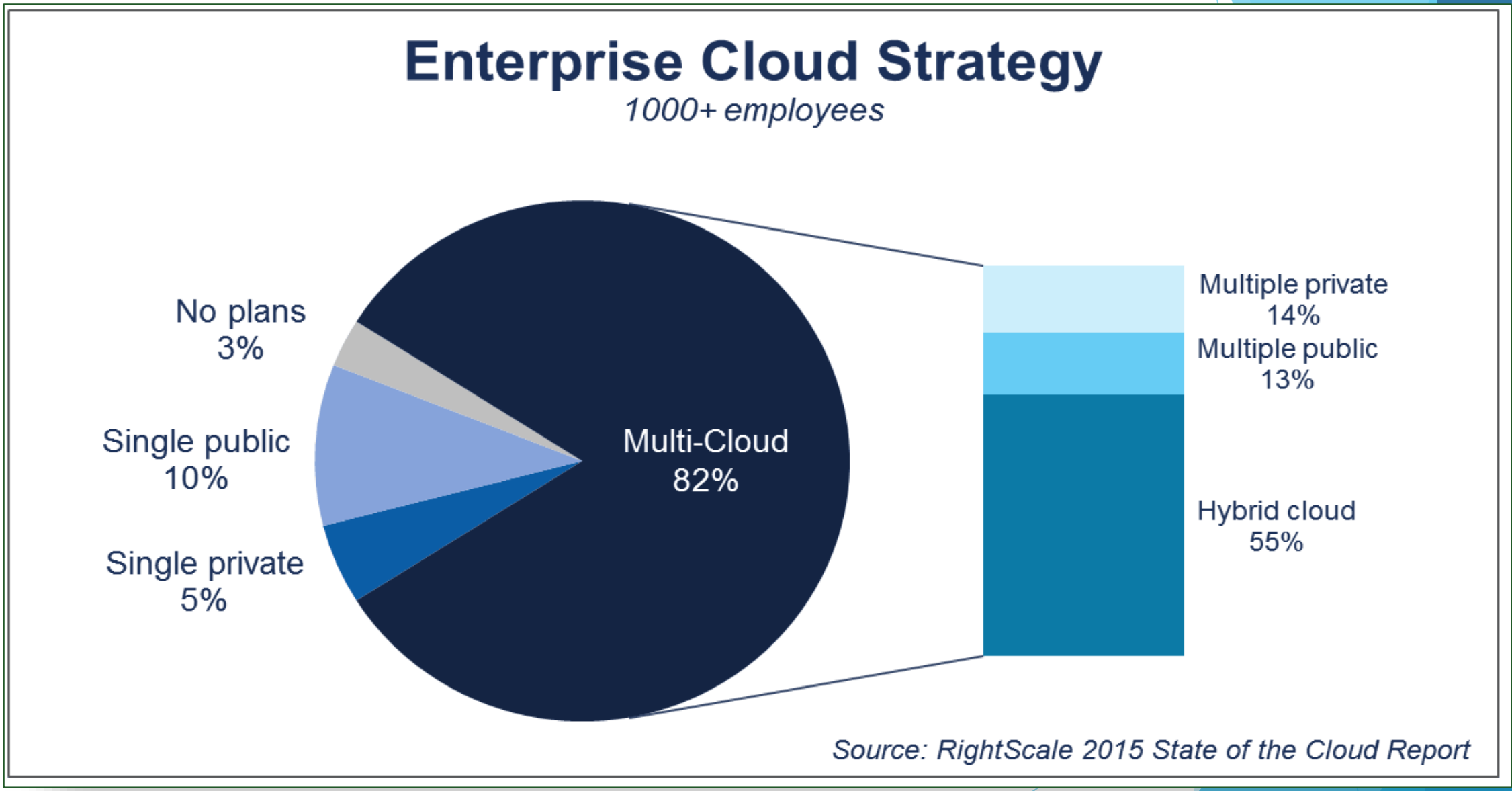
# AccentOS Cloud platform

# About company

1. Started at - 2014
2. Ownership - private
3. Placement – Kazan, Moscow
4. Employees - 55 persons

# Strategy


Enterprise Cloud Strategy
1000+ employees
No plans
3%
Single public
10%
Single private
5%
Multi-Cloud
82%
Multiple private
14%
Multiple public
13%
Hybrid cloud
55%
Source: RightScale 2015 State of the Cloud Report

# Strategy (common)

Development cloud platform for service providers (SPs)

SP’s customers – large and medium enterprises

Basement – OpenStack with enterprise features in private cloud, VDI

SP’s products – virtual private cloud (VPC), virtual private datacenter (VDC), hybrid cloud

# Strategy (SP)

Automatic enrollment and configuring of platform

Automatic enrollment and configuring VPC, VDC

Integrated services (Backup, Logging, Monitoring, Access)

Automatic enrollment and configuring of PaaS

API for billing

# Strategy (clients)

Virtual datacenter for large enterprises

Large enterprises requests and features in private cloud

(aka VMware, Citrix)

- Live migration, DRS, etc.
- VDI ant terminal clients
- Unified storage
- Integration with enterprise storages

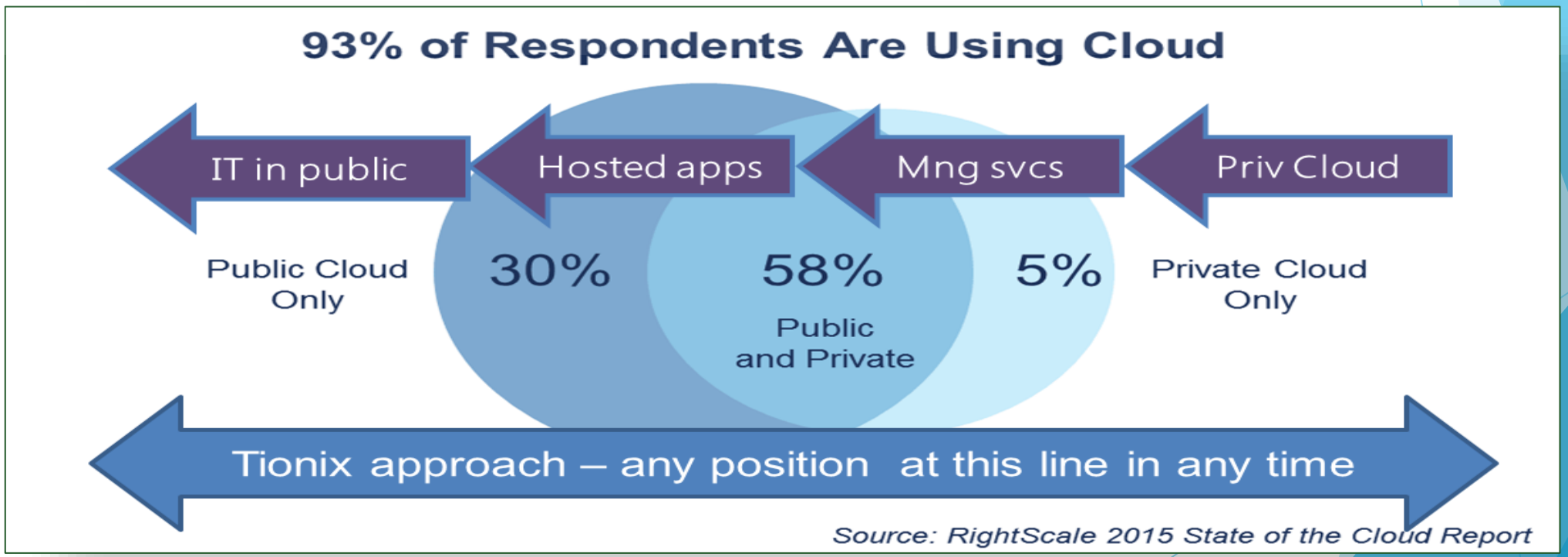
# AccentOS Customer flexibility

Movement to cloud in client's pace

Combining the resources of the SP and customer

Saving client's investments

Delegation the cloud management to the client



# Strategy (technologies)

Linux, Ethernet (x86, ARM, PowerPC, MIPS)

Open source

OpenStack

Ceph, iSCSI, FC, NFS, own unified storage

Zabbix, ELK, BareOS, Prometheus, etc.

