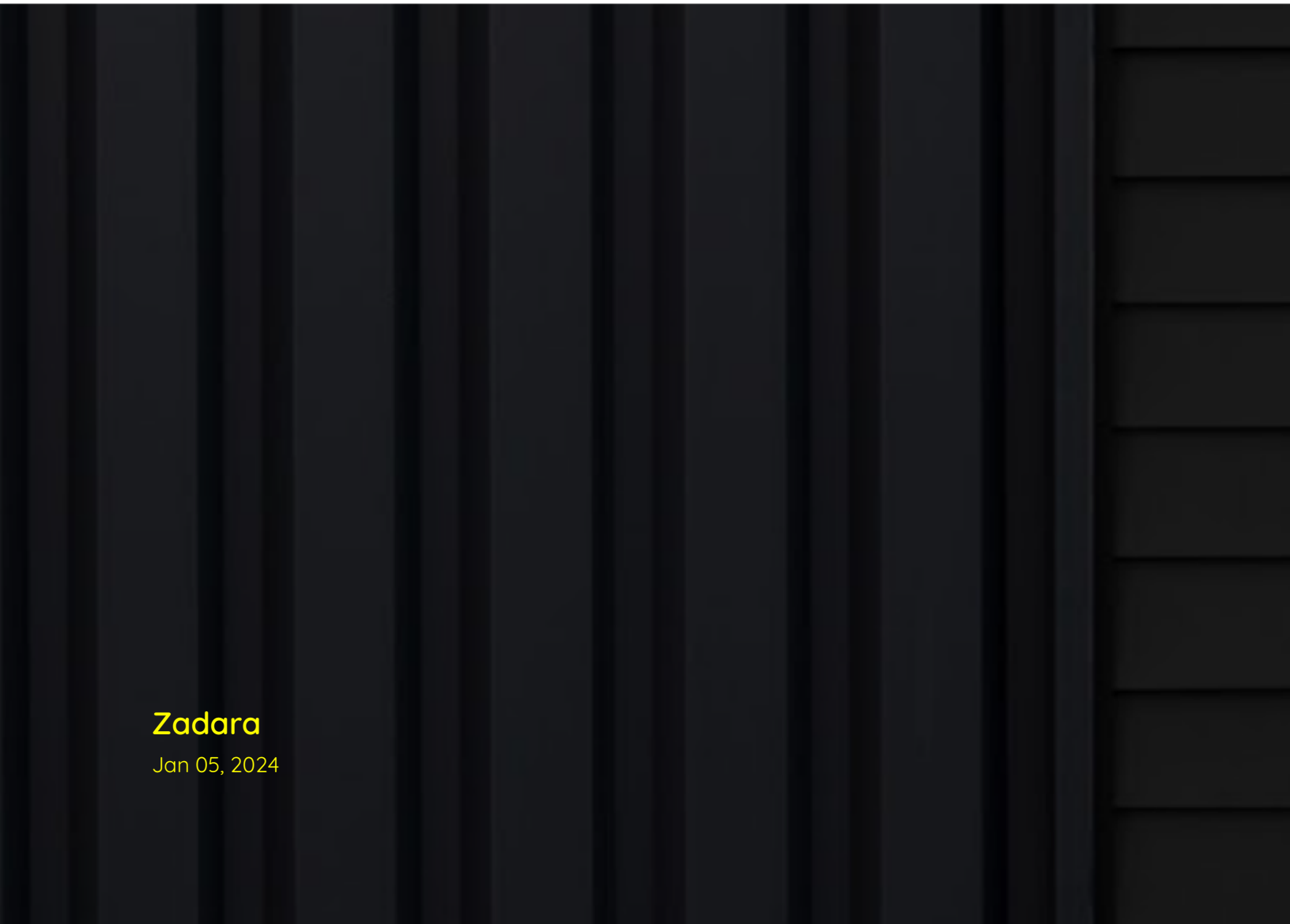
zadara

Command Center Administrator Guide

Release 23.09



Zadara

Jan 05, 2024

CONTENTS

1 Introduction 1

2 Architecture 3

3 Understanding Command Center Main Dashboard 5

4 Managing Storage Nodes 9

5 Managing VPSAs 25

6 Managing Object Storage VPSAs 47

7 Managing Physical Drives 57

8 Viewing Engine Properties 63

9 Managing Cloud Networking 67

10 Creating Public IP Addresses 75

11 Managing Data Services 77

12 Performing Image Management 83

13 Customizing VPSA And Object Storage User Interface 87

14 Managing Command Center Users And Roles 89

15 Managing Cloud Settings 99

16 Managing Cloud Logs 117

17 Using Comments In Command Center 121

CHAPTER

ONE

INTRODUCTION

1.1 Intended Audience

This document is intended for Storage Administrators of the Zadara Storage Cloud who are responsible for managing the cloud and providing Enterprise Storage-as-a-Service via the Zadara Storage VPSA service.

1.2 Zadara Storage Command Center

1.2.1 Overview

Zadara Storage Cloud was architectured from the ground up to build the first "Enterprise-Storage-as-a-Service Data Storage System for the Cloud" with the following key targets:

- Enterprise quality, resilient, highly available, consistent performance storage for the most demanding data center application workloads
- Consumed as a Service - flexible, dynamic and billable
- Scale out - grow to hundreds of Storage Nodes, thousands of drives and multi-Petabyte Storage
- True Multi-tenancy - End-user controlled privacy and security. Separate workloads, resource allocation, and management per tenant, such that each tenant truly experiences "no noisy neighbors" secure storage.
- Universal Storage - Supports all data services on one common infrastructure: Block, File, Object

Zadara Command Center is a centralized point of management and monitoring for the Zadara Storage Cloud. Command Center enables Administrators to:

- Extract detailed information regarding cloud elements such as : VPSA instances , storage Nodes , disk drives and software images
- Define global cloud level polices that impact all underlying tenants
- Monitor Cloud resources utilization and health from a single pane of glass
- Maintain cloud infrastructure and control software images available for tenants
- Perform management and maintenance operations on Virtual private storage array instances defined on the cloud
- Manage cloud expansions (adding storage nodesdisk drives)
- Perform cloud user management
- Perform cloud level license key management
- View a detailed Central-Log of all cloud elements

1.2.2 Terminology

Item	Description
SN	Storage Node. Commodity server with large number of CPU cores (typically 16 or more) and large RAM (typically 64GB or more), connected to 10Gb/40Gb data network with Intel/Mellanox SRIOV NICs & 1Gb management network
VPSA	Virtual Private Storage Array. A redundant and Highly available Software Defined Storage (SDS) that has all resources (CPU, memory, network, disks) provisioned entirely for itself thereby providing consistent QoS storage
VPSA Object Storage	Zadara Intelligent Object Store. Redundant, Durable, Highly Available virtual object store cluster that has resources (CPU, memory, network, disks) provisioned
VC	Virtual Controller. A Virtual Machine running Zadara Storage IO stack. Two VC's are paired together in High-Availability configuration to form a VPSA.
Provisioning Portal (eCommerce)	The web application portal for the end-users to create VPSA's/VPSA Object Storage and provisioning their resources (Drives, IO Engines, Flash Cache etc). Pricing and Billing are also managed via the Provisioning Portal
Cloud Controller (CC)	Set of software components that manages the storage cloud (like allocating resources for VPSA/VPSA Object Storage with intelligent scheduler, monitoring, and provisioning networking/storage for VPSA/VPSA Object Storage etc.)
Command Center	Web Application for the Cloud Administrator to monitor and maintain the Zadara Cloud (inventory management, maintenance operations etc)
CCVM	A system Virtual Machine within the Zadara Cloud which runs the Command Center and the provisioning portal
FE Network/Data Network	Front-End network. 10Gb/40Gb network through which Application Servers can connect to Zadara VPSA Storage for IO and Control
BE Network	Back-End network. 10Gb/40Gb network through which SNs and VPSA interconnect for data IOs
Management Network	Internal 1Gb network for management operations of VPSA, VPSA Object Storage & SN
SRIOV	Single Root IO Virtualization. A networking standard by which a physical adapter is logically provisioned for different VMs, bypassing the Hypervisor
Application Server	A server or a Virtual Machine in the Compute Cloud which consumes VPSA iSCSI Block Volume or NAS shares
Tenant	Each end-user that accesses Zadara Storage Cloud. NOTE: Each end-user could have multiple users/logins, but they all could belong to same tenant
QoS	Quality of Service - Defines Performance/Reliability characteristics of a service

