

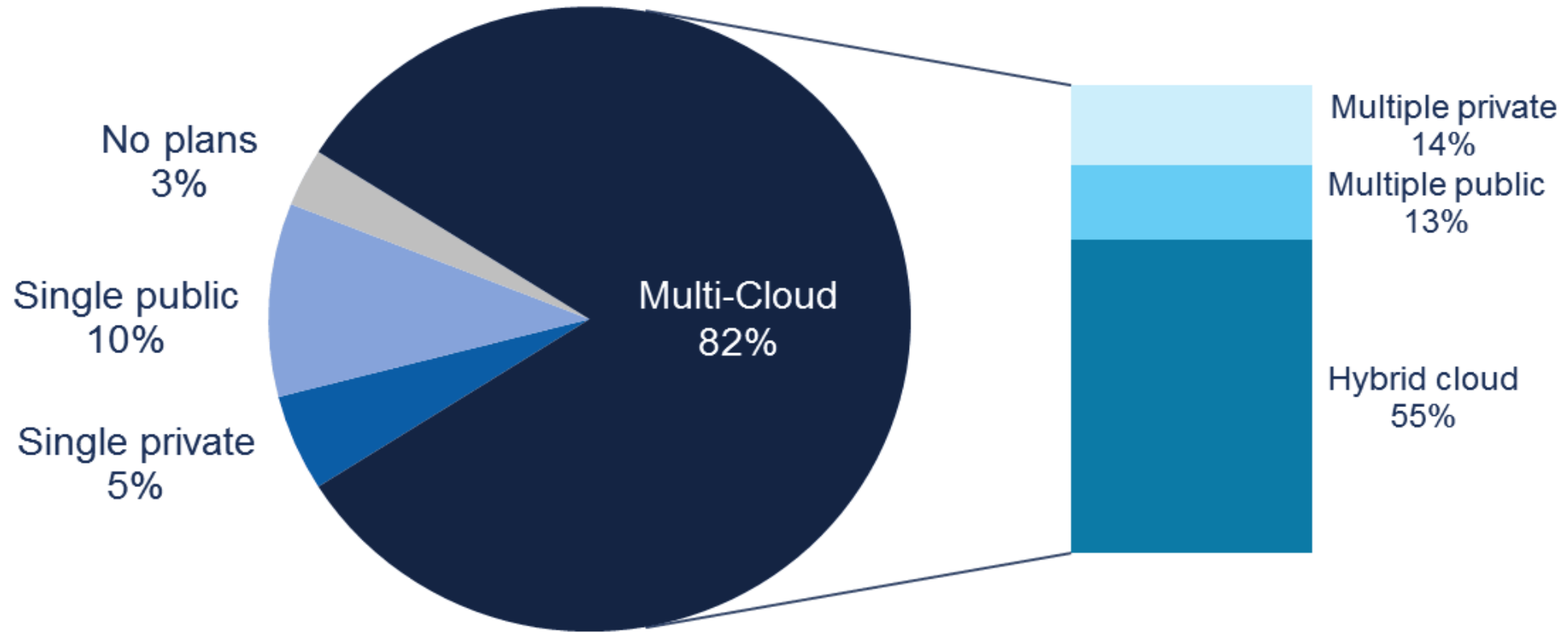
AccentOS Cloud platform

About company

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

Enterprise Cloud Strategy

1000+ employees



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 and terminal clients
 - Unified storage
 - Integration with enterprise storages
-