# OpenStack problems and AccentOS

OpenStack complicated installation – min 2 days

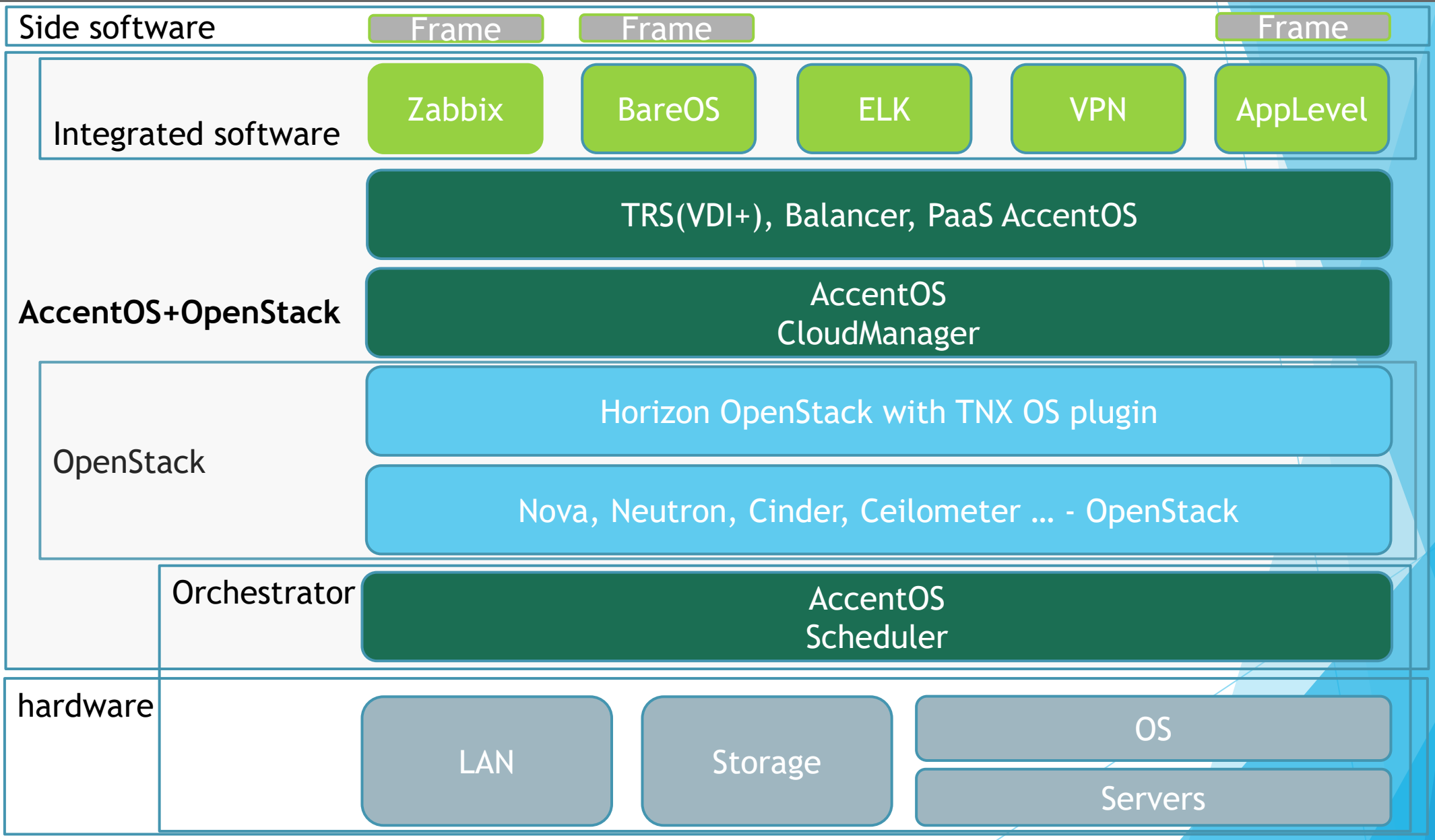
A lot of configuration parameters and files in OpenStack and LAN