CHAPTER

TWO

ARCHITECTURE

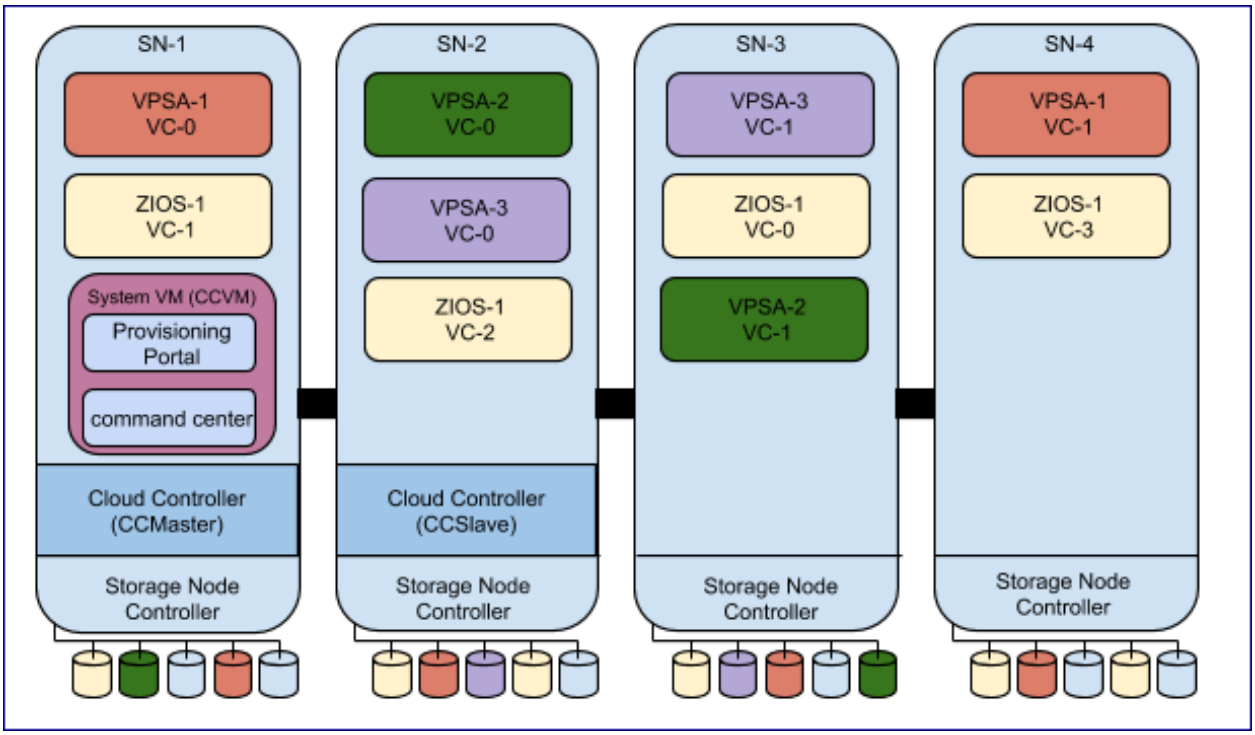
2.1 Cloud Management Software Deployment

The Zadara cloud contains two storage nodes which are assigned to the roles of Cloud controller master(or ccmaster) and Cloud controller slave(or ccslave). CCmaster/CCslave Storage nodes are responsible for Cloud management and monitoring in addition to virtual storage controller hosting like any other Cloud storage node. The ccmaster storage node actively hosts all cloud management function including a dedicated cloud controller virtual machine(or ccvm). In case of any failure in the cloud controller master node a fail over of all cloud management resources to the Cloud controller slave is performed.

Zadara cloud can be centrally managed by 2 software components:

- Provisioning portal
- Command center

By default both Provisioning portal and Command center reside within the cloud controller virtual machine .



Provisioning portal can also be deployed on any cloud application platform such as Heroku. This topology should be deployed when there is a need to manage multiple clouds in multiple regions in a single portal.

✔ **Note:**

- The cloud controller virtual machine supports both IPv4 and IPv6 for its frontend address.

Important: Zadara's web applications allow only TLS 1.2 and higher, which is the recommended TLS level by industry standards. The TLS (Transport Layer Security) protocol secures transmission of data over the internet using standard encryption technology.

CHAPTER

THREE

UNDERSTANDING COMMAND CENTER MAIN DASHBOARD

3.1 Accessing Command Center

To Access command center open you web browser and navigate to the following URL: http://your-ccvm-hostname:8888

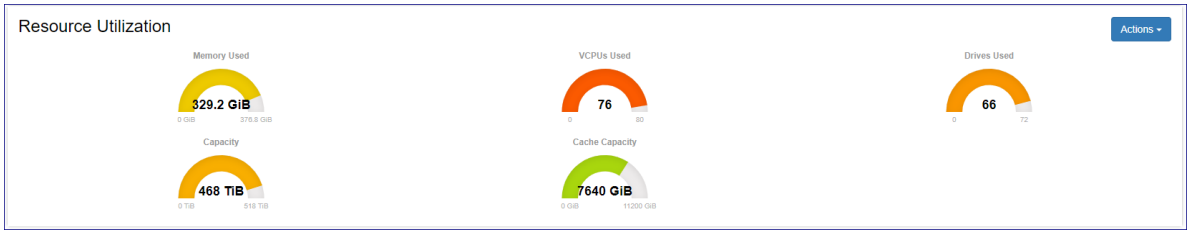
In case of first login the cloud administrator user credentials will be provided by Zadara operation after cloud installation. Additional user-ids can be created by the cloud administrator and will receive temporary credentials for initial login via their provided e-mail address.

3.2 Command Center Dashboard Overview

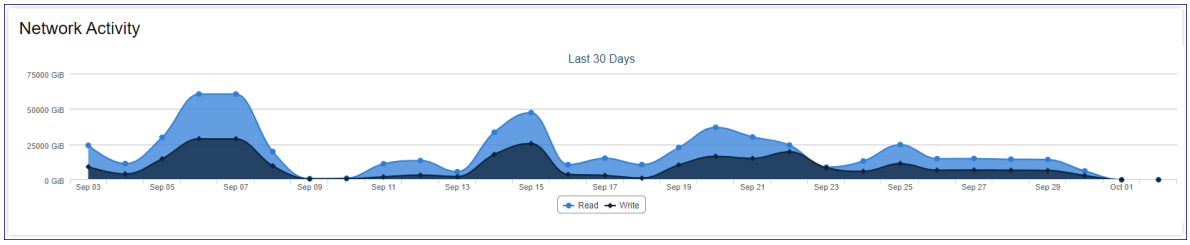
Command centers main dashboard was designed to provide Zadara cloud administrators with a centralized viewpoint on their cloud utilization and to perform cloud level operations.

The dashboard is built out of 4 main panels - each monitoring a different key aspect of the cloud infrastructure:

- The resource utilization panel provides a birds eye view on the core cloud resources utilization such as : vcpus, memory, disks etc.

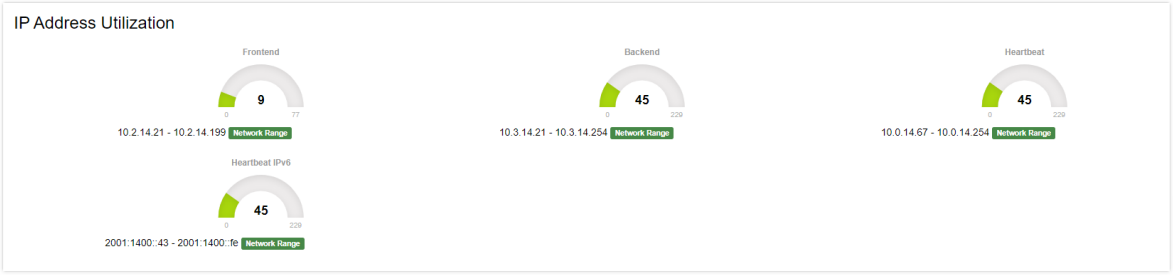


- The Network Activity panel provides monitoring data for real time network throughput and utilization.



- The Drive Utilization panel provides a breakdown of drives by their model and utilization per each.

- The IP address Utilization panel displays the defined IP ranges for frontend, Backend and heartbeat networks and the level of allocation per each.