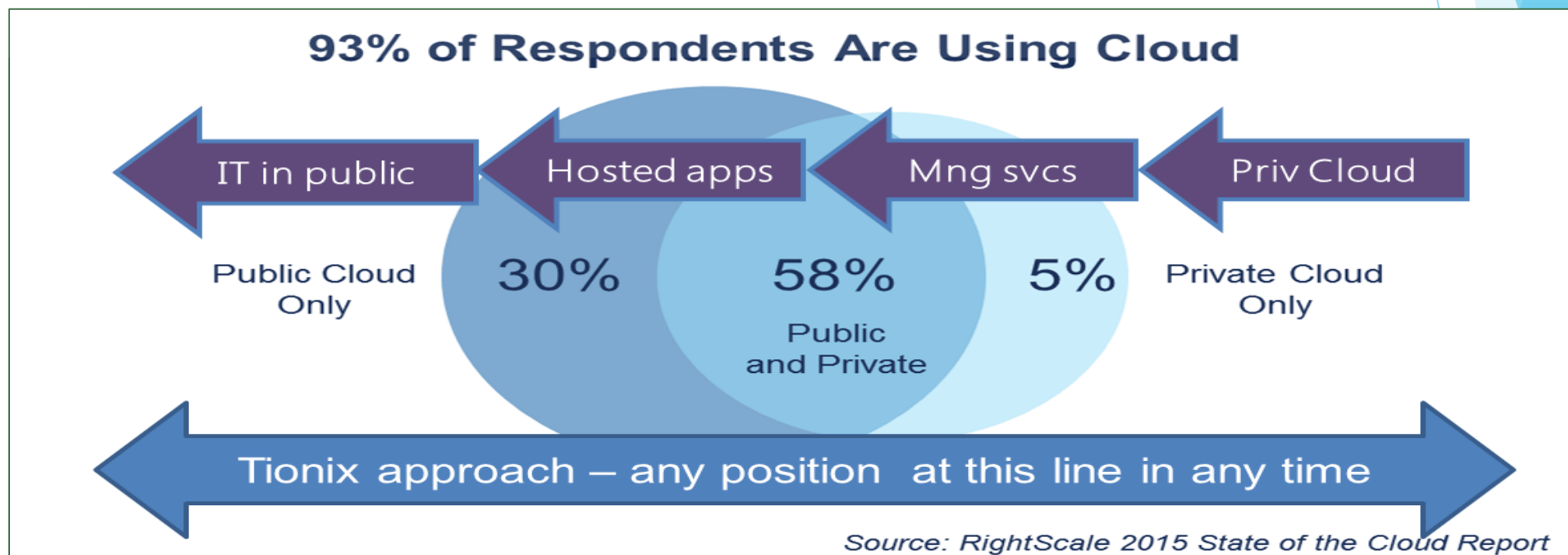
AccentOS Customer flexibility

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

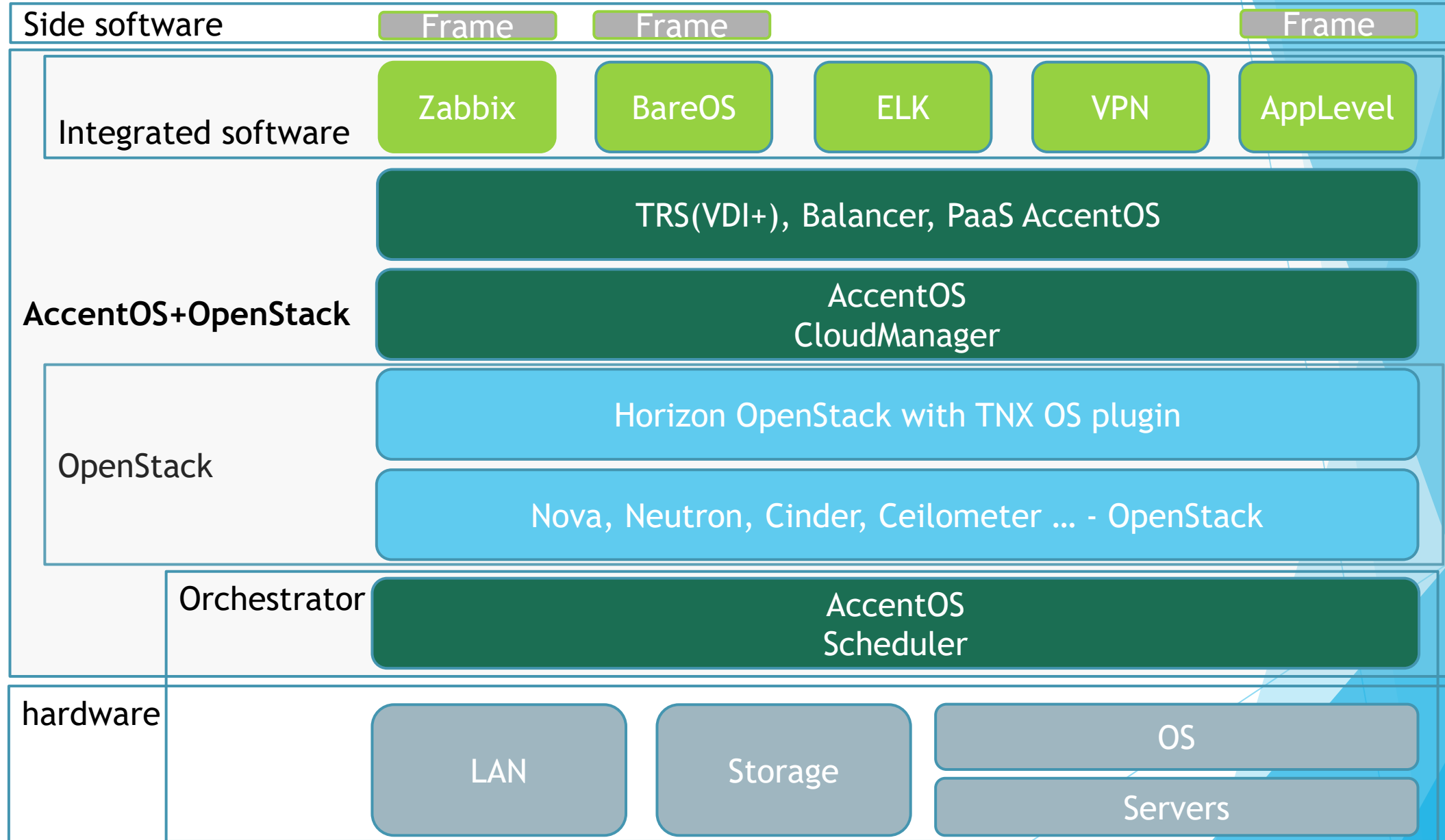
A lot of configuration parameters and files in
OpenStack and LAN