Too many OpenStack integrations with third party products

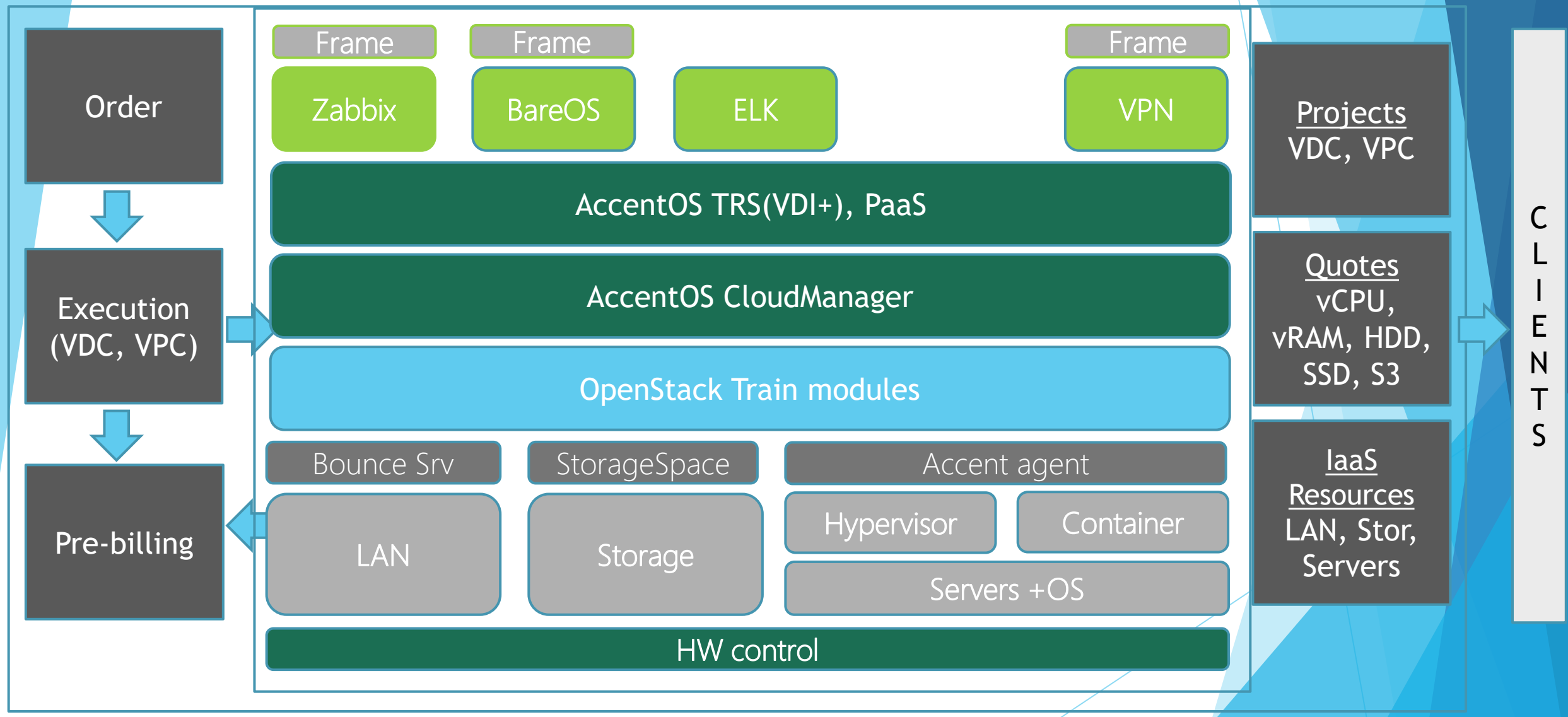
Storage (Ceph) has a medium performance

# AccentOS Architecture

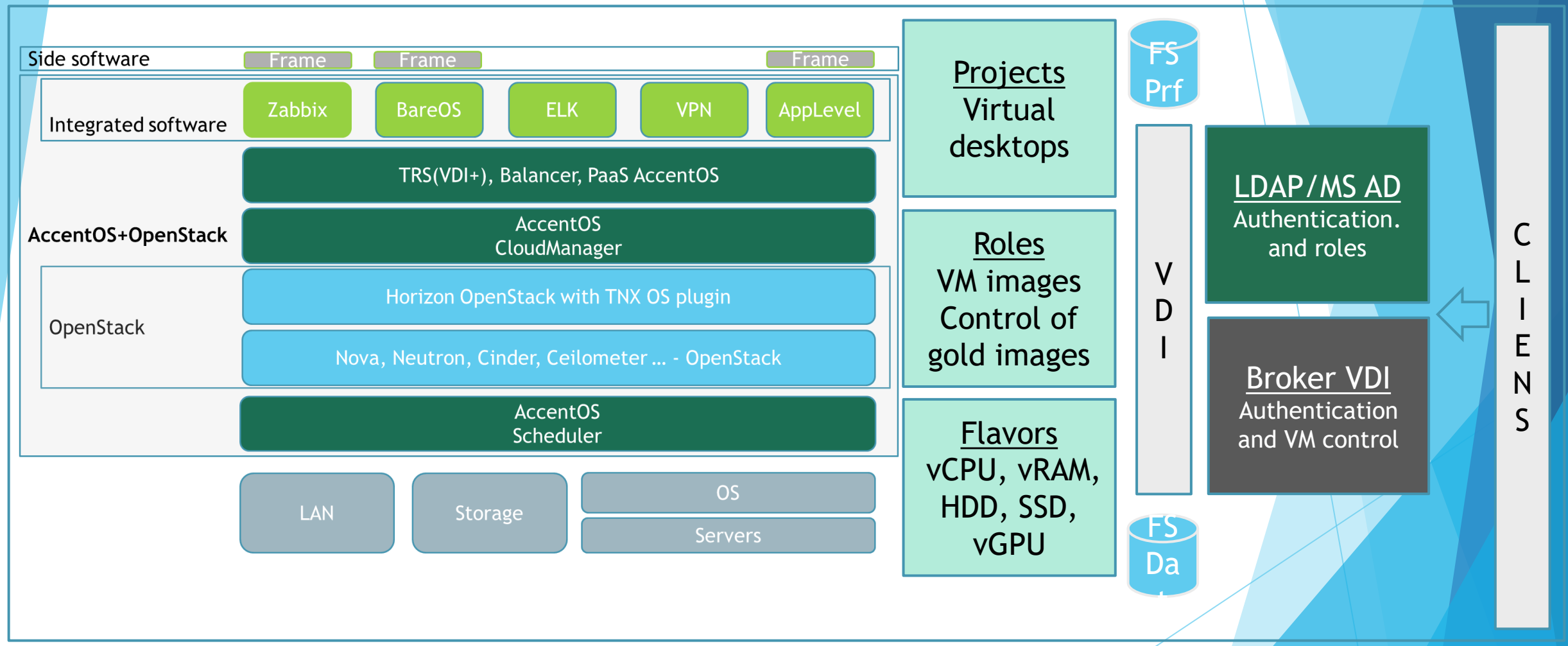
# Basement - AccentOS private cloud



# AccentOS platform



# AccentOS Virtual Desktop Infrastructure



# AccentOS features

# AccentOS Self-diagnostic

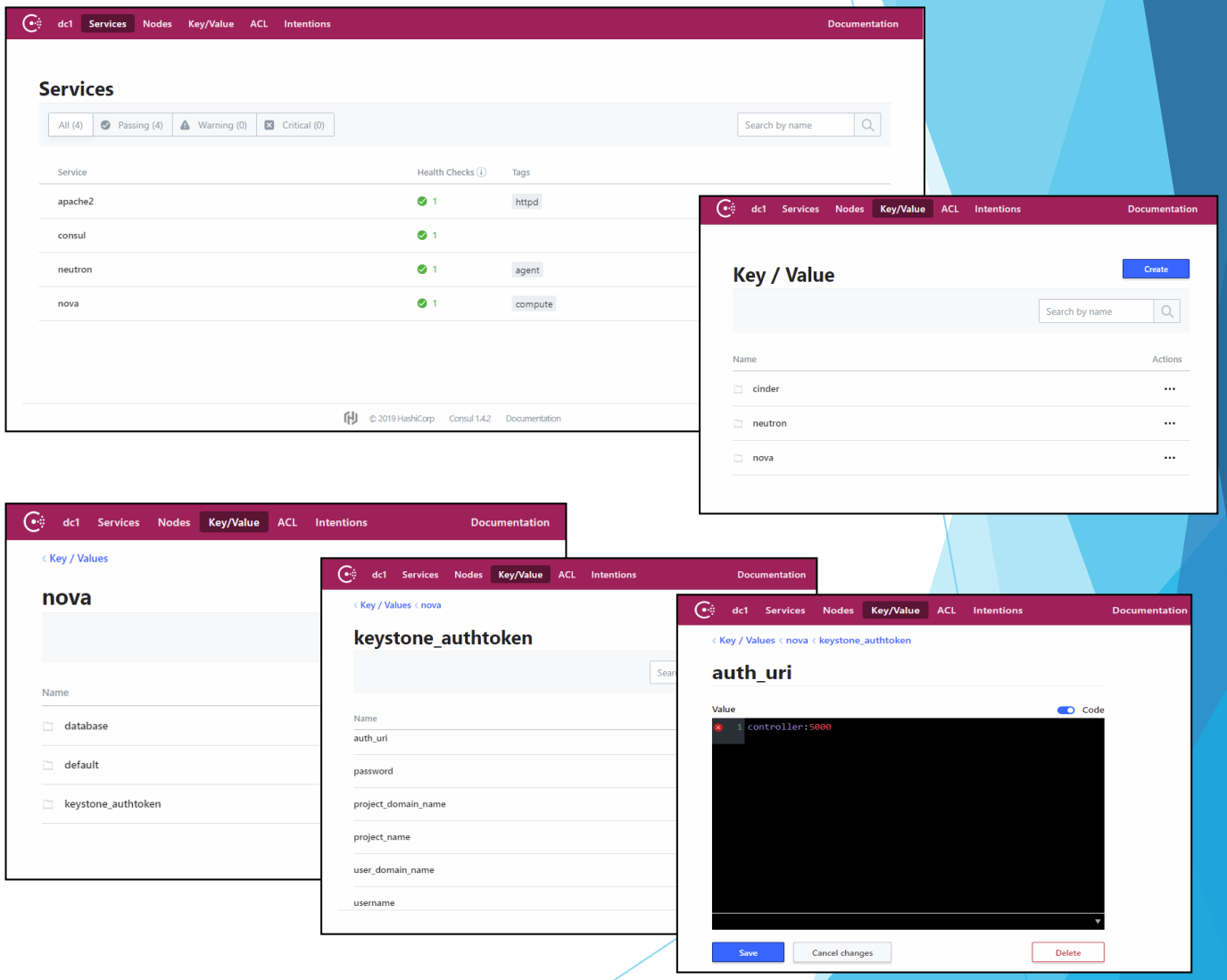
AccentOS provides self-diagnostic functionality

- Information collect  about status platform
- Data analysis to providing to specialists
- Reports generation

# One-point configuration (3Q19)

AccentOS provides configuration from one point:

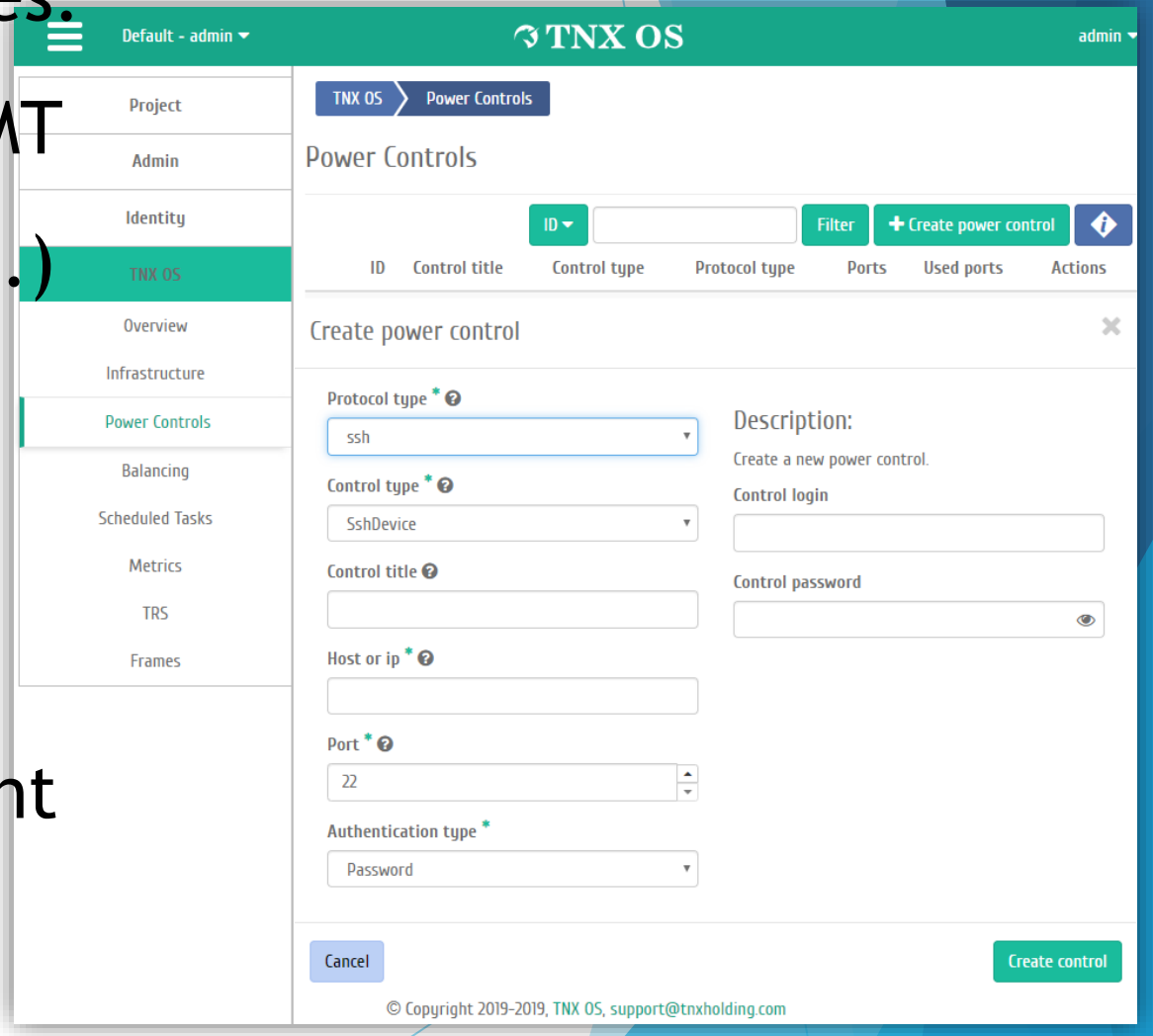
- Dynamic configuration
- Centralized parameter storage (key=value)
- Integration with Consul software



# HA for servers

AccentOS hardware HA features provides:

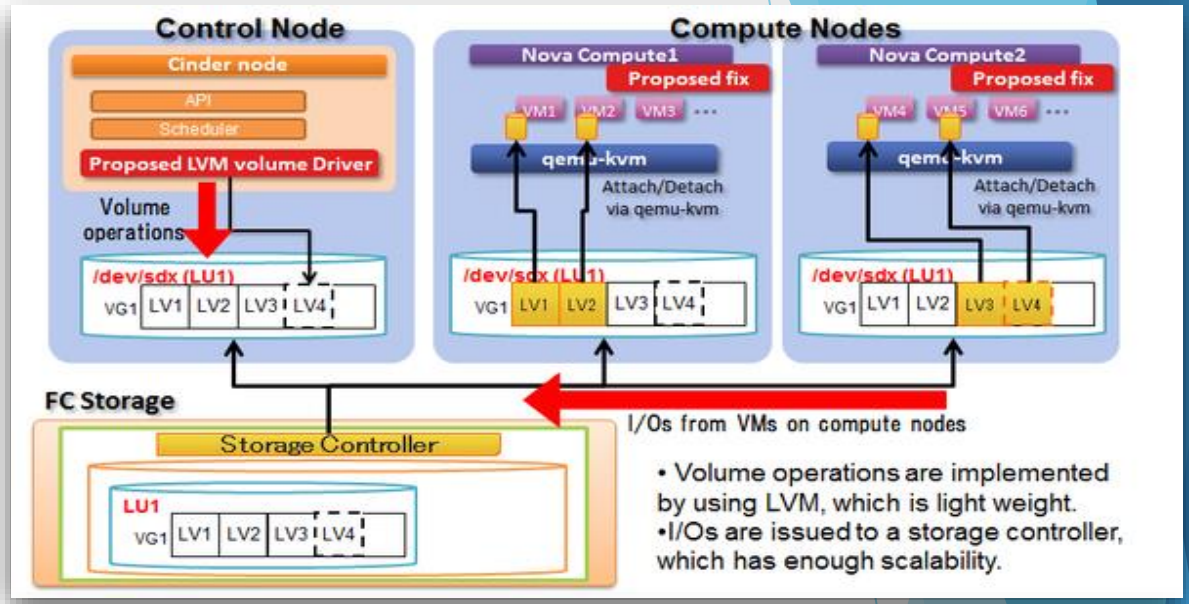
- Management hosts over IPMI, Intel AMT and SNMP (power on/off, reboot, etc.)
- Provide reserved compute node
- Move server to maintenance with VM live migration
- Automatic PXE image, CPU adjustment
- Storage heartbeat monitoring (4Q19)
- Schedule hosts with calendar