Note: These networks are predefined with fixed ranges of IP addresses and cannot be overlapped with VPSA virtual networks.

3.3 Performing Cloud Level Operations

Creating a CCVM Zsnap

To create a zSnap of the cloud controller virtual machine navigate to command centers dashboard, click on the `Actions` button and select create CCVM zSnap from the drop down menu. On the popup dialog that will appear provide a prefix for the zSnap and click on the `Create zSnap` button to confirm creation.

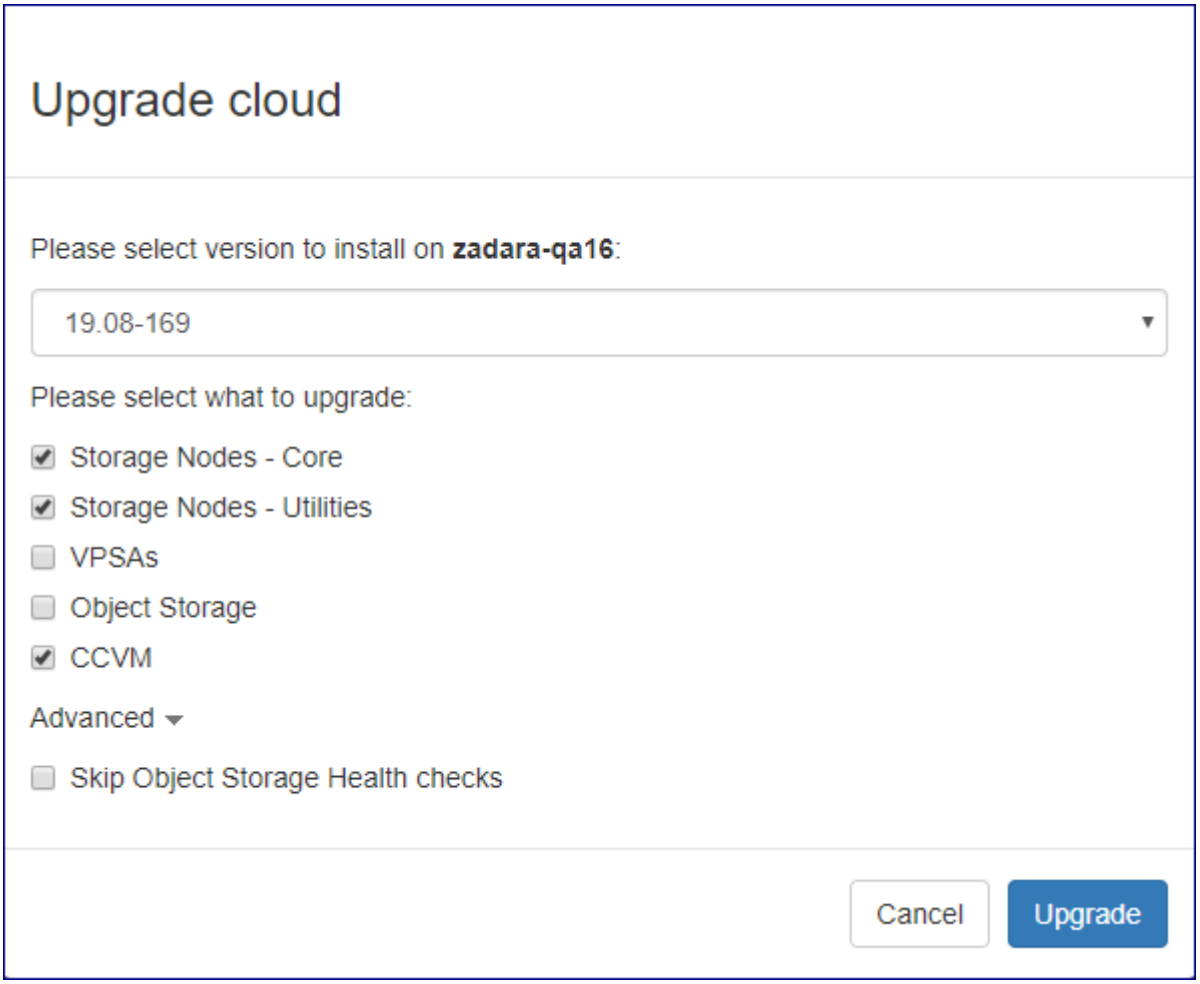
Performing cloud version upgrades

Command center allows cloud administrators to orchestrate a complete cloud upgrade workflow including :

- Storage Nodes software
- Storage Node utilities
- VPSA instances running on the cloud
- VPSA Object Storage instances running on the cloud
- Cloud controller virtual machine(CCVM)

All elements listed above or any subset of them can be upgraded in a single workflow.

To perform cloud version upgrade navigate to command centers dashboard, click on the `Actions` button and select Upgrade from the drop down menu. On the cloud upgrade dialog that will appear check the elements you would like to upgrade. When upgrading VPSA object storage you can configure that the upgrade process will not perform Object storage health checks by clicking on Advanced and checking Skip Object Storage Health checks.

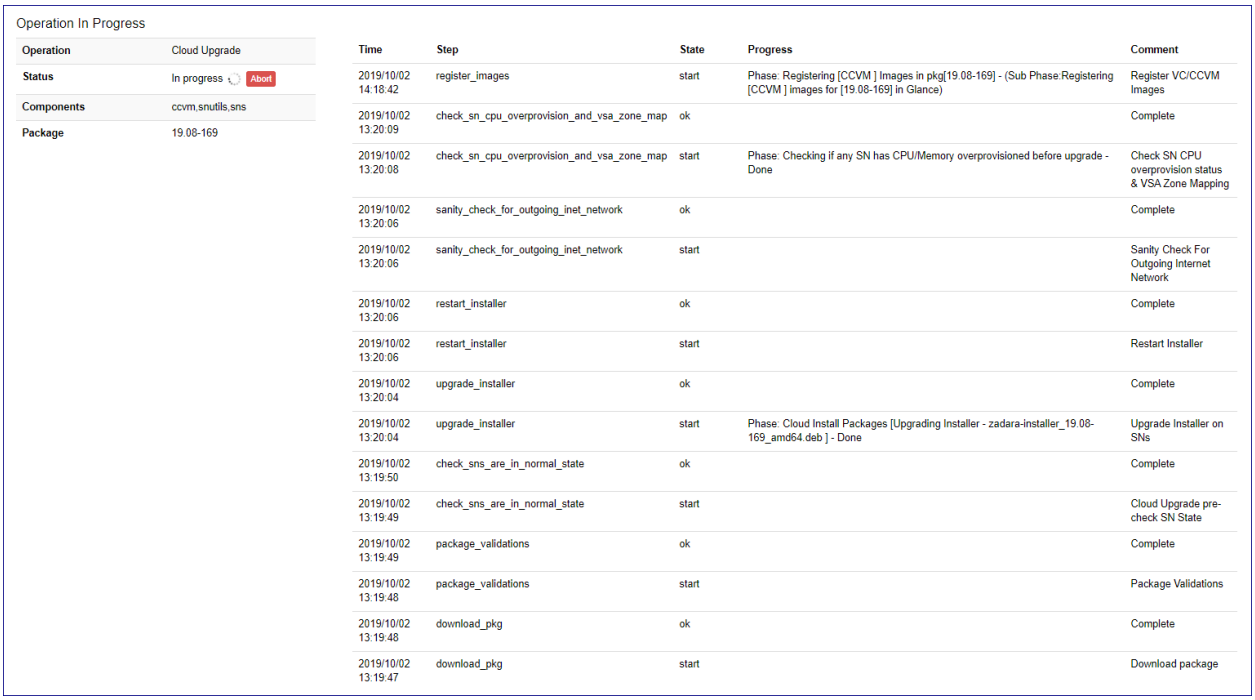


Note:

The recommended procedure for cloud upgrade is to perform SN (software + Utilities) and CCVM upgrade in a single workflow and
perform VPSA/VPSA Object storage instances upgrade after successful completion of the first workflow.

To confirm the upgrade process click on the `Upgrade` button.

During cloud upgrade processing the Command Center Dashboard will present the upgrade workflow and status per all stages.



