

NephOS

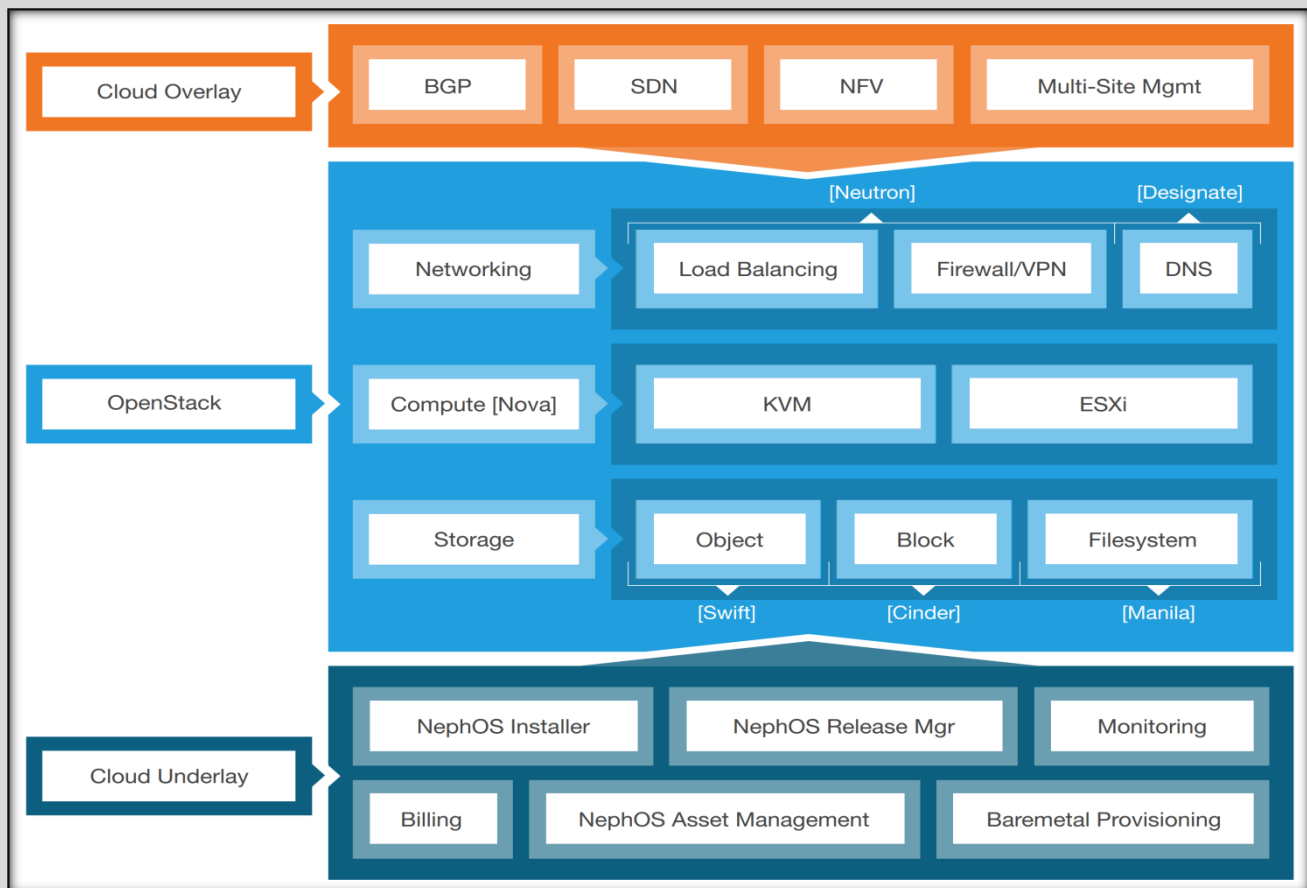
A Single Turn-key Solution for Public, Private, and Hybrid Clouds

What is NephOS?

NephoScale NephOS is a turn-key OpenStack-based service-provider-grade cloud software suite designed for multi-tenancy. It is a single software stack designed for creating public, private, or hybrid clouds, that can all managed from a single pane of glass. NephoScale NephOS is true ‘cloud software’ that is designed to address a broad range of use cases, and enables Managed Service Providers (MSPs) to create new cloud services revenue streams of their own.

NephOS is a multi-tenant cloud software solution ideally suited for both MSPs and the most demanding enterprises. In addition to offering a robust service-provider-grade IaaS software solution, NephoScale has created the unique NephOS Cloud Installer and NephOS Release Manager tools that enable operators to easily install their own public, private, and hybrid clouds, and self-manage them.

NephoScale NephOS Cloud Software Stack



Why NephoOS?