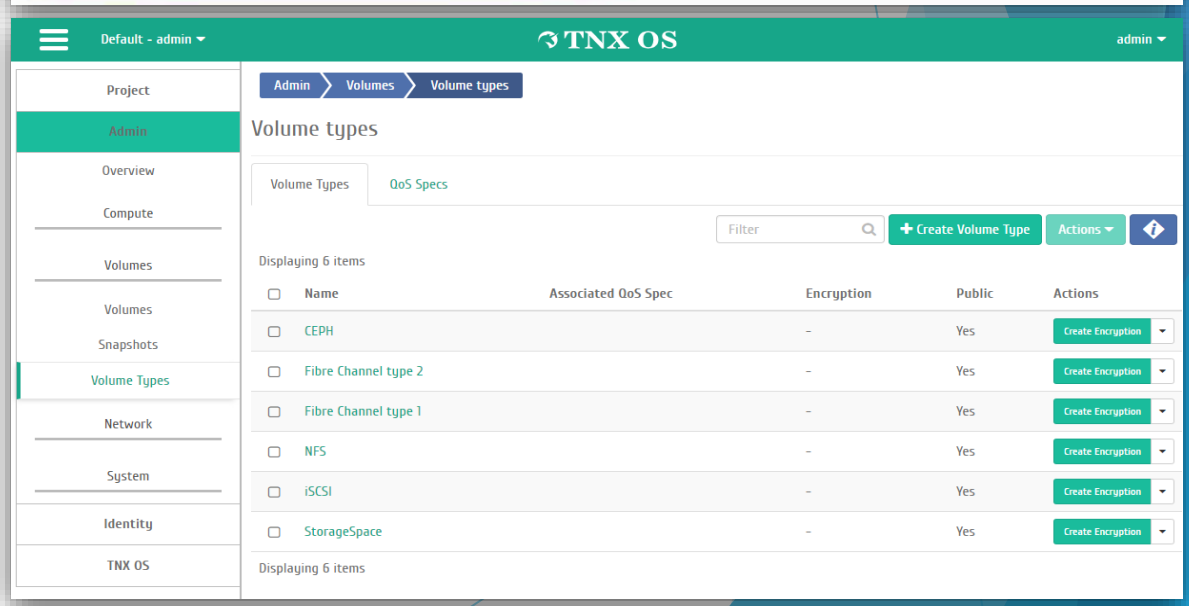


# Storage Space (4Q19)

AccentOS provides unified datastore

The Sanlock daemon manages leases for applications running on a cluster of hosts with shared storage. All lease management and coordination is done through reading and writing blocks on the shared storage.

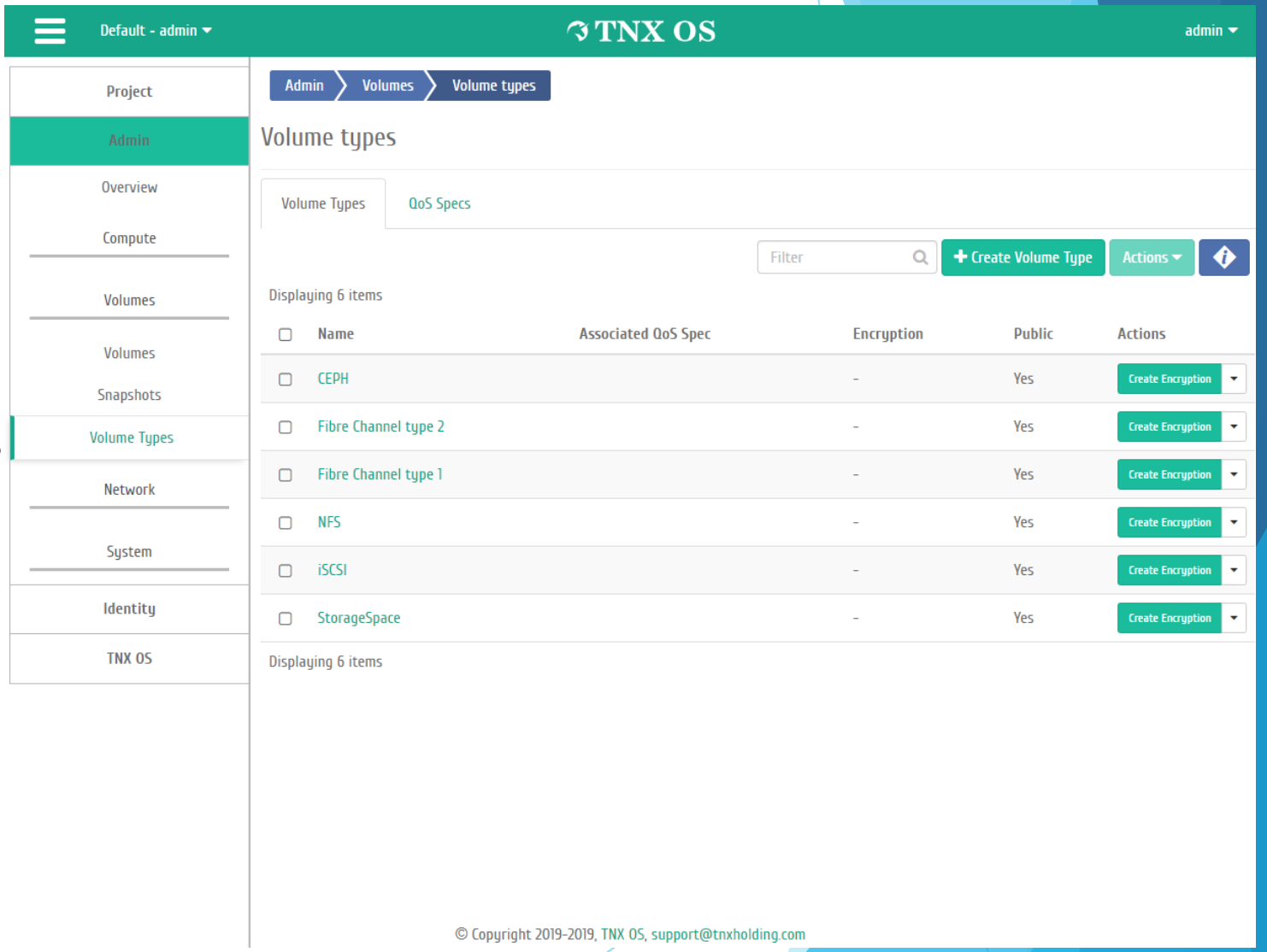


# SDS Ceph additional functions

AccentOS provides Ceph functionality

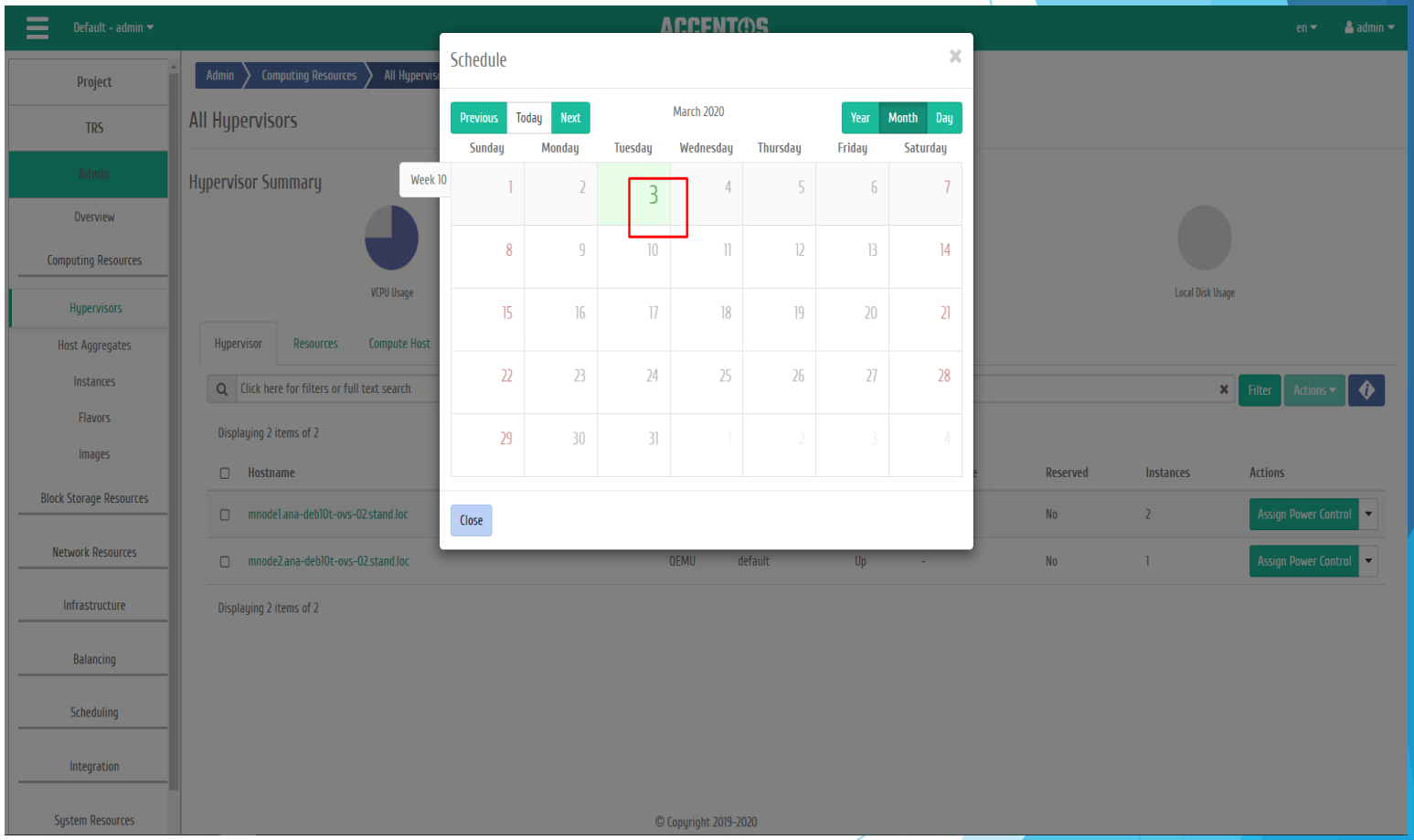
- Hot-swap HDDs at OSD node
- Customized pools for clients
- CloudManager API to Ceph Crushmap for Geocluster (4Q19)