Operation In Progress

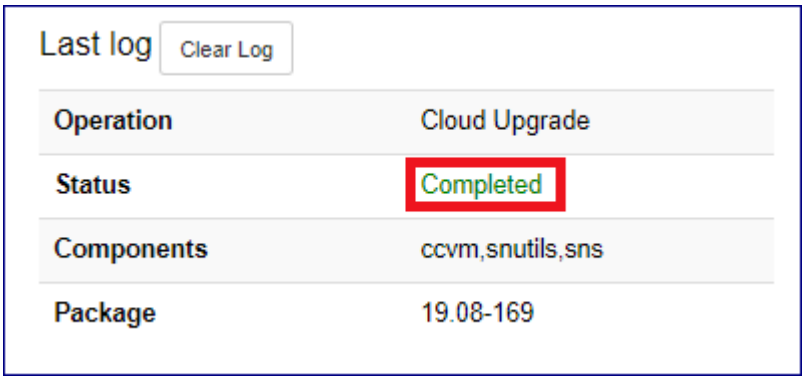
Operation	Cloud Upgrade
Status	In progress Abort
Components	ccvm,snutils,sns
Package	19.08-169

Time	Step	State	Progress	Comment
2019/10/02 14:18:42	register_images	start	Phase: Registering [CCVM] Images in pkg[19.08-169] - (Sub Phase:Registering [CCVM] images for [19.08-169] in Glance)	Register VC/CCVM Images
2019/10/02 13:20:09	check_sn_cpu_overprovision_and_vsa_zone_map	ok		Complete
2019/10/02 13:20:08	check_sn_cpu_overprovision_and_vsa_zone_map	start	Phase: Checking if any SN has CPU/Memory overprovisioned before upgrade - Done	Check SN CPU overprovision status & VSA Zone Mapping
2019/10/02 13:20:06	sanity_check_for_outgoing_inet_network	ok		Complete
2019/10/02 13:20:06	sanity_check_for_outgoing_inet_network	start		Sanity Check For Outgoing Internet Network
2019/10/02 13:20:06	restart_installer	ok		Complete
2019/10/02 13:20:06	restart_installer	start		Restart Installer
2019/10/02 13:20:04	upgrade_installer	ok		Complete
2019/10/02 13:20:04	upgrade_installer	start	Phase: Cloud Install Packages [Upgrading Installer - zadara-installer_19.08-169_amd64.deb] - Done	Upgrade Installer on SNs
2019/10/02 13:19:50	check_sns_are_in_normal_state	ok		Complete
2019/10/02 13:19:49	check_sns_are_in_normal_state	start		Cloud Upgrade pre-check SN State
2019/10/02 13:19:49	package_validations	ok		Complete
2019/10/02 13:19:48	package_validations	start		Package Validations
2019/10/02 13:19:48	download_pkg	ok		Complete
2019/10/02 13:19:47	download_pkg	start		Download package

Note:

During SN software upgrade ccmaster failover will be performed. At this period CCVM will reboot and Command center will not be available until reboot is finished - same for CCVM version upgrade.

When upgrade workflow is finished completion will be indicated on the command center dashboard.



Last log Clear Log

Operation	Cloud Upgrade
Status	Completed
Components	ccvm,snutils,sns
Package	19.08-169

CHAPTER

FOUR

MANAGING STORAGE NODES

One of Command centers key roles is to enable Could infrastructure management in which storage nodes are a core component. Command center provides comprehensive management and monitoring capabilities for the clouds storage nodes including all aspects of:

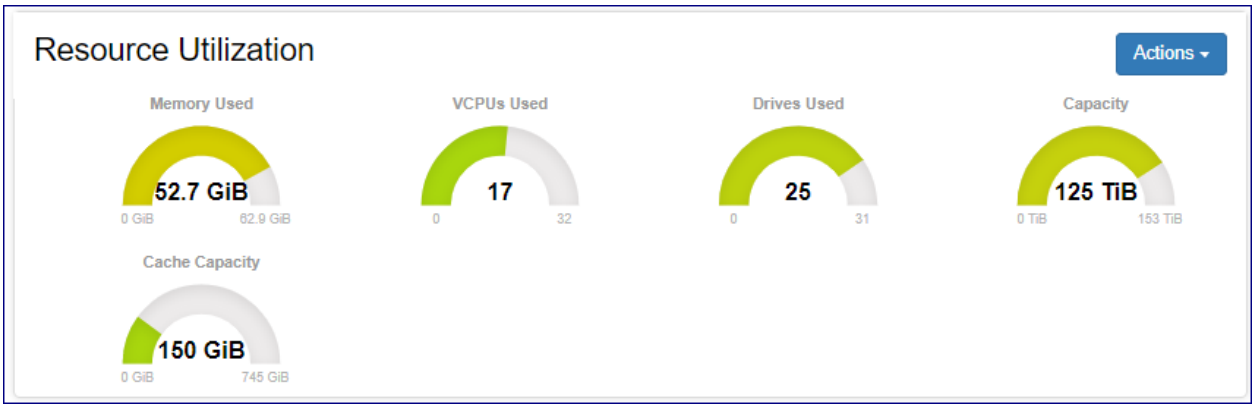
- Ongoing maintenance
- Upgrade managing
- Hardware addition and retirement
- Health checks
- Performance monitoring

4.1 Understanding The Storage Node Dashboard

The storage node dashboard presents information regarding its configuration, status and resource utilization. The dashboard can be reached by clicking on Storage Nodes from Command center left menu panel and then selecting a specific storage node from the cloud inventory and clicking on it. The storage node dashboard contains multiple panels each providing information on a specific aspect of the SN configuration and status:

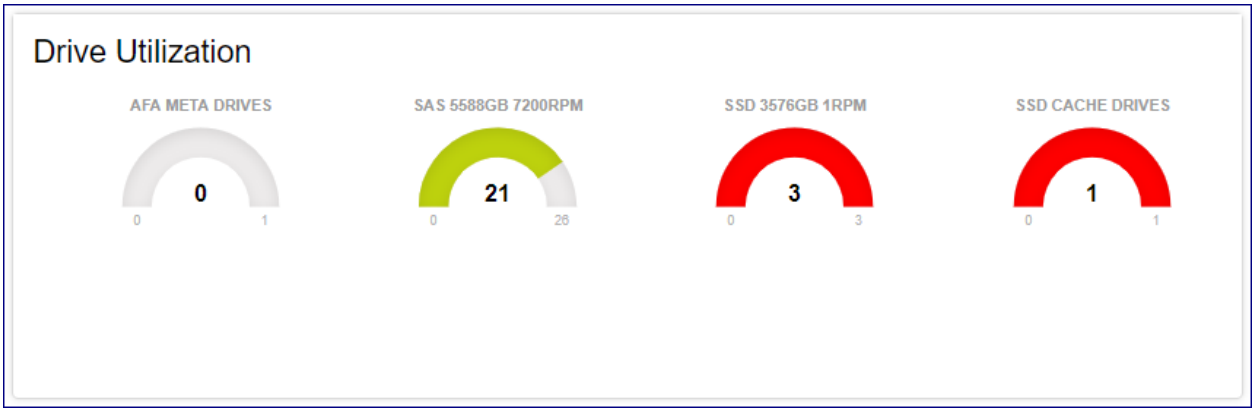
Resource Utilization

Provides a current image on SN hardware resources and their level of utilization.



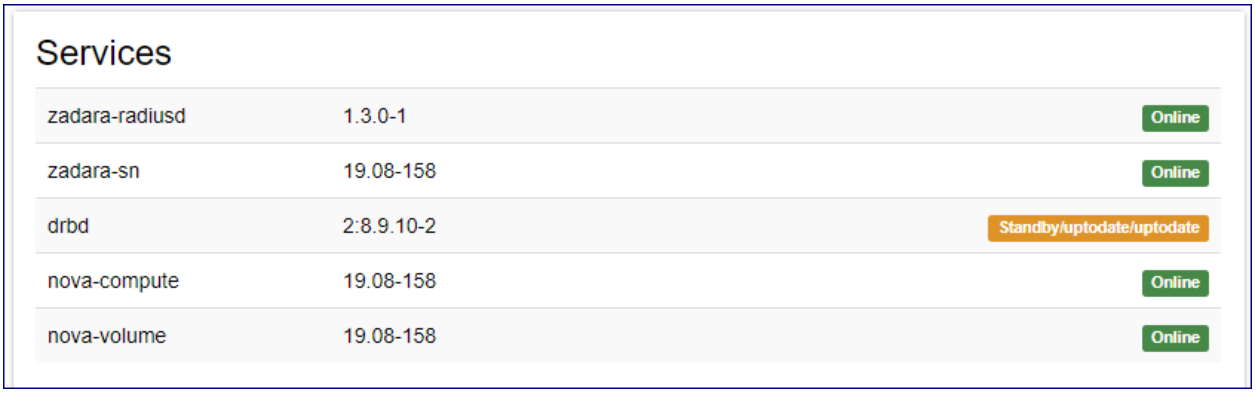
Drive Utilization

Provides a breakdown of the SN drive inventory by type and role and displays the level of utilization per each specific group.