Too many OpenStack integrations with third party
products

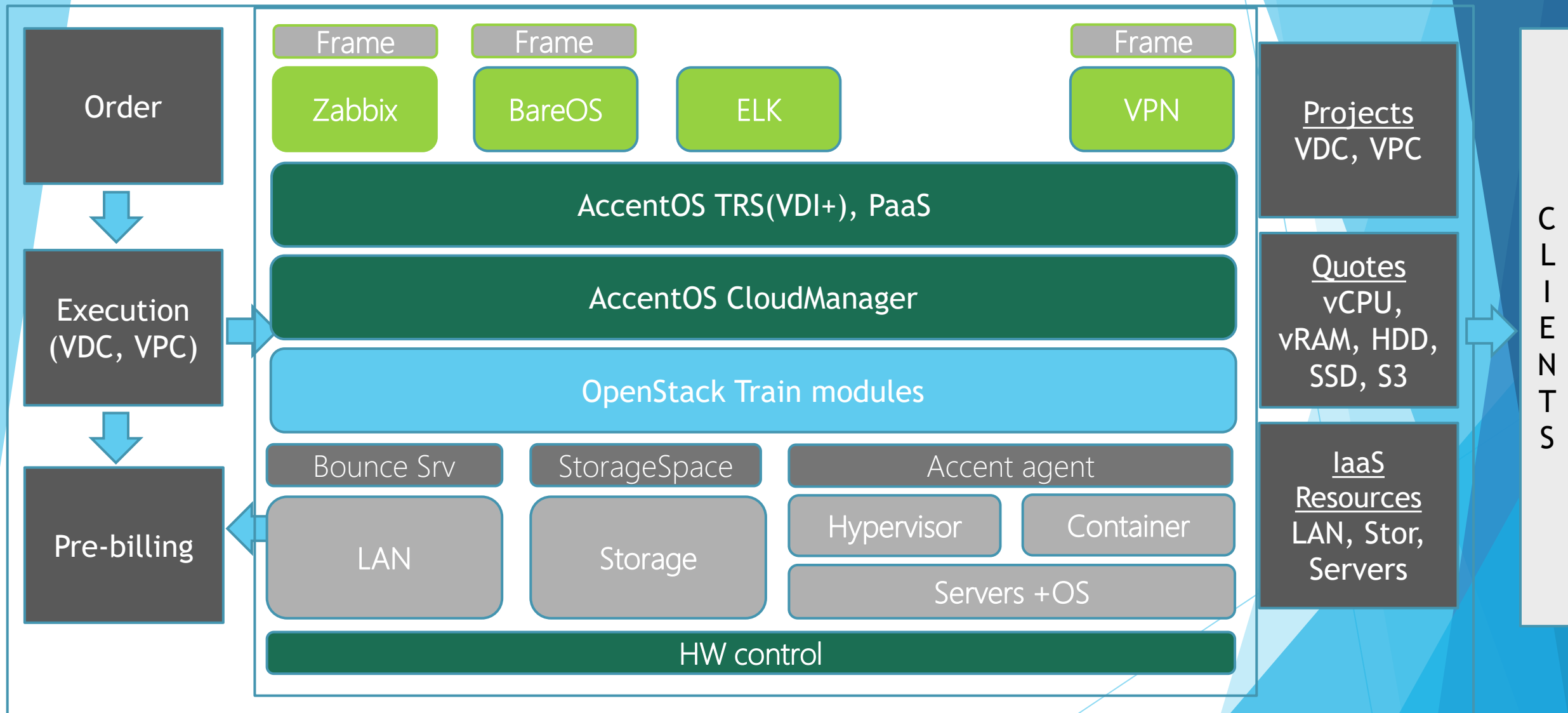
Storage (Ceph) has a medium performance

AccentOS Architecture

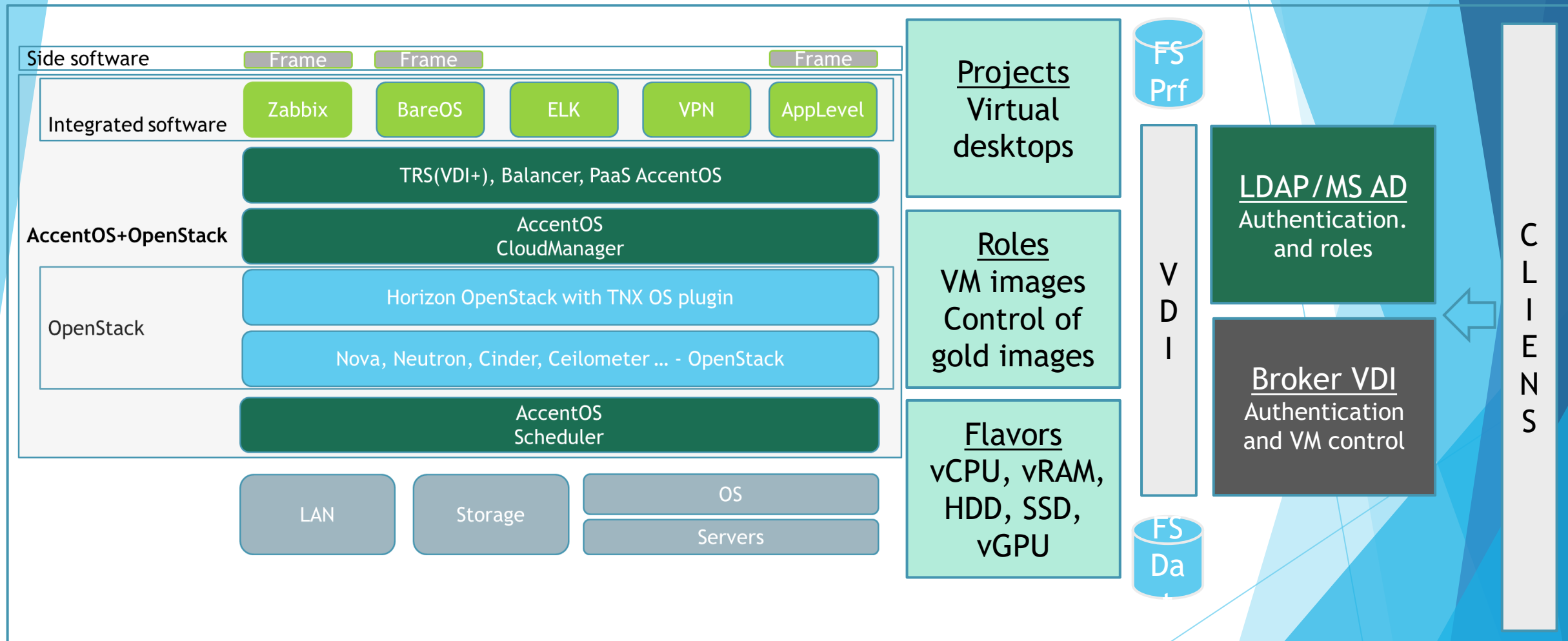
Basement - AccentOS private cloud



AccentOS platform



AccentOS Virtual Desktop Infrastructure

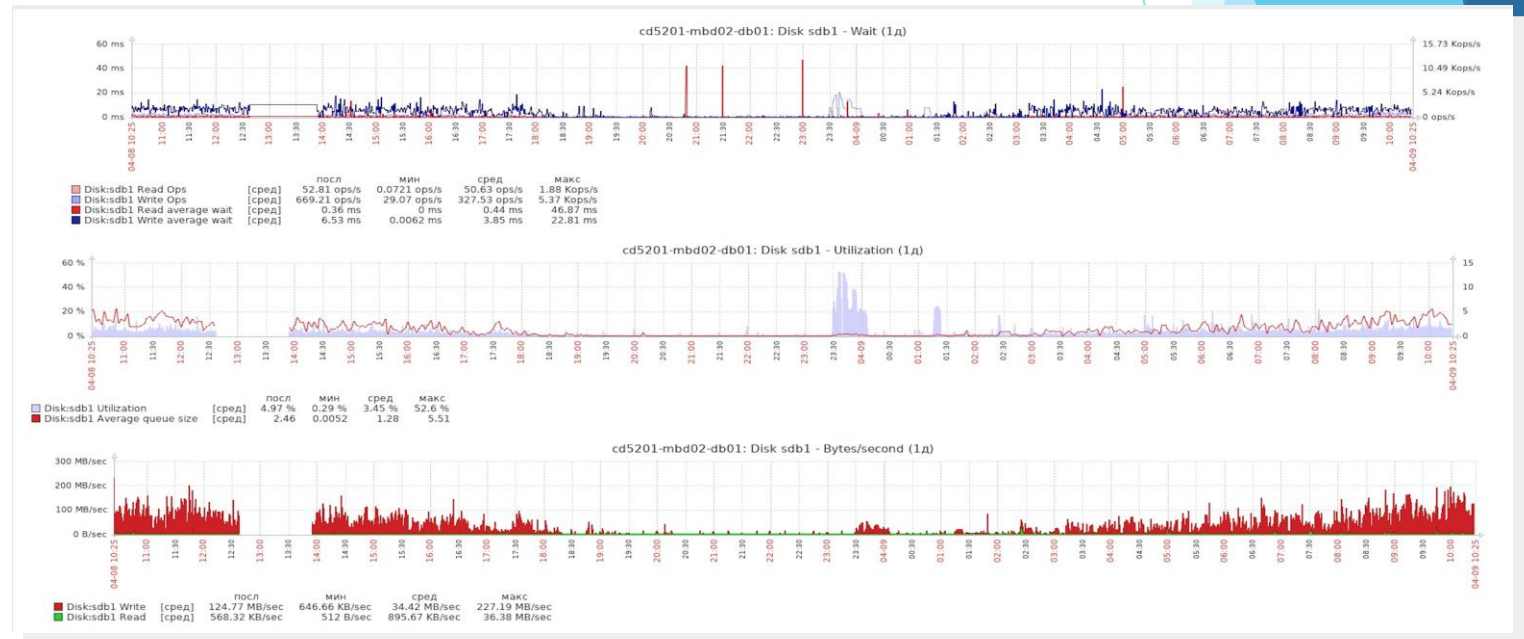


AccentOS features

AccentOS Self-diagnostic

AccentOS provides self-diagnostic functionality

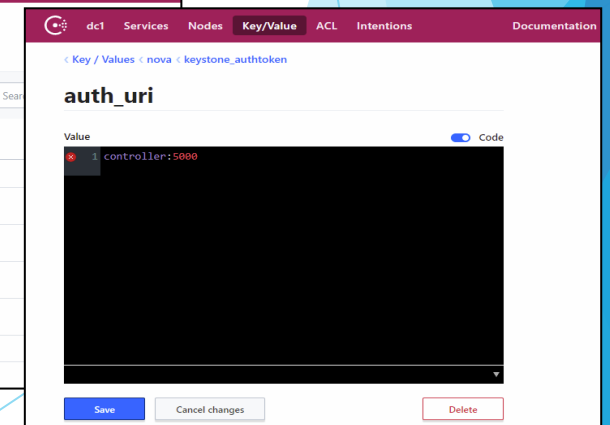
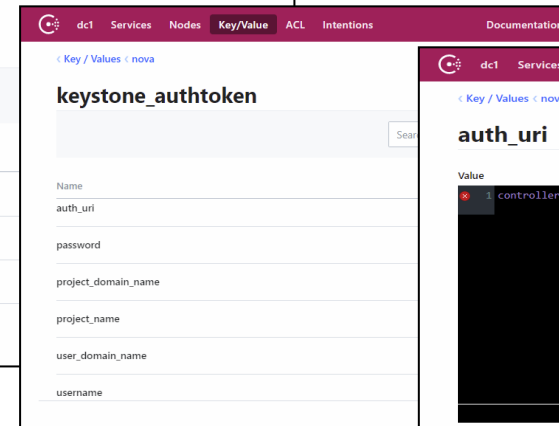
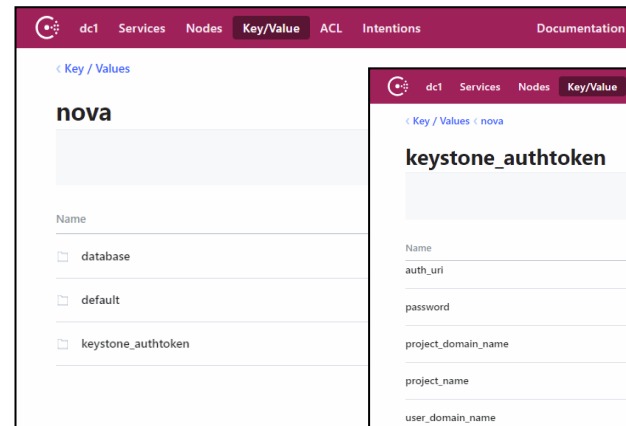
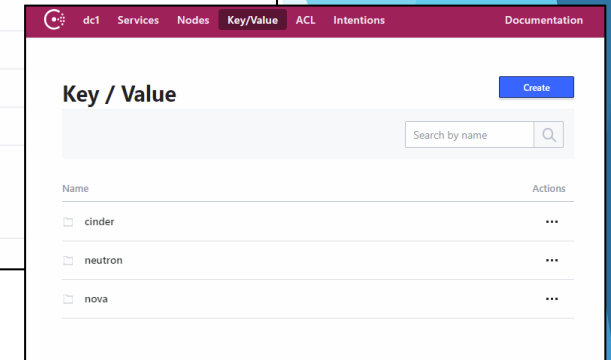
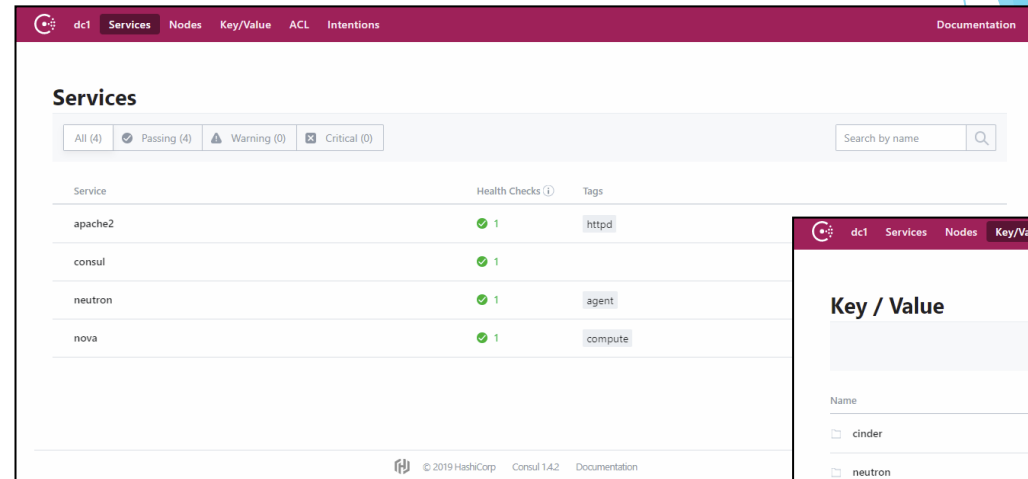
- Information collect about status platform