# AccentOS Scheduler

AccentOS provides Scheduler

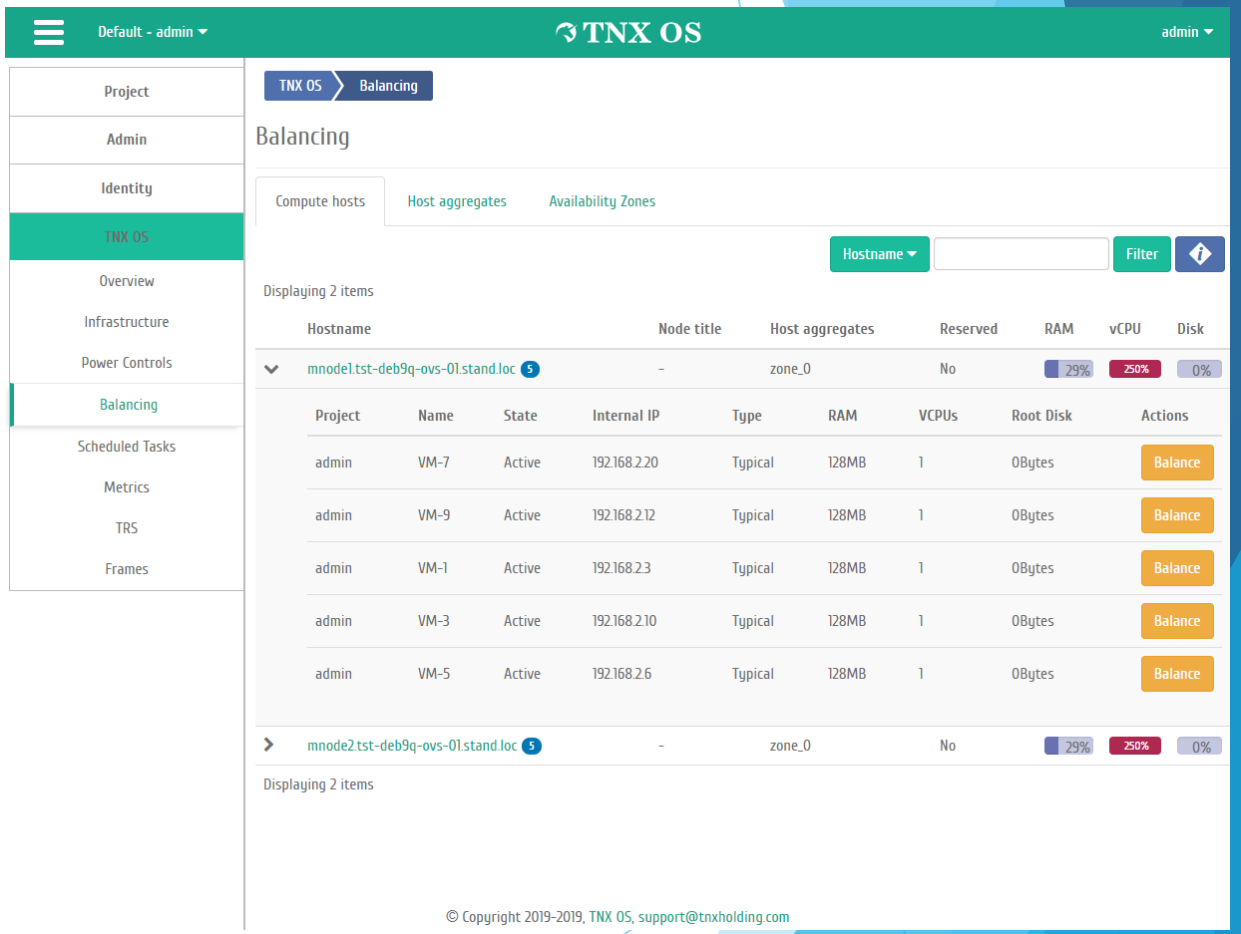
- Deferred action planner
- Repeating Task Scheduler
- Automation



# DRS

AccentOS provides load balancing

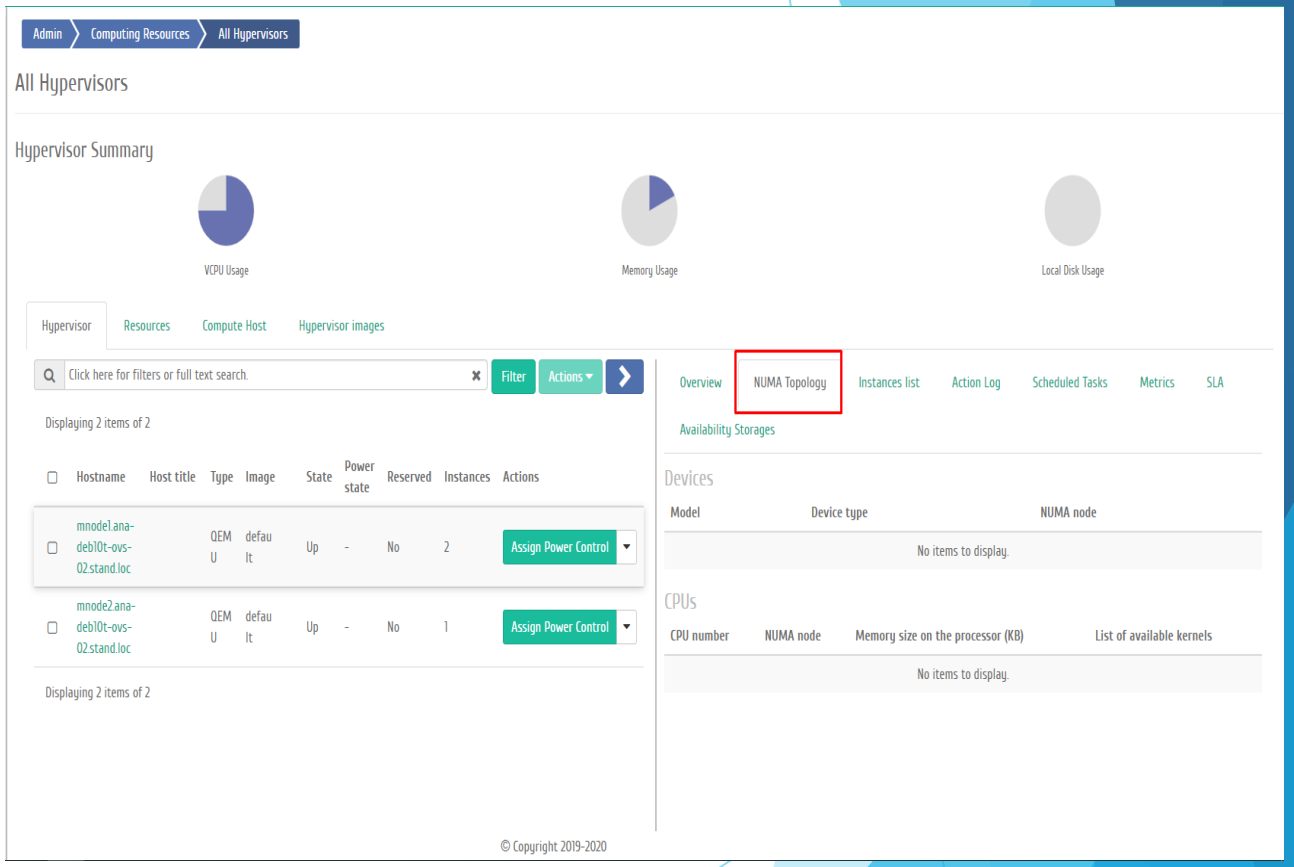
- For VMs in aggregates of hosts
- With account of real CPU, RAM
- With behavior (norm/noisy/quiet)
- With auto/manual/time-define modes



# NUMA

AccentOS provides distribution of VMs in the host with NUMA

- Account type and number of CPUs at the host (3Q19)
- Distribution/default mode (3Q19)
- Collect metrics of host (4Q19)
- Choose best mode to start VM according it node (4Q19)
- Integration DRS-NUMA (4Q19)



# Multiple volume connection

AccentOS expands features of OpenStack providing connection of single block device to many VMs in configurations:

- With cluster filesystems - OCFS2, GFS2, etc.
- In RW mode for master VM and RO mode for other VMs

# Live migration for storage block devices

AccentOS lets to migrate block and file volumes between storages in live migration mode:

- With different interfaces iSCSI, FC, Ceph
- Between different types of storages (SAS, SATA)
- Between different pools
- Between different storages

# Agentless backup of block devices

AccentOS has agentless backup of block devices - Cinder backup that allows:

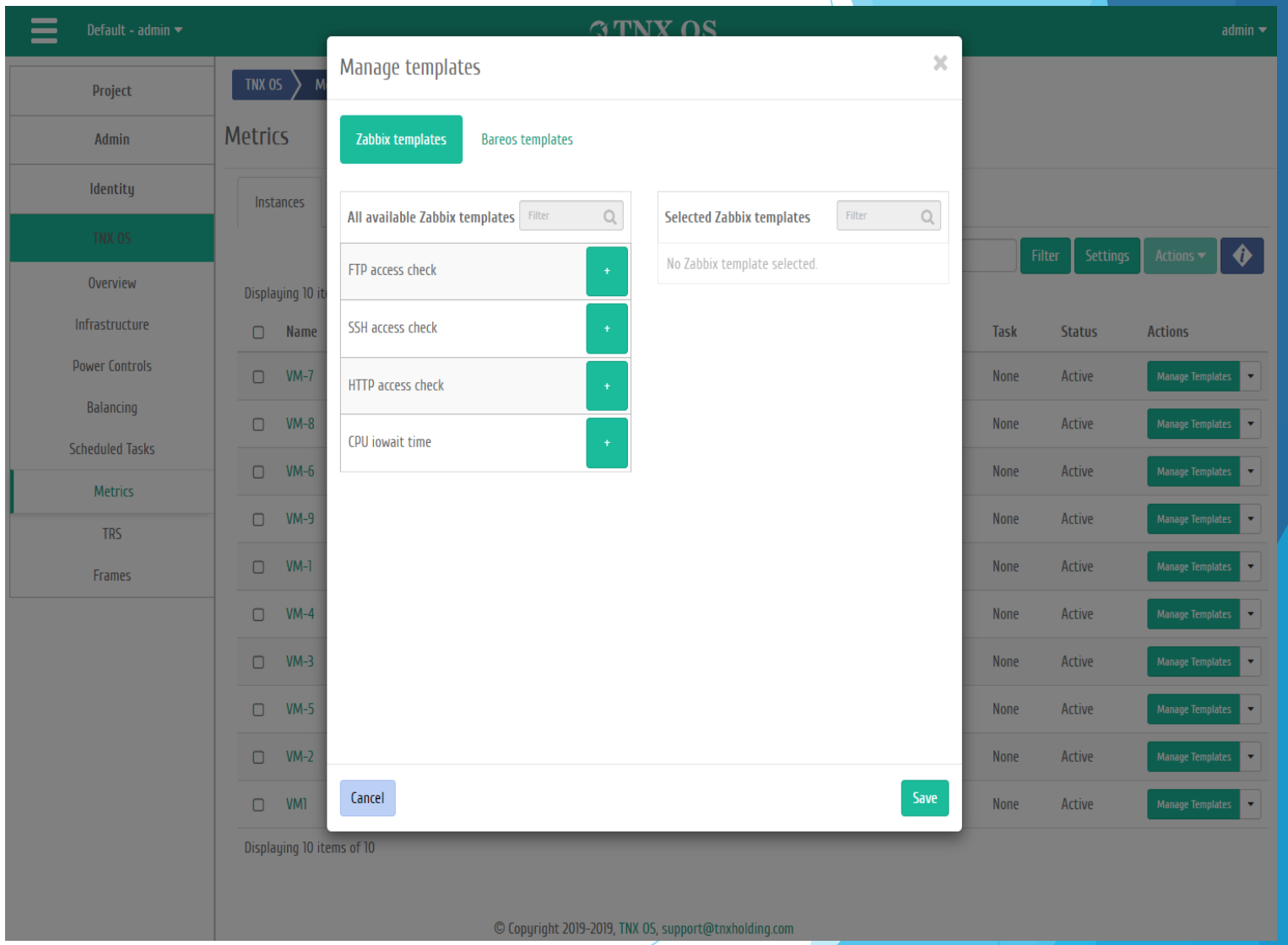
- Create volume snapshots to magnetic tape
- Restore snapshots from type to any date.

# HA for VMs- restart

AccentOS provides HA functionality at hypervisor level.

AccentOS module provides:

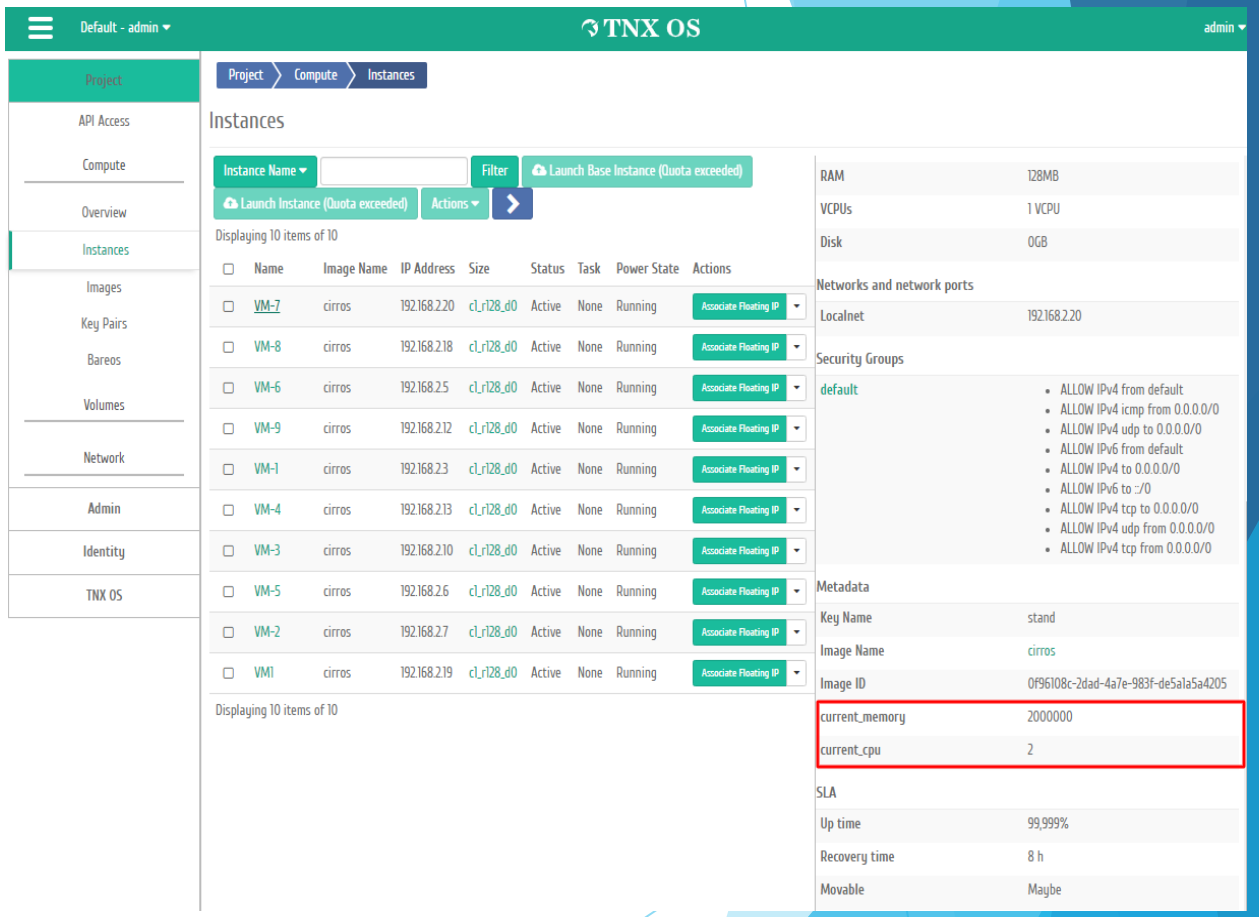
- Management VMs over SNMP agent and Zabbix of service provider
- Schedule VMs with calendar
- Supported VMs migrations
  - live migration
  - migration
  - evacuation



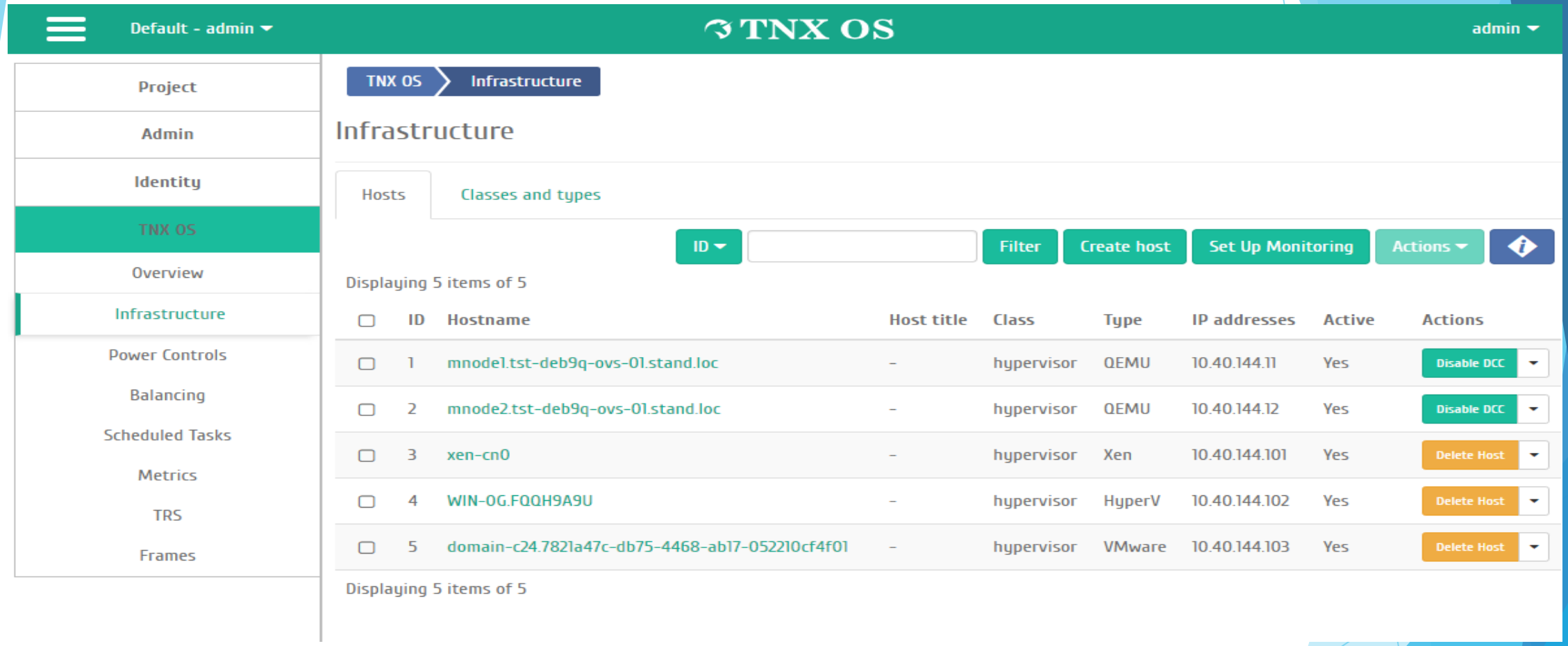
# Resize features

AccentOS Agent module has hot-plug features to resize VM

- Dynamic resize of RAM
- Dynamic resize of volumes
- Dynamic resize of CPU cores
- QoS for CPU



# Multiple hypervisors support




AccentOS has unified model to control hypervisors – VSphere (requires vCenter license), Hyper-V, KVM, Virtuozzo, Xen.

