Cloud Computing, OpenNebula and FreeBSD

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Cloud Computing

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

Source: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

OpenNebula

OpenNebula is a simple yet powerful, and flexible turnkey open-source solution to help build private clouds and manage data center virtualization.

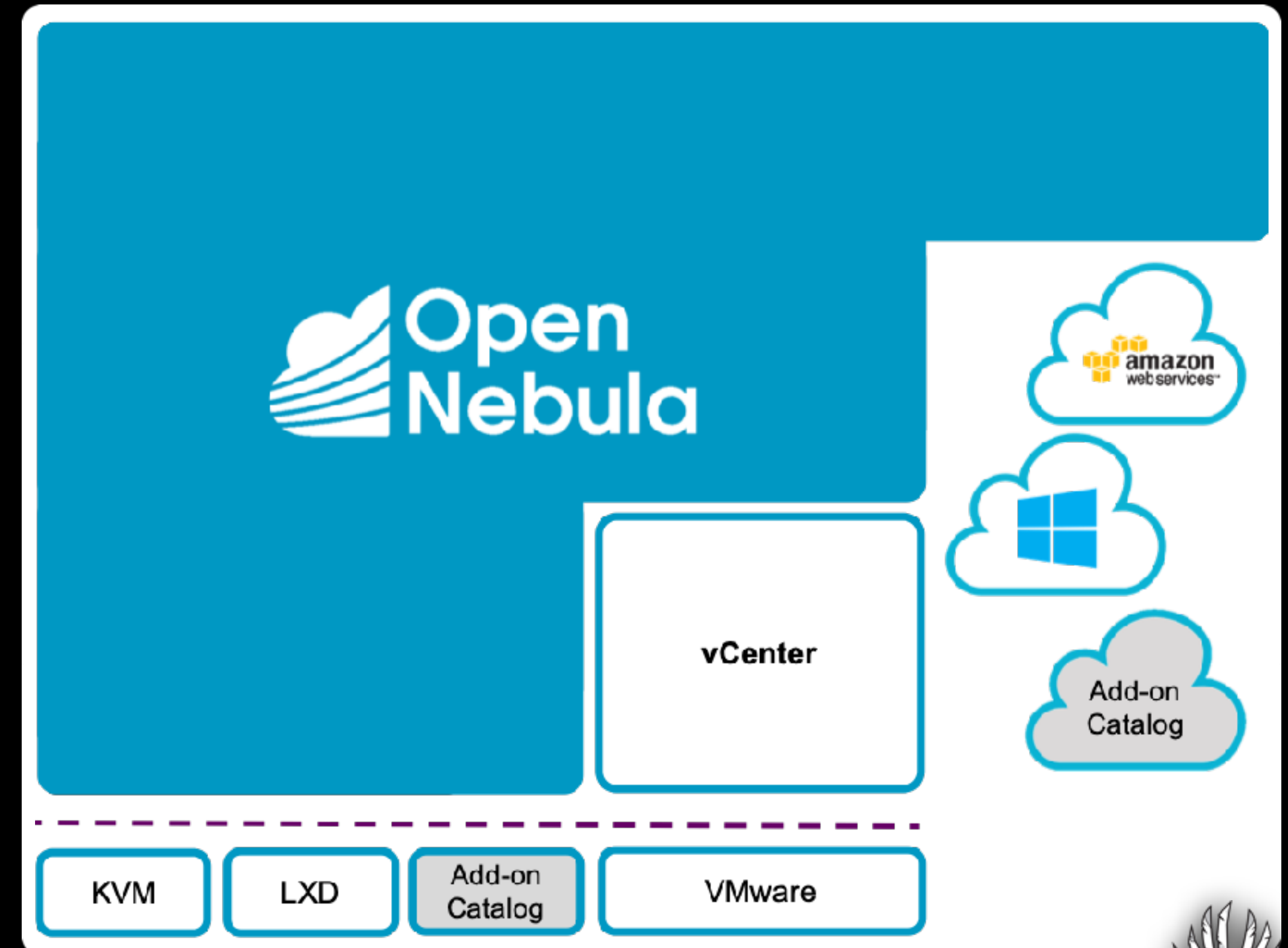OpenNebula was derived from a NASA project which was publicly released in 2008.

OpenNebula features

- Platform independent
- KVM, VMware and LXD support
- Capacity and performance management
- High availability
- Multi-VM applications support
- Managed by CLI, WebUI, and by Python, Ruby, Java, Go bindings
- Support for hybrid cloud computing (AWS, Azure)
- Security (ACLs, quotas, groups, roles, VMs isolation…)
- Accounting and billing

FreeBSD in the clouds

FreeBSD instances are available in public clouds: AWS, Azure, GCP, DigitalOcean, Oktawave (PL)

FreeBSD has support for KVM, Hyper-V and VMware virtualization - it works and performs very well.
Support for paravirtualized devices is important for production environments - we noticed 1,5x better performance when FreeBSD was using virtio_scsi and vtnet instead of SATA and E1000 emulation.

FreeBSD also supports ONe contextualization, and cloud-init, which is used in most public clouds, OpenStack, Proxmox, etc.

FreeBSD and clouds - the future

The latest OpenNebula version (5.8, from February 2019) has added support for LXD - Linux Containers. Maybe it's a good idea, to add support of FreeBSD jails to OpenNebula? Sounds like a plan!

Another idea is to create FreeBSD jails alternative for Kubernetes or OpenShift containers.

Questions?

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