- Data analysis to providing to specialists
- Reports generation



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

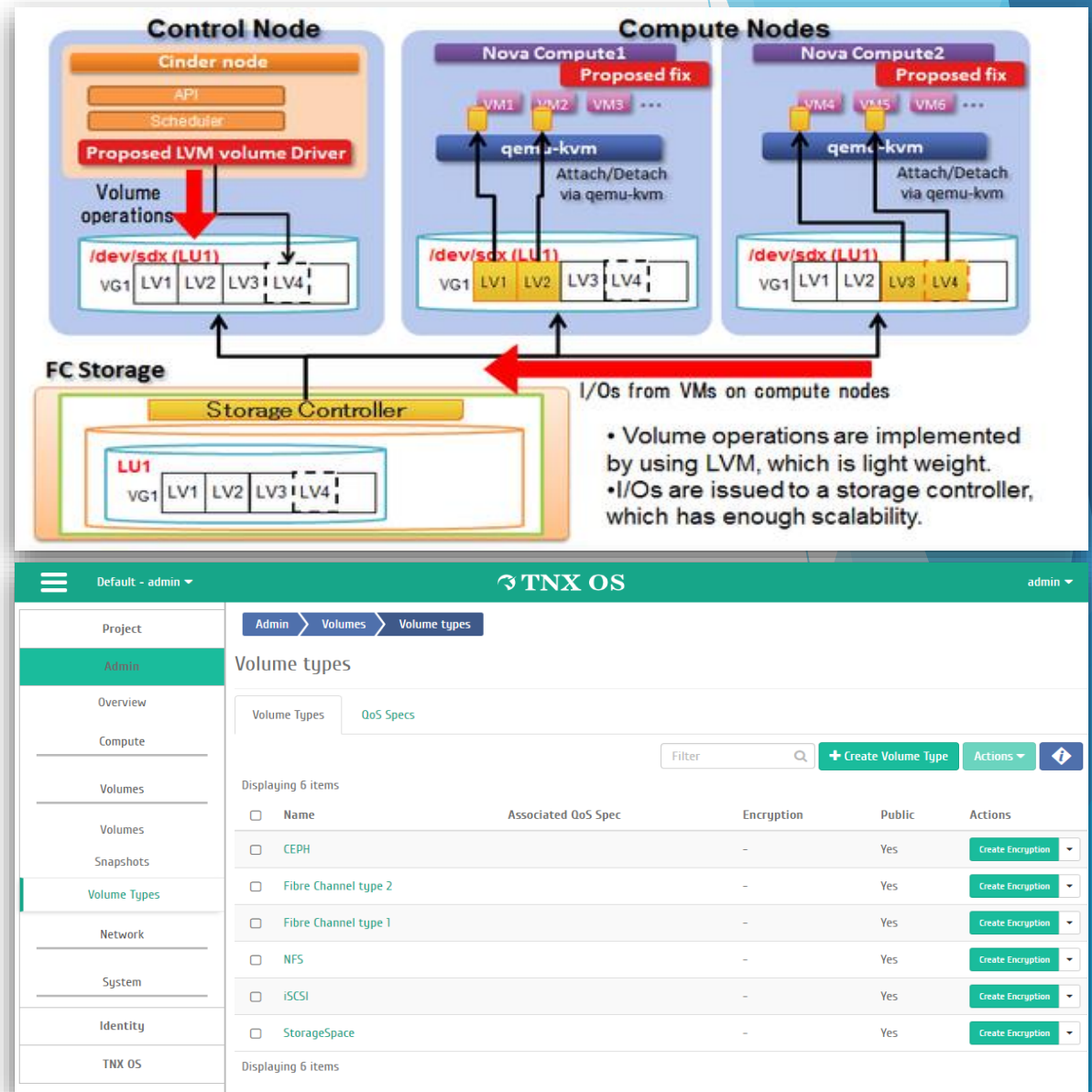
The screenshot displays the TNX OS web interface. On the left is a sidebar menu with options: Project, Admin, Identity, TNX OS (selected), Overview, Infrastructure, Power Controls (highlighted), Balancing, Scheduled Tasks, Metrics, TRS, and Frames. The main content area is titled 'Power Controls' and includes a '+ Create power control' button. Below this is a table with columns: ID, Control title, Control type, Protocol type, Ports, Used ports, and Actions. A 'Create power control' modal form is open, containing the following fields:

- Protocol type: dropdown menu with 'ssh' selected.
- Control type: dropdown menu with 'SshDevice' selected.
- Control title: empty text input field.
- Host or ip: empty text input field.
- Port: dropdown menu with '22' selected.
- Authentication type: dropdown menu with 'Password' selected.
- Description: text area with the placeholder 'Create a new power control.'
- Control login: empty text input field.
- Control password: empty password input field with a toggle icon.

At the bottom of the modal are 'Cancel' and 'Create control' buttons. A footer note reads: '© Copyright 2019-2019, TNX OS, support@tnxholding.com'.

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)

The screenshot displays the TNX OS Admin interface. The top navigation bar is green with the TNX OS logo and the user 'admin'. The left sidebar contains a menu with options: Project, Admin (highlighted), Overview, Compute, Volumes, Snapshots, Volume Types (highlighted), Network, System, Identity, and TNX OS. The main content area shows the 'Volume types' configuration page. It includes a breadcrumb trail: Admin > Volumes > Volume types. Below this, there are tabs for 'Volume Types' and 'QoS Specs'. A search filter and a '+ Create Volume Type' button are present. A table lists 6 volume types, each with a checkbox, name, associated QoS spec, encryption status, public status, and an 'Actions' dropdown menu containing 'Create Encryption'. The table data is as follows:

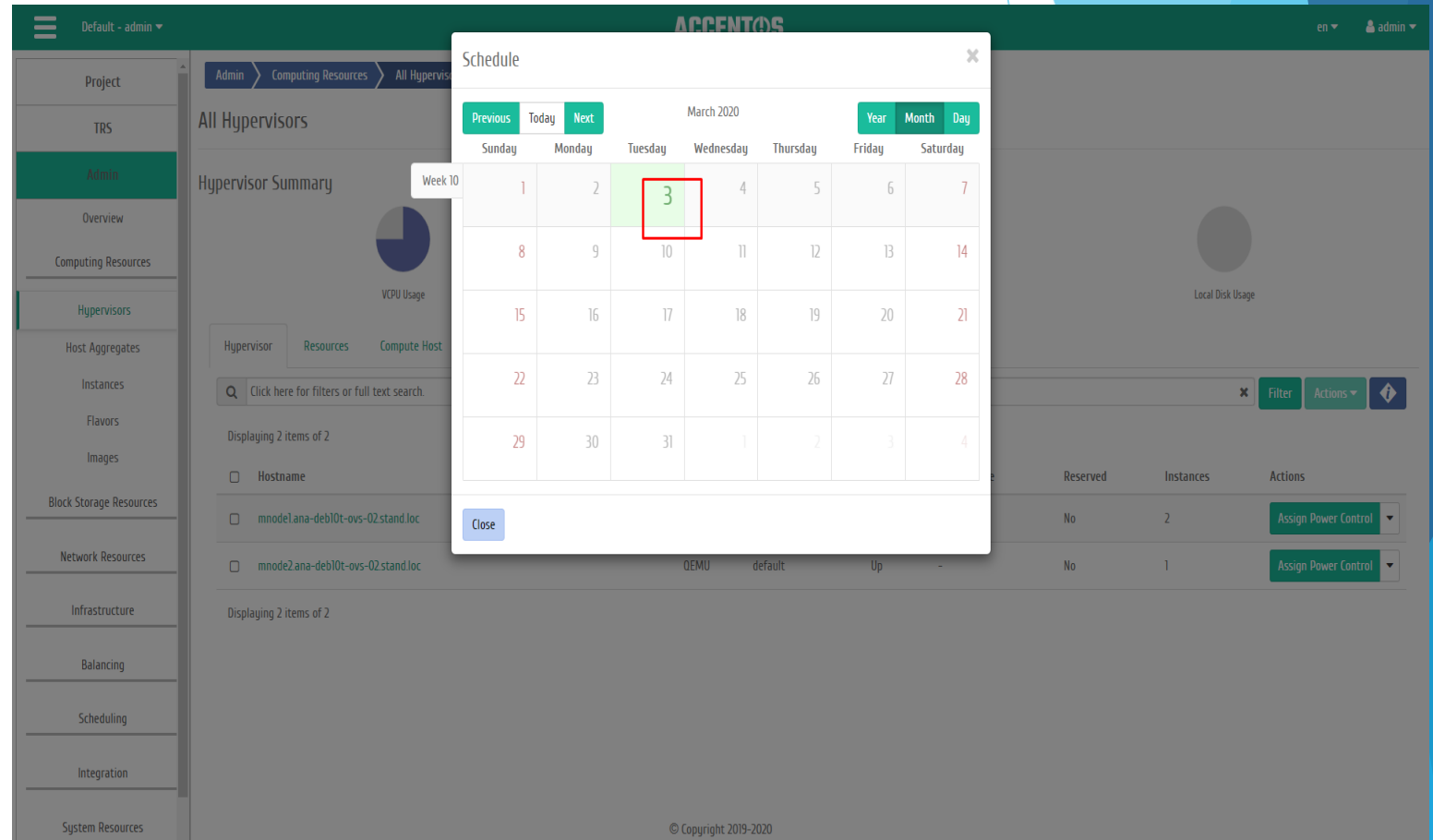
<input type="checkbox"/>	Name	Associated QoS Spec	Encryption	Public	Actions
<input type="checkbox"/>	CEPH		-	Yes	Create Encryption
<input type="checkbox"/>	Fibre Channel type 2		-	Yes	Create Encryption
<input type="checkbox"/>	Fibre Channel type 1		-	Yes	Create Encryption
<input type="checkbox"/>	NFS		-	Yes	Create Encryption
<input type="checkbox"/>	iSCSI		-	Yes	Create Encryption
<input type="checkbox"/>	StorageSpace		-	Yes	Create Encryption

At the bottom of the page, a copyright notice reads: © Copyright 2019-2019, TNX OS, support@tnxholding.com

AccentOS Scheduler

AccentOS provides Scheduler

- Deferred action planner
- Repeating Task Scheduler
- Automation



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

The screenshot displays the TNX OS Balancing interface. The left sidebar contains a navigation menu with options: Project, Admin, Identity, TNX OS (selected), Overview, Infrastructure, Power Controls, Balancing, Scheduled Tasks, Metrics, TRS, and Frames. The main content area is titled 'Balancing' and includes tabs for 'Compute hosts', 'Host aggregates', and 'Availability Zones'. A search bar with 'Hostname' and a 'Filter' button is present. Below the search bar, it says 'Displaying 2 items'. The first item is expanded, showing a table of VMs:

Project	Name	State	Internal IP	Type	RAM	VCPUs	Root Disk	Actions
admin	VM-7	Active	192.168.2.20	Typical	128MB	1	0Bytes	<button>Balance</button>
admin	VM-9	Active	192.168.2.12	Typical	128MB	1	0Bytes	<button>Balance</button>
admin	VM-1	Active	192.168.2.3	Typical	128MB	1	0Bytes	<button>Balance</button>
admin	VM-3	Active	192.168.2.10	Typical	128MB	1	0Bytes	<button>Balance</button>
admin	VM-5	Active	192.168.2.6	Typical	128MB	1	0Bytes	<button>Balance</button>

Below the table, the second item is partially visible, showing similar resource usage metrics (RAM: 29%, vCPU: 250%, Disk: 0%). The footer of the interface includes the copyright notice: '© Copyright 2019-2019, TNX OS, support@tnxholding.com'.

