT scope. It is very popular for already more than 5 years already. There are three main **types of services** which can be served to the customer: Infrastructure as a Service, Platform as a Service and Software as a Service. They are forming **stack** and varies in abstraction level **offering to the customer** virtual machines, or computing system or the software. Because of the **division of labour** clouds can gain benefits like reduction of the overall costs for resources, electric power and other datacenter costs, and at the same time get better scalability, redundancy, availability, productivity and other business significant benefits.

**OpenStack is** a free and open-source cloud-computing software platform. It **was created** about 5 years ago and now **has a big community** of developers, users and vendors around it. Even has its own governance. The **mission** of the OpenStack is to create universal platform for managing clouds of different purposes.

However, the **OpenStack is not the only one** cloud software platform, but it is the **most upcoming** or at least there is **more marketing** about OpenStack comparing to the other platforms from Amazon or OpenSwift or others. Between other existing systems, Amazon cloud is **the most similar** to the OpenStack. OpenStack even has the same API, enabling the applications written for Amazon to **be freely ported** onto the OpenStack. This gives a **huge lift up** on the path of **conquering** the world, because Amazon has the biggest cloud platform nowadays.

OpenStack is only five years old, but since its creation different **companies started to maintain** this project and the **community** started to **grow up as a snowball**.

OpenStack can manage **different operating systems** – Linux, windows or bare metal, and can cooperate with different types of **hypervisors**, such as Xen, VMware, KVM or even Linux containers for those who need minimal virtualization overhead.

OpenStack has **modular architecture**, what makes it more **flexible** and enables **separate development** of different component and services. **Good API specification** makes components even more independent. Now user, who is setting up its own cloud, **can use only those components which are required** by his applications.

There are **three type of services**: **core** services, that are needed in every cloud setup, **shared** services, that are the most widespread services giving additional functionality and other services, that are not commonly used, such as Designate service, which provides DNS as a Service.

Now, I would like to introduce to you some of the OpenStack components. There are 16 of them:

1. **Nova** is a compute service; it is a **cloud fabric controller** that is designed to **manage pools of** computer resources.
2. **Glance** is an image service, which manages the operating system images, it **can store, backup** and even **migrate** them while running.
3. There is **two types of storages** available in the OpenStack: Object storage called **Swift**, which purpose is to **store and retrieve data as objects** with simple API, and Block storage called **Cinder**, which is used to **attach emulated block devices** to virtual machines.
4. **Horizon** is a dashboard, **providing** administrators and users **with the graphical interface** to access and manage their cloud.
5. **Keystone** is an identity service, which is used to authenticate users and **grant to them** some **access permissions**.
6. **Neutron** is an OpenStack networking controller, **it manages the network**, controlling services like DHCP, static IP addresses, firewall, load balancer, virtual private network and some other network services.
7. **Heat** is an orchestrator. Orchestration is the **concept** of **unified management** and exception handling. Heat **can set up** your whole cloud by **using only template** with the description of the infrastructure. The templating language is also **compatible with** configuration management **tools** such as Puppet and Chef.
8. **Ceilometer** is a telemetry service, which is capable of **collecting usage and performance statistics** across the services. This is one of the most needed service for hosting providers, because it establishes the customer billing.
9. **Trove** is a database service **focused on automation** of complex administration task.
10. **Sahara** is the OpenStack realization of **Hadoop**.
11. **Ironic** is special project, which allows managing not the virtual machines, but **running the bare metal**. It is based on PXE and IPMI interface technologies.
12. **Zaqar** is the OpenStack realization of the queue service, it **is based on the principles of Amazone** similar project, but additionally **handles broadcasting**.
13. **Manila** is the realization of **shared file system**.
14. **Designate** is a service introducing **DNS as a service**.
15. And **Barbican** is a security project, which main goal is to create a **centralized secret-store for keying material**. This project is targeted to **create its own community** and to become not only the part of the OpenStack project, but to become a standalone project in our world.

In conclusion, I would like to say that OpenStack has **well thought-out architecture** and it seems that it achieved its main goal and now rapidly **spread across the market**.