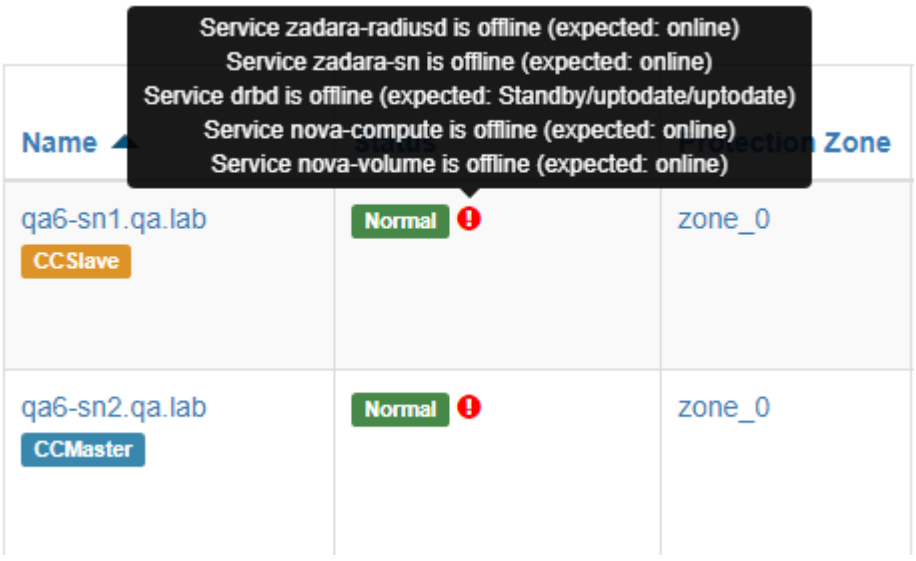


services

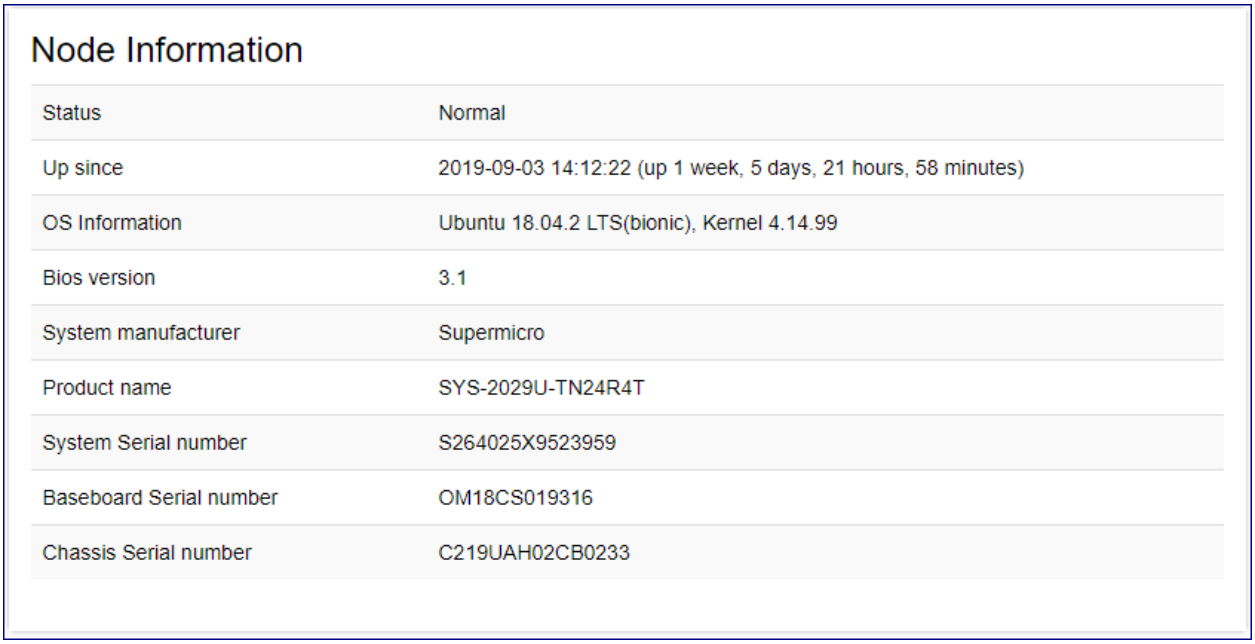
Displays the list of services running on the SN and their current status.



In case that some services on the storage note are not in normal status those specific services will also be indicated by a tooltip on the cloud storage nods grid.



Node Information Displays SN hardware, configuration and status information such as: SW version, uptime and serial number.

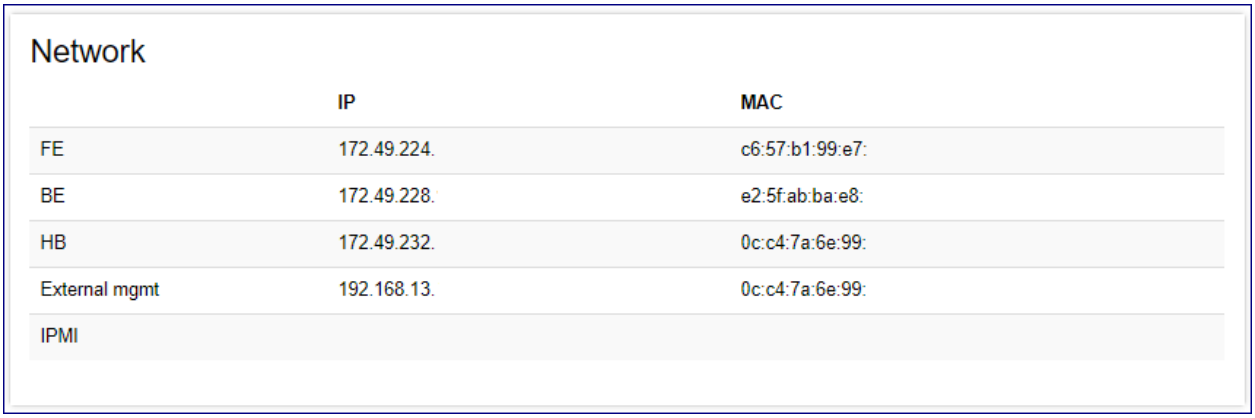


Node Information

Status	Normal
Up since	2019-09-03 14:12:22 (up 1 week, 5 days, 21 hours, 58 minutes)
OS Information	Ubuntu 18.04.2 LTS(bionic), Kernel 4.14.99
Bios version	3.1
System manufacturer	Supermicro
Product name	SYS-2029U-TN24R4T
System Serial number	S264025X9523959
Baseboard Serial number	OM18CS019316
Chassis Serial number	C219UAH02CB0233

Network

Displays SN networks and configured IP addresses.



