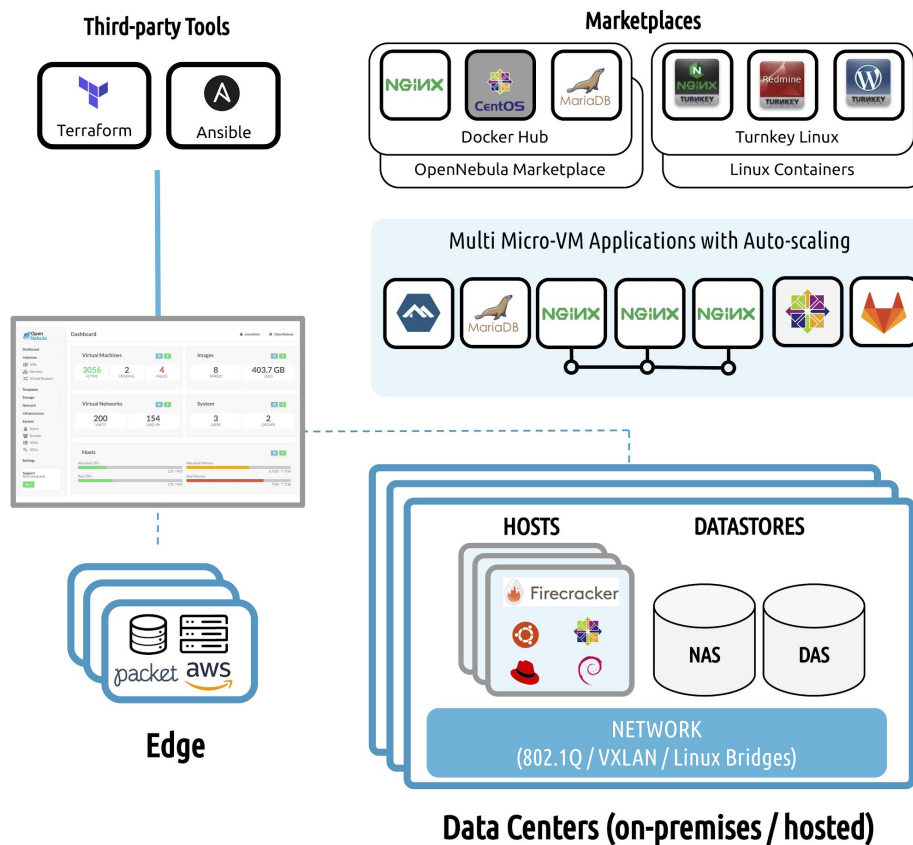# Firecracker Cloud

OpenNebula

AT A GLANCE

Firecracker is a new virtualization technology to create and manage microVMs that provides enhanced security and workload isolation over traditional VMs, while enabling the speed and resource efficiency of containers. Firecracker is widely used by AWS as part of its Fargate and Lambda services for multi-tenant container and function-based services. OpenNebula has implemented a pioneering approach towards container orchestration that incorporates all the strengths of a Cloud Platform but without adding extra layers, thus reducing complexity, resource consumption, and operational costs.

KEY BENEFITS

- Seamless **integration with container marketplaces**, like Docker Hub.

- **Direct execution of Docker images** on microVMs and **composition of containers with auto-scaling.**

- **Multi-tenant**, **self-service cloud provisioning** including **virtual data centers**, data center **federation** and **hybrid** computing to connect in-house resources with public and edge clouds.

- **Mixed hypervisor environments** with KVM and VMware.

Third-party Tools

Terraform   Ansible

Marketplaces

Docker Hub
OpenNebula Marketplace

Turnkey Linux
Linux Containers

Multi Micro-VM Applications with Auto-scaling

Edge

packet aws

HOSTS   DATASTORES

Firecracker

NAS   DAS

NETWORK
(802.1Q / VXLAN / Linux Bridges)

Data Centers (on-premises / hosted)

SYSTEM REQUIREMENTS

- Front-end: 2 CPU (4 cores) with 8GB memory, 200GB disk and 2 NICs

- Hypervisors: Depends on the expected workload; recommended to have at least 1GB per core

SCALABILITY

- Front-end: Tested on 2,500 servers

- Hypervisor: Tested with 1,500 microVMs

- Horizontally scale your cloud by adding new zones within a federated deployment

miniONE

TRY IT NOW!
http://miniONE.opennebula.io

In **just five minutes**, use **miniONE** to deploy a fully functional implementation to evaluate just how simple OpenNebula is.

Red Hat
Technology Partner

ubuntu
Software partner

More details about OpenNebula and its features at OpenNebula.io

OpenNebula Specs on Firecracker

On-Demand Self-Service Provisioning

Application Containers	❏ Full support for Docker images microVMs for enhanced security and workload isolation over traditional VMs, while enabling the speed and resource efficiency of containers
Service Auto-scaling	❏ Define and manage services as a group of related microVM containers, including their interconnection networks and elasticity rules
Service Insight	❏ Monitor service-specific performance metrics and set elasticity rules based on them
Private Marketplaces	❏ Build your own private marketplaces based on S3 and HTTP protocols
Public Marketplaces	❏ Integration with Docker Hub, with OpenNebula Public Marketplace with pre-built and certified appliances with popular OSS components and OS like k8s, WordPress, Gitlab, Centos or Ubuntu, and with LXD containers popular marketplaces: linuxcontainers.com and Turnkey Linux
APIs	❏ Ruby, Python, Go and JAVA or XML-RPC
CLI	❏ Fully featured UNIX-like command line tools
GUI	❏ Sunstone, a modern and simple Web-UI for admins and advanced users. Cloud View, a simplified provision portal for end-users. Remote access through VNC is integrated in the GUIs

Resource Management

Authentication	❏ Built-in password-based, Active Directory, SSH, X509, LDAP, login tokens and 2FA
Multi-tenancy	❏ ACLs, users, groups, resource UNIX-like permissions and VDCs
Capacity Management	❏ Limit usage with user/group quotas. Fine-tune container allocation with dynamic placement constraints and affinity rules. Automatically schedule virtual networks and datastores
Observability	❏ Monitoring, accounting, showback and auditing/traceability
Networking	❏ Virtual routers, NIC hotplugging, security groups and support for IPv6 and IPAM modules
Host	❏ CPU pinning and LXC profiles
Storage	❏ Disk resizing, hotplugging, persistency. Compatibility with multiple partition images
Automation	❏ Hook system for tailoring and logging, programmable container operations, and context to further customize containers based on user input
Backup	❏ Use a private marketplace (HTTP or S3) for periodic backup of your VMs.

Cloud Architectures

High Availability	❏ OpenNebula components HA-based on RAFT consensus and container/host failover
Automatic Provision	❏ Automatic deployment of Edge Clusters on virtual and bare-metal cloud providers
True Hybrid and Edge	❏ Dynamic geo-distributed private clouds on public cloud resources
Federated Cloud	❏ Federation of multiple OpenNebula zones for scalability, isolation or multiple-site support
Mixed Hypervisor	❏ Support for multi-hypervisor environments that use VMware, KVM, LXC and Firecracker