NephoScale has solved some important problems that both MSPs and large enterprises face with complex cloud deployment and management. NephoScale has collapsed the time it takes to deploy a multi-tenant service-provider-grade cloud platform from months, or even years, to a matter of hours. NephoScale highly leverages OpenStack technology, then augments, hardens, and commercializes it, and then adds capabilities that go beyond the scope of OpenStack. NephoOS is a unique cloud software solution that not only delivers the benefits that come from the continued innovation and standardization provided by the OpenStack open-source community, but also brings important capabilities not found in other OpenStack solutions.

Benefits

- High performance
- Security and reliability
- Improved operational efficiency
- Agile IT
- Reduced risk for experimentation
- Rapid innovation
- Limitless storage capacity
- Achieve 99.95% SLAs
- Lowered capital costs
- Reduced time to market
- Windows and Linux support
- Remote management
- Disruptive pricing

Features

- Virtual and dedicated bare metal servers
- SDN powered network security
- Role-based access control
- Scalable to millions of transactions/day
- Fully compatible with existing systems
- Self-service 24/7 on-demand provisioning
- Capable of storing petabytes of data
- Highly redundant platform design
- Multi-tenancy support for unlimited accounts
- Integrated automation and build system
- Single-tenant or multi-tenant deployment options
- VNC console access
- Flexible billing and chargeback capabilities

Technical Specifications

Management & Administration

User Portal

- Enables self-provisioning
- GUI control over all cloud resources
- Cloud Storage Explorer
- VNC console access to virtual servers
- Help desk support
- Staff area for ticket, billing, and inventory

APIs & SDKs

- REST API for all supported OpenStack projects
- Common client libraries in many languages

Multi-Tenancy

- Multi-layer security and access controls
- Account level ownership of resources

Authentication Methods

- Username/password
- Security token
- Staff two-factor authentication
- Enterprise backend support such as LDAP/AD

Role-Based Access Control

- Access control lists
- User roles

CLIs

- Common CLI clients for all supported OpenStack projects for staff and customers

White labeling

- White-label and re-branding support
- Payment gateway integration using merchant account

Identity and Access Management

Hierarchical Protection Domains

- Separate roles for customers and staff
- Staff users have supervisor privilege over customer accounts

Image Management

- Windows and Linux support
- Image publishing
- Image permissions
- Private images

Server Management

- Full root/administrator access
- Start/stop/reboot
- VNC console for virtual servers
- High Performance Computing
- Support for 10 Gbps NICs
- Support for GPU or PCIe flash storage options on dedicated bare metal servers

Storage

Direct Attached Storage

- Persistent local storage for both virtual and dedicated servers preserves data during reboots
- RAID redundancy for both virtual and dedicated bare metal servers
- SATA or SSD storage options
- Predictable IOPS performance

Cloud Storage

- Highly available and fault-tolerant
- Based on OpenStack Object Storage

Resource Audit Trail

- Resource log of provisioning requests
- Audit trail of resource creation by user, run time, create time, and status

Keys

- SSH key or username/password configured on server first boot

Compute

Virtual and Dedicated Server Support

- L2 and L3 private and public networking
- Same base images can deploy to both virtual and dedicated bare metal servers
- KVM hypervisor for virtual servers
- ESXi hypervisor for virtual servers
- Dedicated bare metal servers provisioned on-demand using GUI, API, & OpenStack Heat Templates

Software Defined Networking

- On-demand public and private networks
- Sub-millisecond latency within the data center
- 1, 10 and 40 Gbps network connectivity
- SDN network overlay traffic isolation
- Scale out network topology eliminates SDN router capacity planning
- SDN routers are optimized for maximum traffic flows
- Switch vendor neutrality due to network overlay packet encapsulation
- VLANs, LACP, LLDP, BGP, and OSPF support
- L2/L3 networking for both virtual and dedicated servers
- Unicast, broadcast, and multicast support
- Service Chaining support for firewalls and packet sniffing

High Availability

- High availability and failover routing architecture
- Redundant top-of-rack switches and cloud controllers for N+1 redundancy
- Redundant virtual neutron routers for N+N redundancy
- Compute nodes maintain redundant connections to top-of-rack switches
- Management cluster supports N+1 redundancy

- REST API compatibility with OpenStack Object Storage and AWS S3
- Container synchronization across geographic regions
- Object caching, versioning, and expiration
- Container public access, metadata, and web indexes
- Large object support and multipart upload
- HTTP Range requests (HTML5 video streaming)
- Cross-site HTTP requests (aka CORS)
- Cross-domain policy file (Flash, Java, and Silverlight compatibility with REST API)