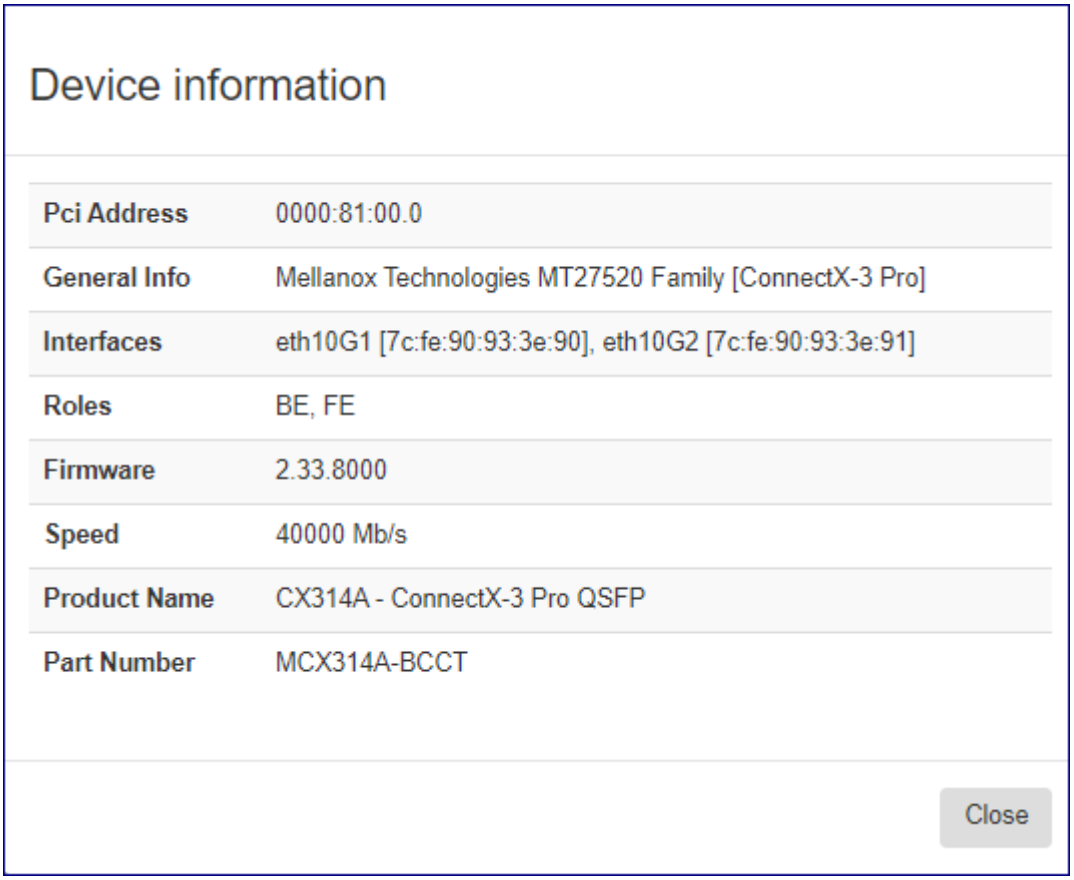
Network

	IP	MAC
FE	172.49.224.	c6:57:b1:99:e7:
BE	172.49.228.	e2:5f:ab:ba:e8:
HB	172.49.232.	0c:c4:7a:6e:99:
External mgmt	192.168.13.	0c:c4:7a:6e:99:
IPMI		

Resource Scheduling

Display information regarding the availability of the Sn resources(VCPUs and disk drives) To be allocated for newly provisioned VPSA/VPSA Object Storage entities by the clouds orchestration framework.

NIC Information Displays hardware and configuration information on the SN data path network card.

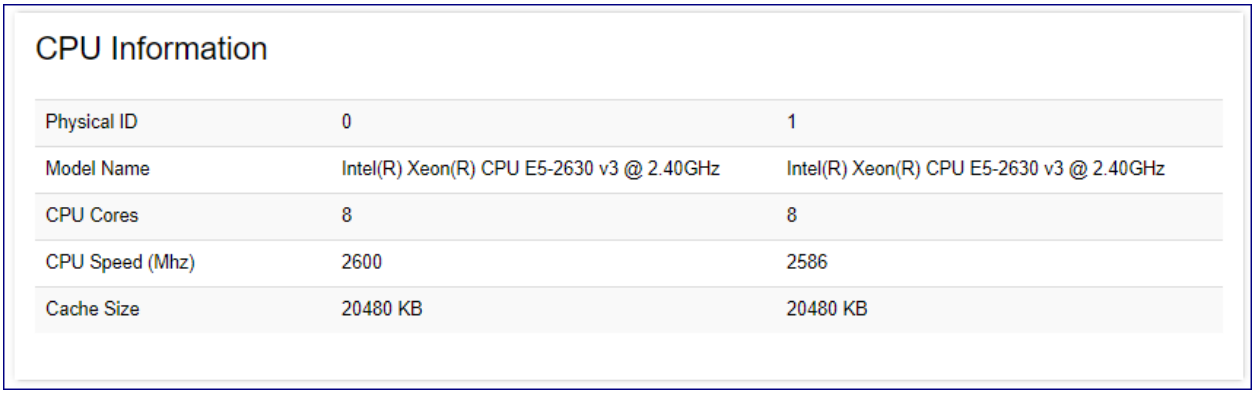


Note:

Mellanox ConnectX-5 dual port NICs will be presented as 2 sperate network adapters due to having 2 different PCI addresses.

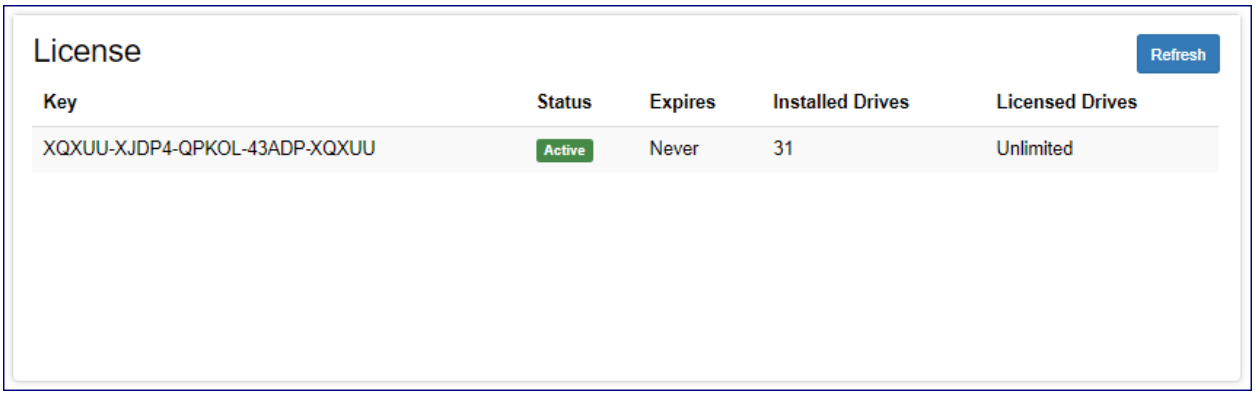
CPU information

Displays information on the SNs processors.



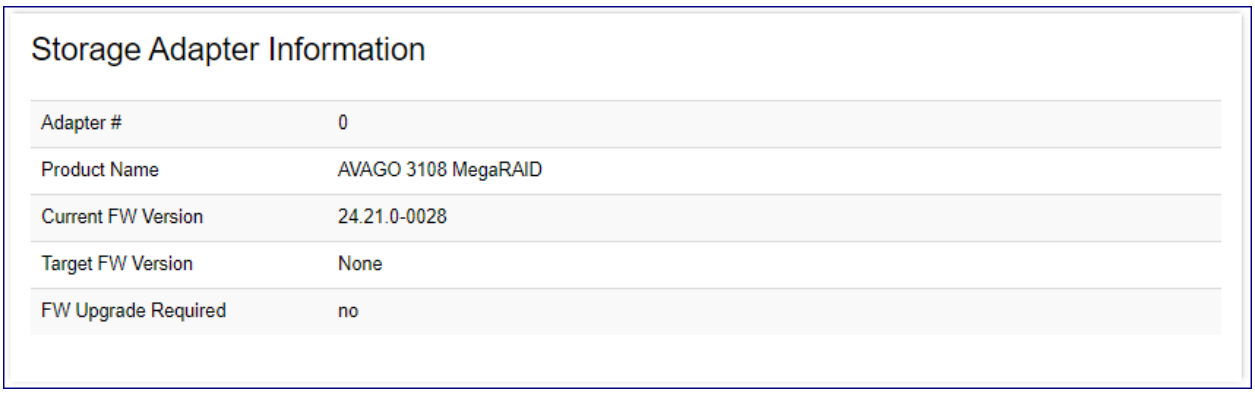
License information

Displays SN licensing information.



Storage Adapter

Displays information on the SN internal RAID adapter.