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)

Admin > Computing Resources > All Hypervisors

All Hypervisors

Hypervisor Summary

VCPU Usage Memory Usage Local Disk Usage

Hypervisor Resources Compute Host Hypervisor images

Click here for filters or full text search. Filter Actions >

Displaying 2 items of 2

<input type="checkbox"/>	Hostname	Host title	Type	Image	State	Power state	Reserved	Instances	Actions
<input type="checkbox"/>	mnode1ana-deb10t-ovs-02stand loc		OEM U	defau lit	Up	-	No	2	Assign Power Control
<input type="checkbox"/>	mnode2ana-deb10t-ovs-02stand loc		OEM U	defau lit	Up	-	No	1	Assign Power Control

Displaying 2 items of 2

Overview **NUMA Topology** Instances list Action Log Scheduled Tasks Metrics SLA

Availability Storages

Devices

Model	Device type	NUMA node
No items to display.		

CPUs

CPU number	NUMA node	Memory size on the processor (KB)	List of available kernels
No items to display.			

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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:

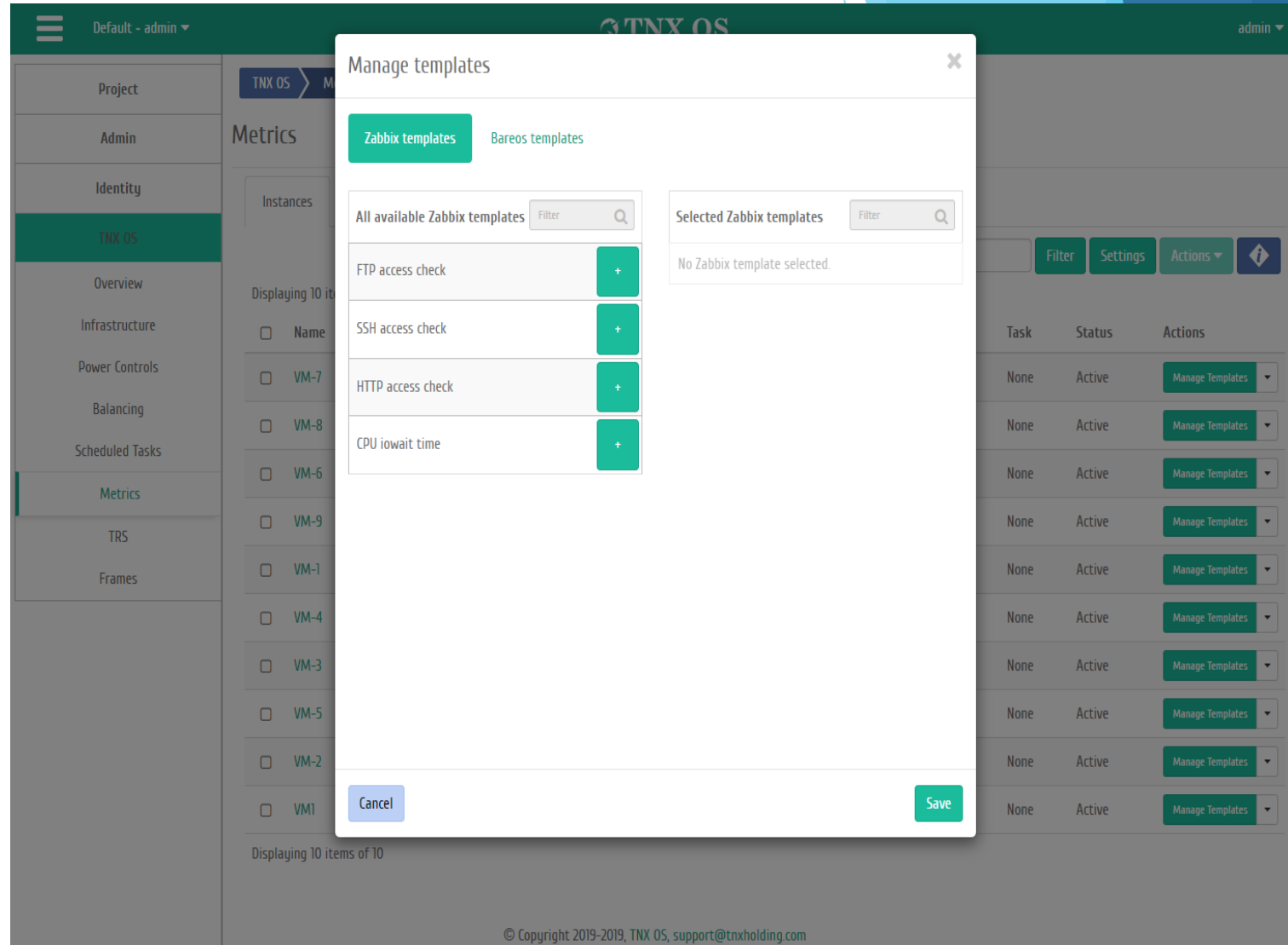
- Create volume snapshots to magnetic tape
- Restore snapshots from type to any date.

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

The screenshot displays the TNX OS management interface. On the left is a sidebar with navigation options: Project, API Access, Compute, Overview, Instances (selected), Images, Key Pairs, Bareos, Volumes, Network, Admin, Identity, and TNX OS. The main panel is titled 'Instances' and shows a table of 10 VM instances. Each instance has a checkbox, name, image name, IP address, size, status, task, power state, and an 'Associate Floating IP' button. Below the table, the details for instance 'VM1' are shown, including RAM (128MB), VCPUs (1 VCPU), Disk (0GB), Networks and network ports (Localnet: 192.168.2.20), Security Groups (default), Metadata (Key Name: stand, Image Name: cirros, Image ID: 0f96108c-2dad-4a7e-983f-de5a5a4205), and SLA (Up time: 99.999%, Recovery time: 8 h, Movable: Maybe). The 'current_memory' and 'current_cpu' fields are highlighted with a red box, showing values of 2000000 and 2 respectively.