# GPU virtualization support

AccentOS provides GPU virtualization for HPC, CAD/CAM, graphics desktops, VDI.

AccentOS provides GPU in vGPU mode for VMs with Linux and Windows for:

- Red Hat Enterprise Linux 7.5 and higher as GPU with Nvidia drivers
- KVM with Intel GVT-g

# AccentOS AppLevel

AccentOS AppLevel is an extension of Layer library to compile VM gold images for VDI and classical VMs

AccentOS AppLevel provides

- Control of sets of VMs gold images
- VM images compilation, refresh and updates applications, drivers, compatibility, versions, CI/CD

Components - Applayer, Makelayer и Virtlayer

- Applayer – store, control, delivery of layers for users
- Makelayer – creation of layers
- Virtlayer – gets layers from VMs and make app layers

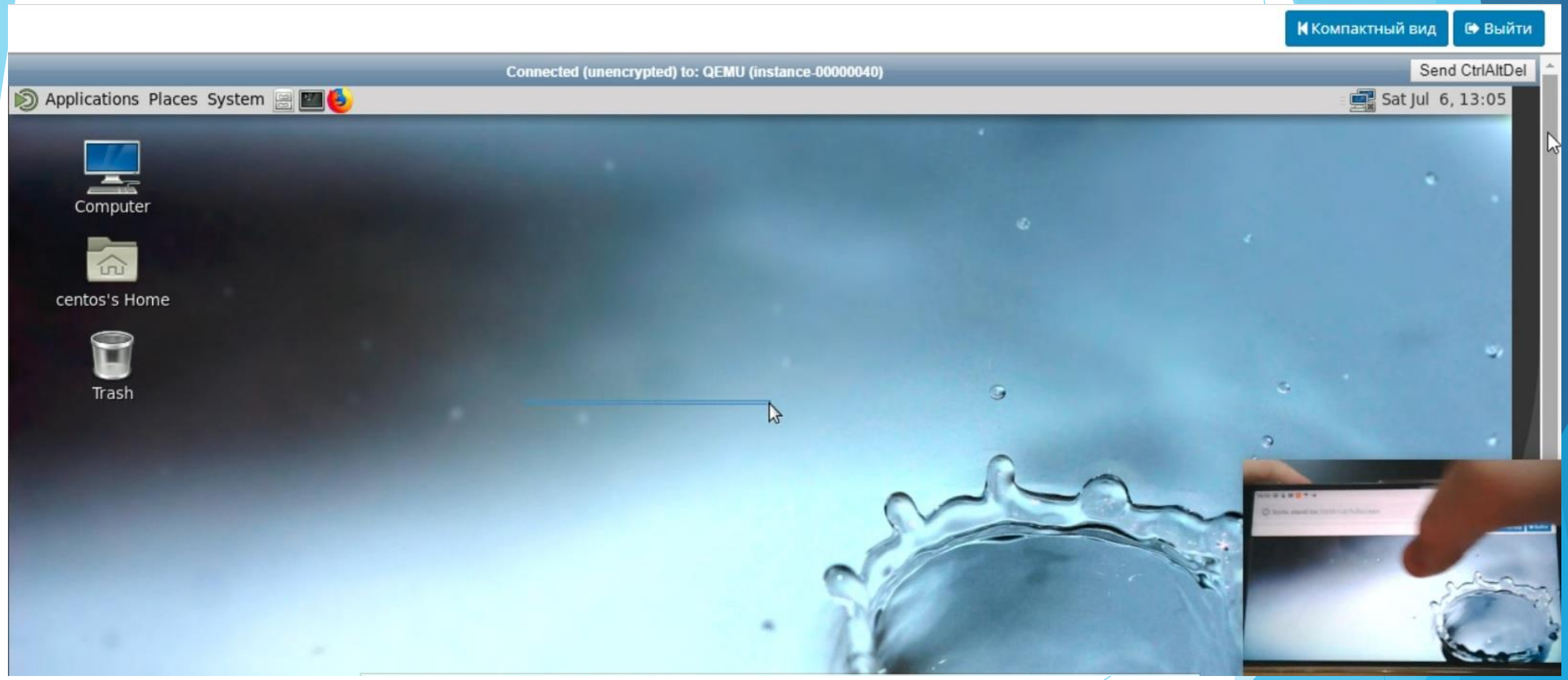
# VDI AD support

AccentOS provides :

- MS AD 2016 and higher
- Open LDAP
- SAMBA 4 in compatibility mode with MS AD 2012

# VDI mobile support

AccentOS provides :



# Events registration in guest VM

AccentOS has feature to register events from guest VM OS. This is very helpful for TRS(VDI+) VMs:

- Define user’s activity
- Register user’s login/logout time
- Equipment utilization and billing of session duration
- Licenses utilization

# Auto deploy of the platform

AccentOS provides auto deploy of platform with:

Cobbler

- For installing operating systems over PXE
- To provide PXE DHCP DNS services
- To install operating systems and products

Ansible

- For deploying and configuring OpenStack
- For deploying and configuring AccentOS
- For integration with Zabbix, ELK, BareOS

# AccentOS
# Client Services

# Shared filesystems

AccentOS provides support of centralized control to shared filesystems:

- Integration Manila into AccentOS.
- Creation and automatic configuration shared filesystems for VMs and baremetal
- Centralized creation of snapshots for network storages
- Centralized backup
- Access control and resources usage control.
- Support NFS, CIFS (for Windows), GlusterFS, HDFS (native for Hadoop), CephFS, MapRFS (for Big Data)

# Network

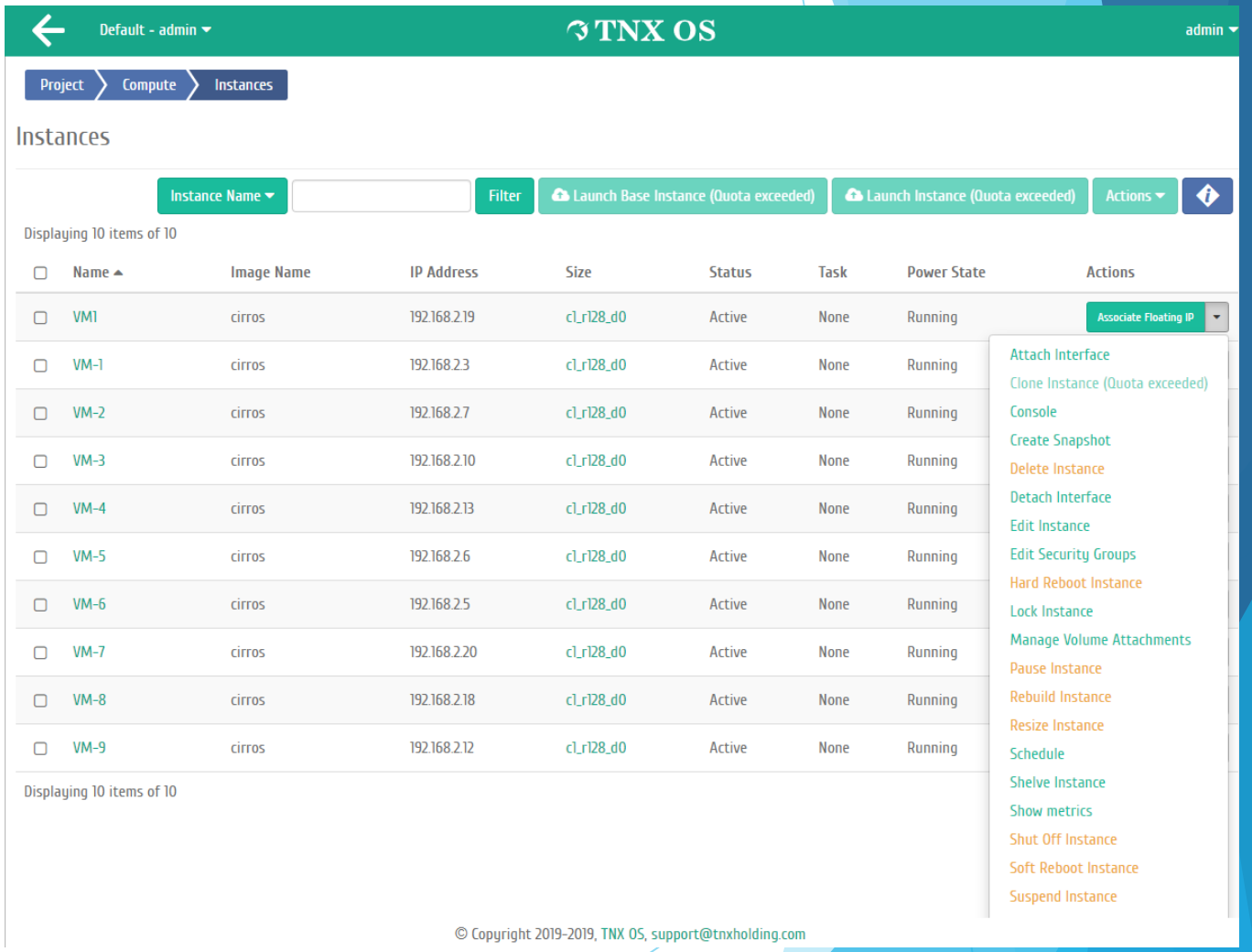
AccentOS provides :