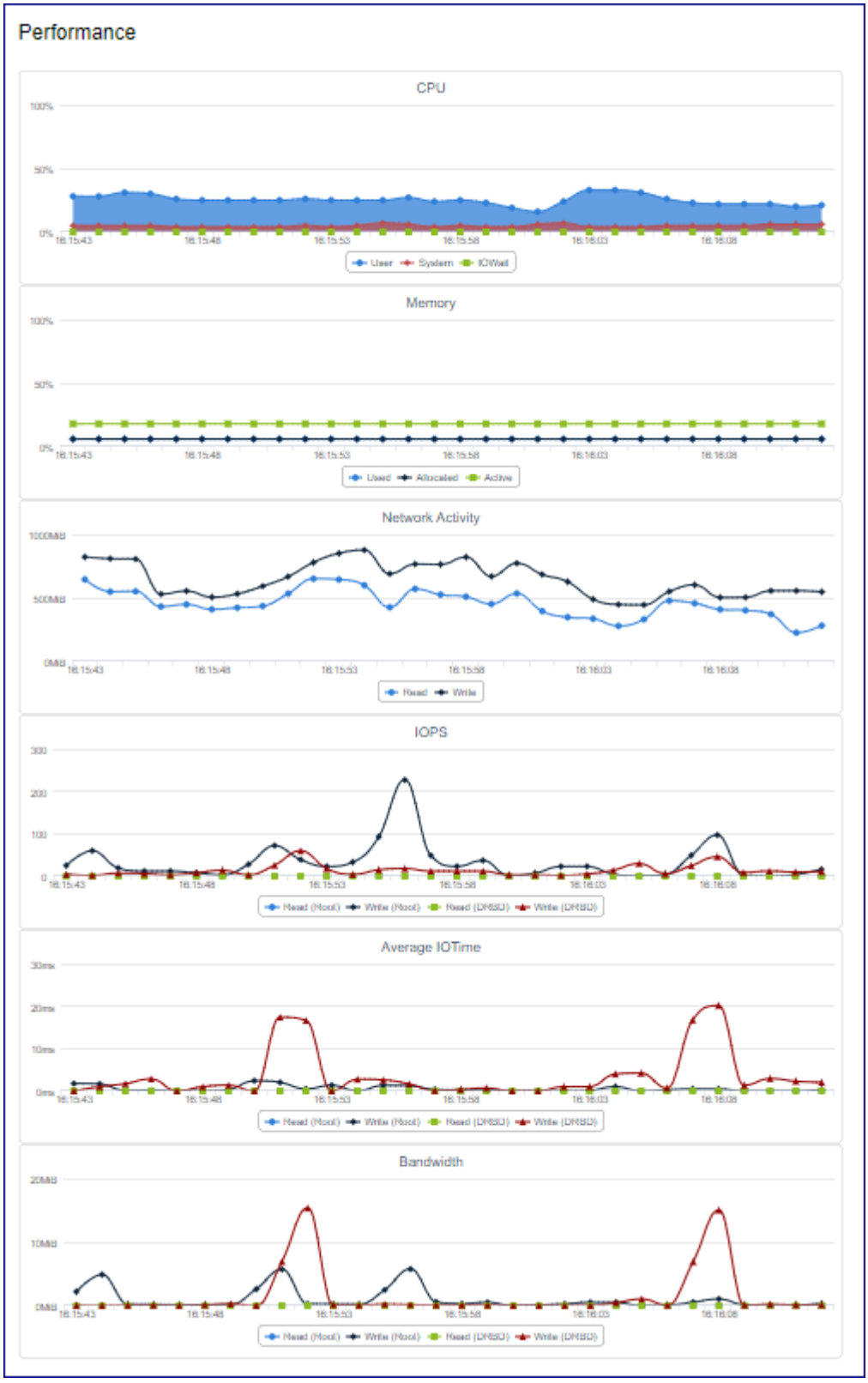


4.2 Monitoring Storage Node Performance

Command center provides a real time monitoring framework for storage node performance. Monitoring is available from the Performance in tab in the specific VPSA.

Performance statistics displayed per storage nodes include :

- Storage node CPU utilization
- Storage node memory consumption
- Network bandwidth distribution (read/write)
- Average IO service time per IO type
- IO throughput distribution



Monitoring interval can be changed supported intervals are : 1sec ,10sec, 1min, 1hr and 1day. Interactively refreshed charts can be triggered by pushing the `Auto refresh` button.

4.3 Performing Storage Node Operations

Changing storage node resource scheduling configuration

A storage node contains compute and storage resources(CPU,RAM and disks) that are allocated for virtual controllers of VPSA and VPSa object storage entities. Allocation of SN resources for the creation of virtual controllers or allocation of disks from SN to virtual controllers can be enabled or disabled using Command center.

To modify a storage node resource allocation policy go to the resources scheduling panel in the SN dashboard.

- Click on `Enable` or `Disable` for Drive Scheduling to enable/disable allocation of disks from this SN to virtual controllers.
- Click on `Enable` or `Disable` for VC Scheduling to enable/disable creation of virtual controller on this SN.

Any changes made in the SN scheduling policy are immediately applied.

Creating storage node Zsnap

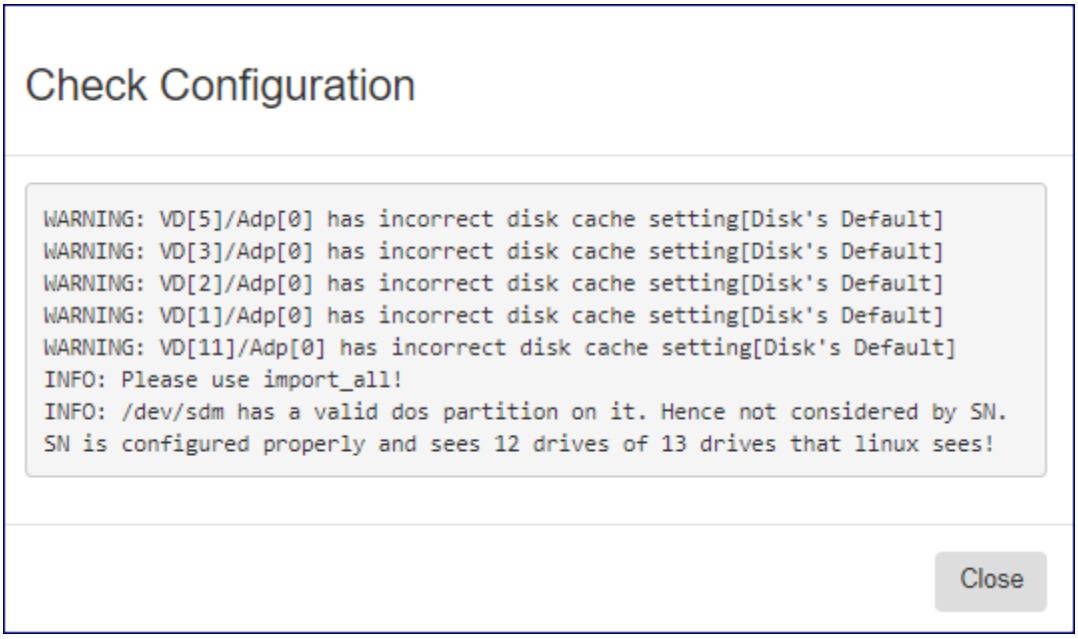
To Trigger Manual creation of Zsnap for a storage node go to its dashboard, click the `Actions` button and select Create Zsnap from the drop down menu. On the popup dialog that will appear provide the prefix for the Zsnap and confirm creation by clicking on the `Create Zsnap` button.

Install and import new drives in a storage node

Cloud storage capacity expansion is performed by installing drives into the storage node importing the newly installed drives into the SN. The import operation encapsulates hardware discovery and SN\cloud inventory update. To preform import of newly installed physical drives select the SN to which drives where installed, click on the `Actions` button and select Import Drives. On the popup dialog that will appear confirm the import operation by clicking on the `Confirm` button. A resource scan will be performed and any newly installed disks will be imported. The output from the import operation will be presented in a new popup window.

Perform Storage Node drive configuration check

Command Center can trigger a Storage node drive configuration check in which the SN drive configuration is validated against the OS drive configuration. To perform a drive configuration check select the SN to which drives where installed click on the `Actions` button and select Check Configuration. On the popup dialog that will appear confirm the import operation by clicking on the `Confirm` button. The configuration check will be immediately performed and its output displayed on a new popup dialog.