Name	Image Name	IP Address	Size	Status	Task	Power State	Actions
VM-7	cirros	192.168.2.20	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-8	cirros	192.168.2.18	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-6	cirros	192.168.2.5	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-9	cirros	192.168.2.12	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-1	cirros	192.168.2.3	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-4	cirros	192.168.2.13	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-3	cirros	192.168.2.10	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-5	cirros	192.168.2.6	c1_r128_d0	Active	None	Running	Associate Floating IP
VM-2	cirros	192.168.2.7	c1_r128_d0	Active	None	Running	Associate Floating IP
VM1	cirros	192.168.2.19	c1_r128_d0	Active	None	Running	Associate Floating IP

Key Name	Value
RAM	128MB
VCPUs	1 VCPU
Disk	0GB
Networks and network ports	
Localnet	192.168.2.20
Security Groups	
default	<ul style="list-style-type: none">ALLOW IPv4 from defaultALLOW IPv4 icmp from 0.0.0.0/0ALLOW IPv4 udp to 0.0.0.0/0ALLOW IPv6 from defaultALLOW IPv4 to 0.0.0.0/0ALLOW IPv6 to :/0ALLOW IPv4 tcp to 0.0.0.0/0ALLOW IPv4 udp from 0.0.0.0/0ALLOW IPv4 tcp from 0.0.0.0/0
Metadata	
Key Name	stand
Image Name	cirros
Image ID	0f96108c-2dad-4a7e-983f-de5a5a4205
current_memory	2000000
current_cpu	2
SLA	
Up time	99.999%
Recovery time	8 h
Movable	Maybe

Multiple hypervisors support

The screenshot displays the TNX OS web interface for managing infrastructure. The left sidebar contains navigation links: Project, Admin, Identity, TNX OS (selected), Overview, Infrastructure (active), Power Controls, Balancing, Scheduled Tasks, Metrics, TRS, and Frames. The main content area is titled 'Infrastructure' and shows a list of hosts under the 'Hosts' tab. The interface includes search and filter controls, and a table of 5 hosts.

ID	Hostname	Host title	Class	Type	IP addresses	Active	Actions
<input type="checkbox"/> 1	mnode1.tst-deb9q-ovs-01.stand.loc	-	hypervisor	QEMU	10.40.144.11	Yes	<button>Disable DCC</button>
<input type="checkbox"/> 2	mnode2.tst-deb9q-ovs-01.stand.loc	-	hypervisor	QEMU	10.40.144.12	Yes	<button>Disable DCC</button>
<input type="checkbox"/> 3	xen-cn0	-	hypervisor	Xen	10.40.144.101	Yes	<button>Delete Host</button>
<input type="checkbox"/> 4	WIN-OG.FQQH9A9U	-	hypervisor	HyperV	10.40.144.102	Yes	<button>Delete Host</button>
<input type="checkbox"/> 5	domain-c24.7821a47c-db75-4468-ab17-052210cf4f01	-	hypervisor	VMware	10.40.144.103	Yes	<button>Delete Host</button>

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
-

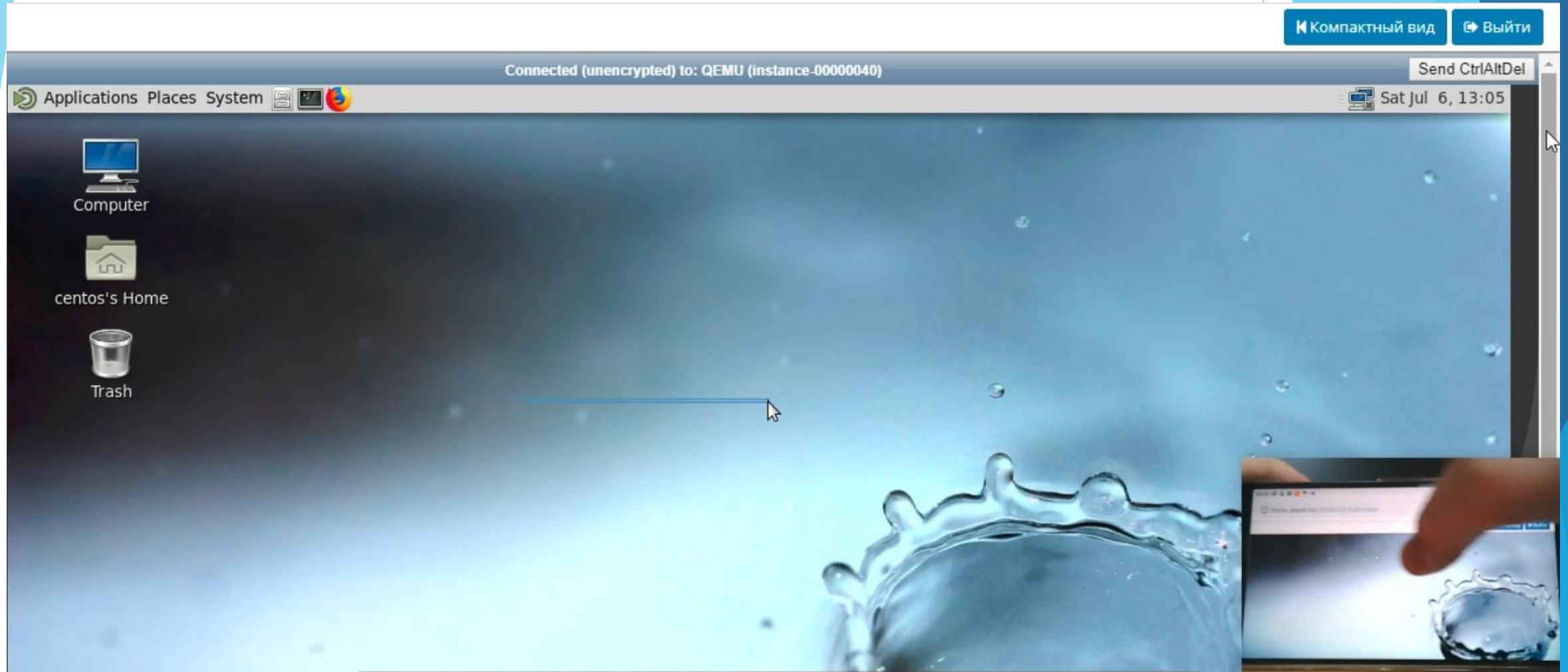
VDI AD support

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
-

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a plain, light grayish-white, providing a clean backdrop for the text.

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

Default - admin ▾ TNX OS admin ▾

Project > Compute > Instances

Instances

Instance Name ▾ Filter [Launch Base Instance \(Quota exceeded\)](#) [Launch Instance \(Quota exceeded\)](#) Actions ▾