OVN

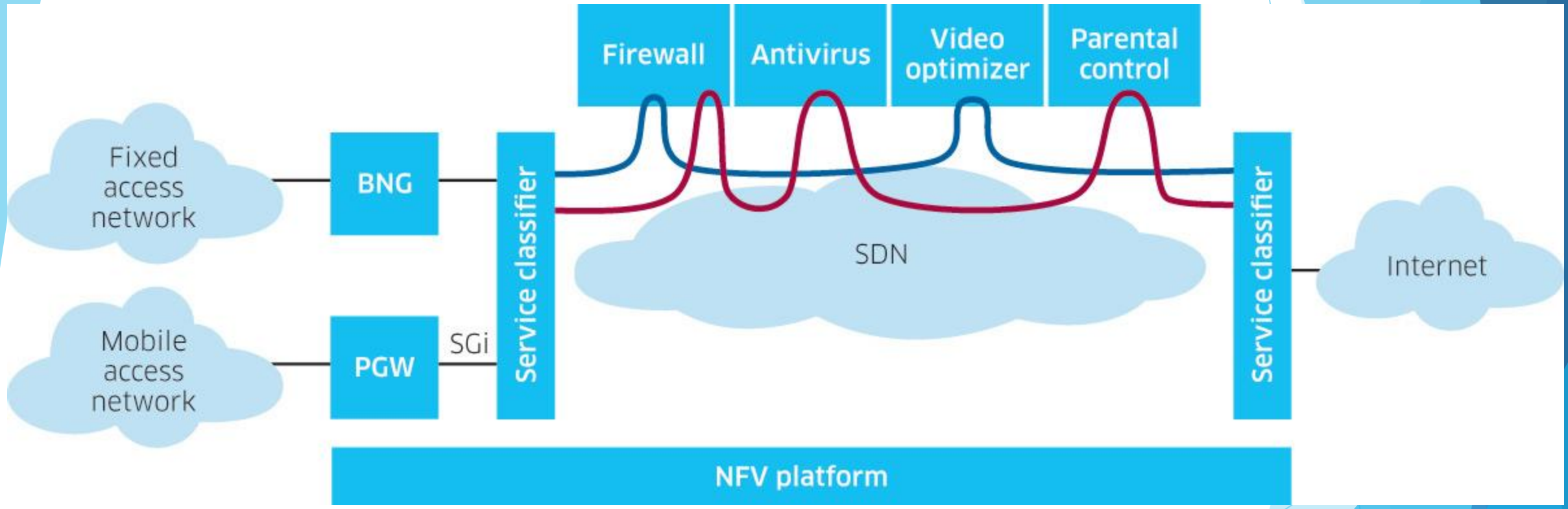
QoS, DSCP

DVR and allocation public IP for VM

VPNaaS



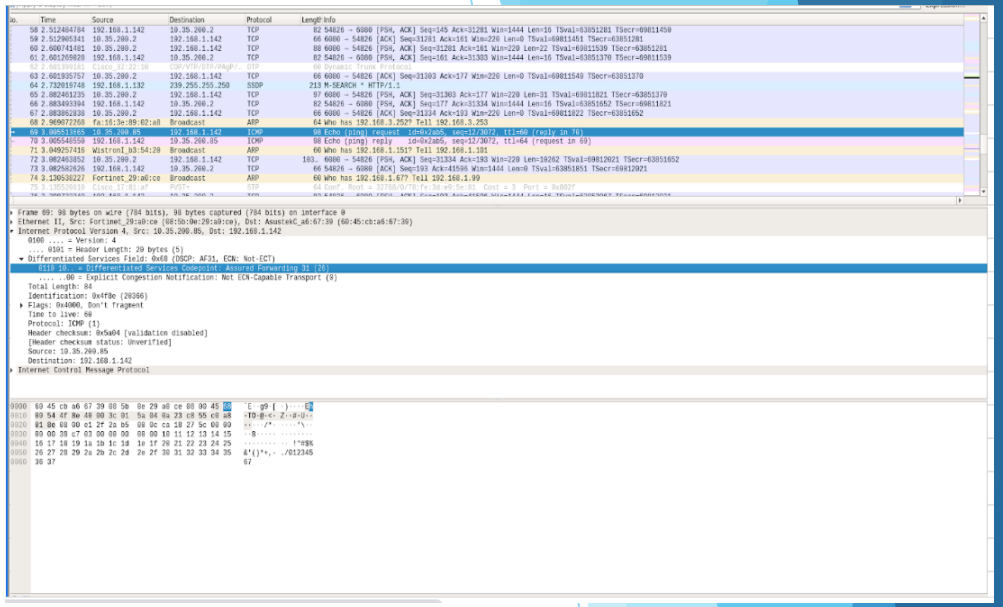
# SFC (service function chaining) support

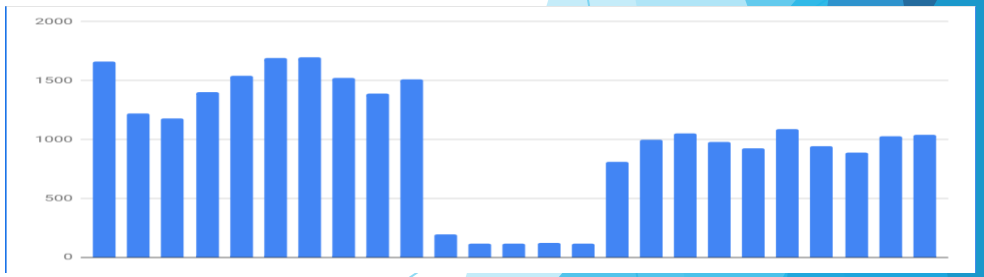


# Network QoS control

AccentOS module can control of quality characteristics in LAN, set LAN tags, mark traffic for LAN equipment.

AccentOS module can limit LAN throughput and set rules to mark traffic with DSCP-tags for all LAN infrastructure – ports of VM, virtual LANs, virtual routers





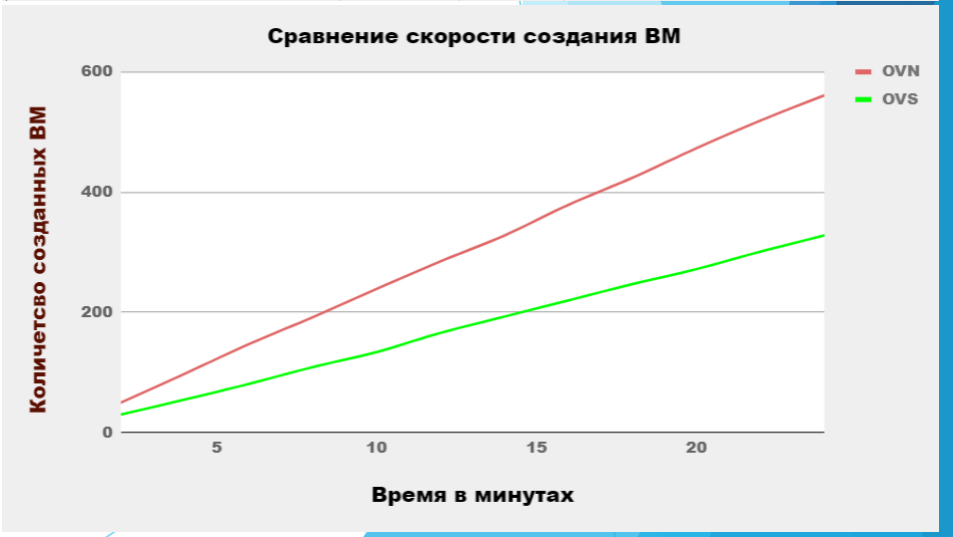
# Network control with OVN/GENEVE

AccentOS supports protocols for network control GENEVE, VxLAN, GRE

Possibilities:

- OVS, OVN
- Reduce connection time (up 30%)
- Supports connectivity of large amount of devices
- Good with IoT

| API | OVS | OVN | Результат сравнения |
|---|---|---|---|
| nova.boot_server | 18.665 | 3.761 | 79.85% |
| neutron.list_ports | 0.195 | 0.22 | -12.82% |
| neutron.list_subnets | 0.252 | 0.187 | 25.79% |
| neutron.add_interface_r | 1.698 | 1.556 | 8.36% |
| neutron.list_routers | 0.185 | 0.147 | 20.54% |
| neutron.list_networks | 0.21 | 0.174 | 17.14% |
| neutron.list_security_gr | 0.132 | 0.184 | -39.39% |
| neutron.remove_interfac | 1.557 | 1.057 | 32.11% |
| neutron.create_port | 0.58 | 0.614 | -5.86% |
| neutron.create_subnet | 0.42 | 0.416 | 0.95% |
| neutron.delete_port | 0.464 | 0.46 | 0.86% |
| neutron.create_security | 0.081 | 0.094 | -16.05% |
| neutron.create_network | 0.113 | 0.179 | -58.41% |
| neutron.create_router | 0.077 | 0.053 | 31.17% |
| neutron.delete_security | 0.092 | 0.104 | -13.04% |



# Container virtualization support

AccentOS has unified mechanism to control hypervisors and containers.

Both types of virtualization can work at one platform at one time.

AccentOS grants feature to get image of container from OpenStack - Glance, and from DockerHub.

# AccentOS
# Development process

# Software development process












Analysis and Design → Development → Testing → Deploy





# Quality Assurance

Types of Tests

- Unit tests
- Codestyle checks
- Functional tests
- Integration tests
- Load testing

# Thank you!