Networking

IP Addressing

- Persistent IP addresses and Internet connectivity
- IPv4 support
- Deploy servers with public/private IPs, private only IPs, or no IPs for DHCP

Support

Help Desk

- Support tickets
- Ticket queues
- Support teams

Notifications

- System Maintenance
- Release Notes

Billing

Pricing, Payments, and Invoicing

- Customize SKUs and pricing
- Standard pricing override support
- One-time fee support
- Software license and upgrade tracking
- Multi-tier credit card and payment gateway capability
- Semi-monthly, monthly, and annual membership invoicing based on hourly or monthly usage

- Deploy resources to different geographic regions

Deployments & Automation

Orchestration

- Heat – YAML based
- Deploy distributed applications with a single click
- Idempotent operations for all template changes of all cloud resource types
- Dependency based programming
- Parallel processing of resource provisioning requests
- Code enveloping of Chef, Puppet, or Ansible
- Distributed state machine runs across Heat engine and server agents

Scripts

- Scripts run any type of interpreted code on server first boot using cloud-init
- Script output is available in server log

Asset Management

- Physical asset tracking of data centers, switches/modules/ports, servers, CPUs, disks, RAID, memory, and network ports
- Virtual asset tracking of CIDRs, subnets, IP addresses, VLANs, security rules, and zones

Reports

Dashboards

- Track numbers of accounts and resources deployed
- Track CPU and I/O utilization of compute nodes

Scoreboards

- See system metrics for data centers, cloud storage, images, virtual servers, dedicated bare metal servers, and accounts

Metering

Usage

- Track cloud storage usage on data transfer, size of data stored, and API requests
- Track virtual and dedicated server usage on data transfer, bandwidth, and instance size

- metering

Data Center

Zones & Racks

- Deploy resources across multiple availability zones
- Group physical resources into granular and flexible tiers
- Isolate system and network resources to meet single tenancy requirements

Inventory Management

Automated Hardware Ingestion

- Top-of-rack access switches/ports added to network inventory
- Network scanner supports Cumulus operating systems
- Compute nodes, dedicated bare metal servers, and network nodes added to inventory on first boot

Quotas

- Support for manual approval of dedicated bare metal server provisioning requests
- Enforce virtual and dedicated server quotas on the number of instances and total memory deployed

Release Management

Deployments

- Build and packaging system
- Automated upgrade release without any impact to customer services

NephOS and OpenStack: The best of both worlds

While OpenStack is an important open source project that is gaining momentum as a component framework for building clouds, it is not a cohesive product that is easy to deploy or simple to operate. NephOS and OpenStack together provide superior performance, greater security and reliability, and significant cost reductions.

NephOS Software-Defined-Datacenter Features Unavailable In OpenStack

Virtual and Dedicated Server Support

- L2 and L3 private and public networking
- Same base images can deploy to both virtual and dedicated bare metal servers
- Dedicated bare metal servers provisioned on-demand using GUI & API

Billing & Support

- Customized SKUs and pricing, pricing overrides, one-time fees, multi-tier credit cards and payment gateway integration
- Semi-monthly, monthly, and annual membership invoicing based on hourly or monthly usage metering
- Support help desk and customer notifications

Brewer Data Center Asset Management

- Automated ingestion into inventory of hardware components such as servers, switches and ports
- Asset tracking of physical and virtual inventory in the data center

Brewer Auto-Installer

- Turn-key self-service installation within hours
- Zero touch provisioning of switches, cloud controllers, and database nodes

Brewer Release Manager

- Build and packaging system for seamless upgrades
- Automated upgrade release without any impact to customer services

Networking

- High availability with failover network architecture
- Horizontal scale out network topology eliminates SDN router capacity planning
- SDN routers are optimized for maximum traffic flows

NephOS Certification Process Of OpenStack Capabilities

In Development

- OpenStack File Storage (code-named Manila)
- OpenStack Database (code-named Trove)
- OpenStack Big Data (code-named Sahara)
- OpenStack App Catalog (code-named Murano)
- OpenStack Containers (code-named Magnum)

NephOS Certified

- OpenStack Metering (code-named Ceilometer)
- OpenStack Block Storage (code-named Cinder)
- OpenStack Rating-as-a-Service (code-named CloudKitty)
- OpenStack DNS (code-named Designate)
- OpenStack Bare-metal (code-named Ironic)
- OpenStack Images (code-named Glance)
- OpenStack Orchestration (code-named Heat)
- OpenStack UI Portal (code-named Horizon)
- OpenStack Identity (code-named Keystone)
- OpenStack Compute (code-named Nova)
- OpenStack Networking (code-named Neutron)
- OpenStack Object Storage (code-named Swift)