Displaying 10 items of 10

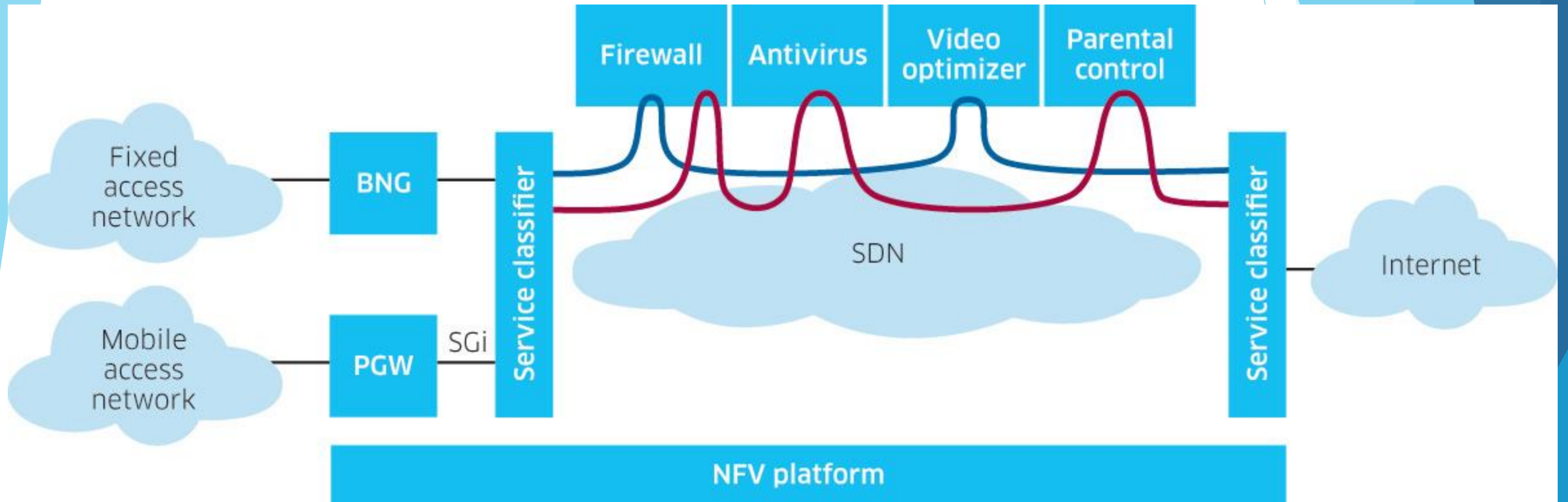
<input type="checkbox"/>	Name ▲	Image Name	IP Address	Size	Status	Task	Power State	Actions
<input type="checkbox"/>	VM1	cirros	192.168.2.19	cl_r128_d0	Active	None	Running	Associate Floating IP
<input type="checkbox"/>	VM-1	cirros	192.168.2.3	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-2	cirros	192.168.2.7	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-3	cirros	192.168.2.10	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-4	cirros	192.168.2.13	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-5	cirros	192.168.2.6	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-6	cirros	192.168.2.5	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-7	cirros	192.168.2.20	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-8	cirros	192.168.2.18	cl_r128_d0	Active	None	Running	
<input type="checkbox"/>	VM-9	cirros	192.168.2.12	cl_r128_d0	Active	None	Running	

Displaying 10 items of 10

- Attach Interface
- Clone Instance (Quota exceeded)
- Console
- Create Snapshot
- Delete Instance
- Detach Interface
- Edit Instance
- Edit Security Groups
- Hard Reboot Instance
- Lock Instance
- Manage Volume Attachments
- Pause Instance
- Rebuild Instance
- Resize Instance
- Schedule
- Shelve Instance
- Show metrics
- Shut Off Instance
- Soft Reboot Instance
- Suspend Instance

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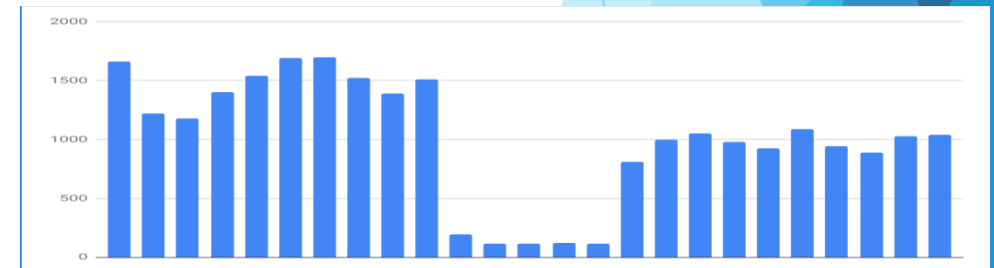
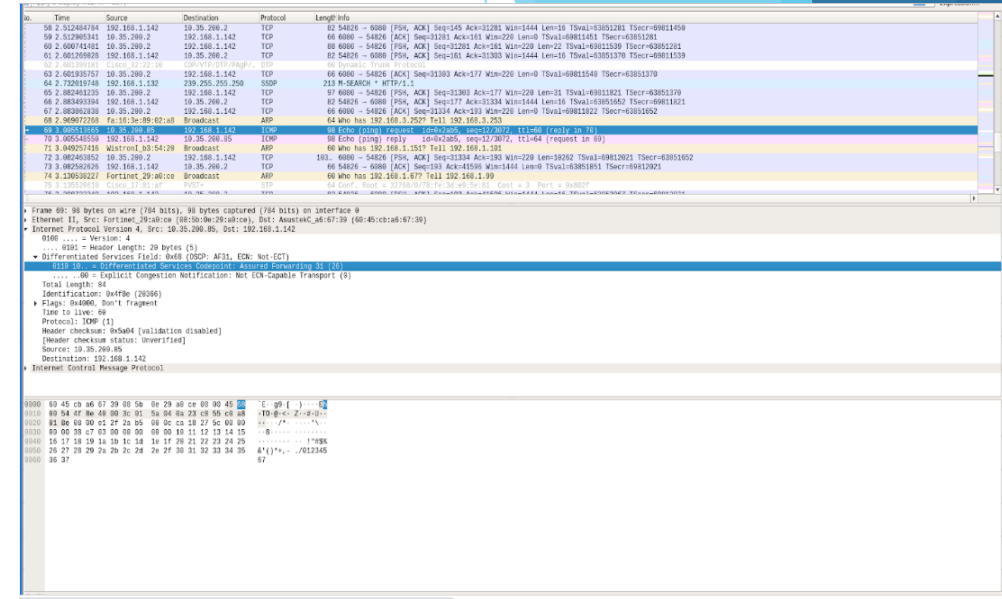
SFC (service function chaining) support



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



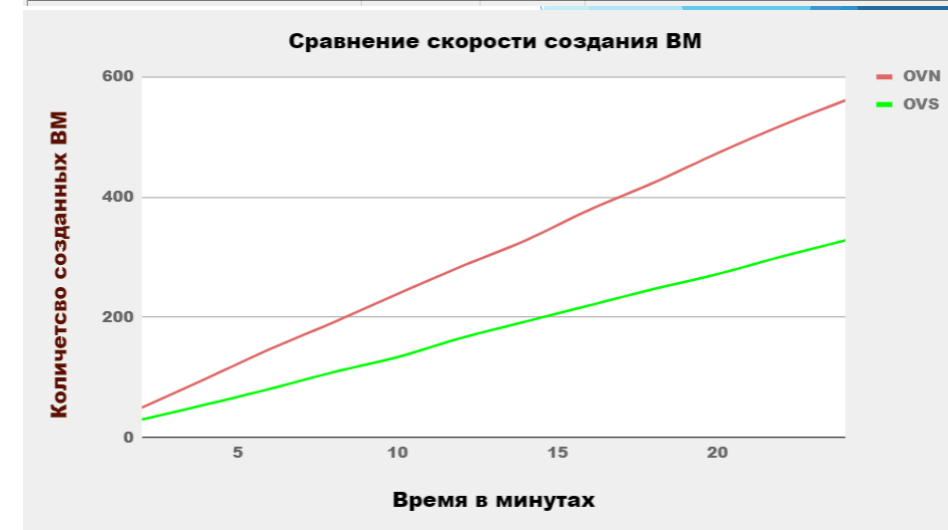
Network control with OVN/GENEVE

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!