Performing storage node version upgrade

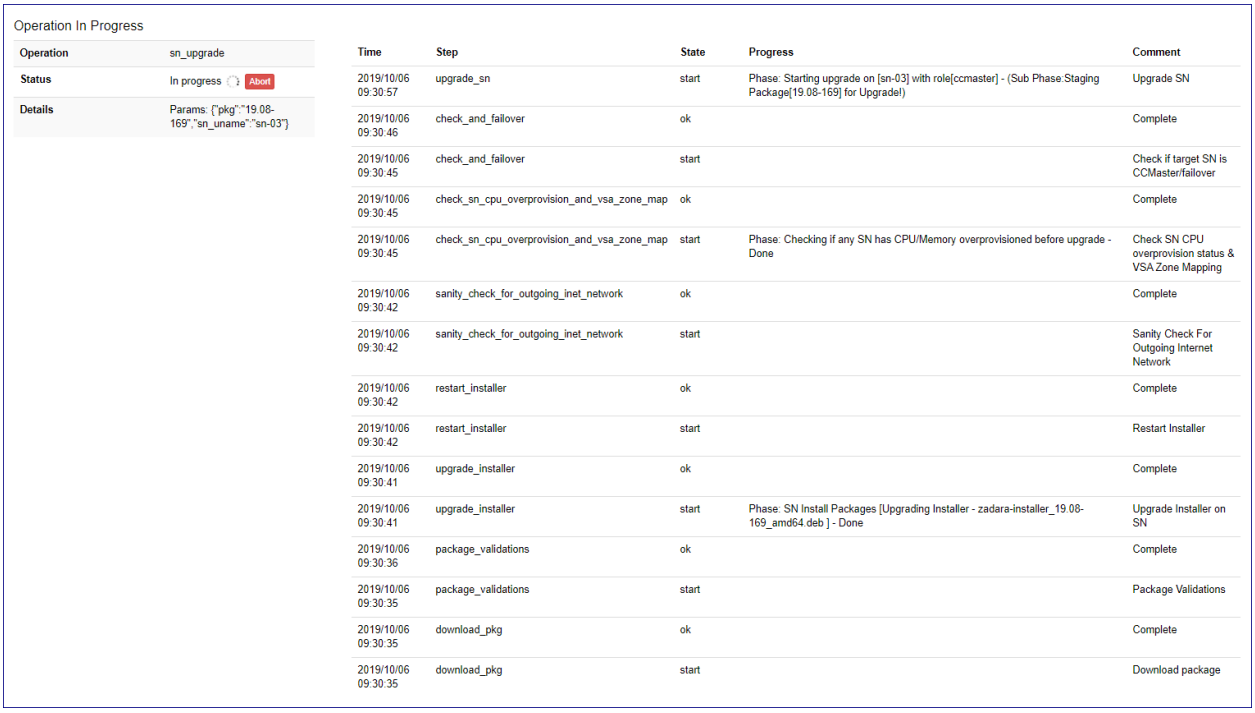
Storage node Version upgrade can be performed as part of a complete cloud upgrade workflow from Command centers main dashboard or from the Storage Node dashboard. Upgrade done from the SN dashboard is useful when the cloud upgrade process is performed gradually as a multiple milestone process.

To upgrade A storage node from the SN dashboard navigate to the appropriate SN, click on the `Actions` button and select Upgrade Version. On the popup dialog that will appear select the software version you would like to upgrade your SN to and click on `Upgrade` to confirm the process.

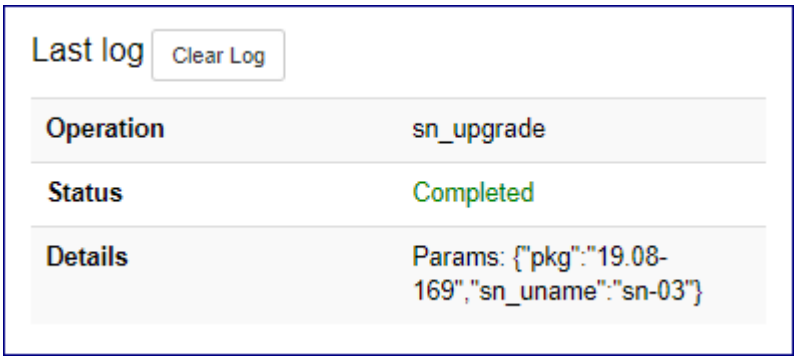
✔ **Note:**

Versions marked by asterisk are available but not downloaded to the cloud. Upgrade to those version requires package download and registration beforehand.

During the SN upgrade process status will be displayed on Command center main dashboard, The upgraded Storage node services panel will present all services as offline.



When the Storage node upgrade is finished completion will be indicated on the Command center dashboard.

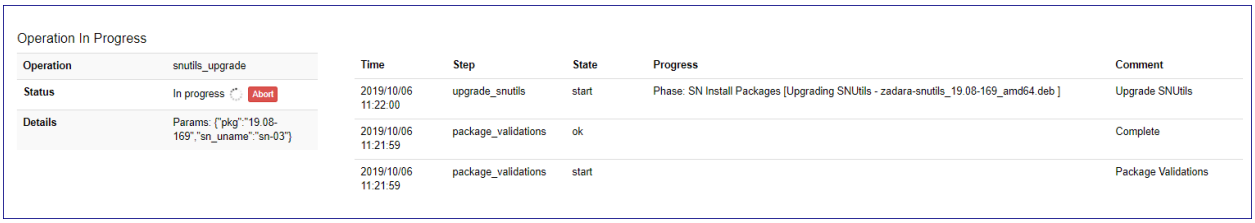


Performing storage node utilities version upgrade Storage Node utilities can be upgraded in a dedicated process via Command centers SN dashboard. To upgrade Storage node utilities navigate to the appropriate SN, click on the `Actions` button and select Upgrade Utilities. On the popup dialog that will appear select the utilities version you would like to upgrade your SN to and click on `Upgrade` to confirm the process.

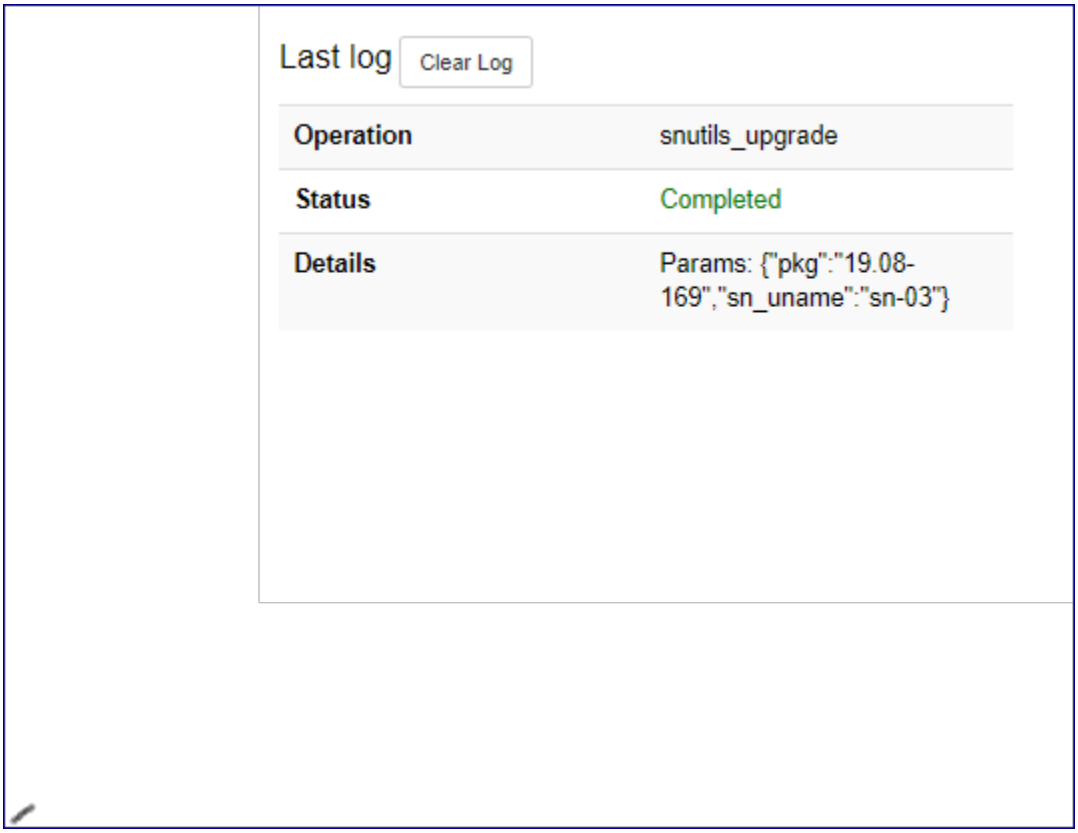
✔ Note:

Versions marked by asterisk are available but not downloaded to the cloud. Upgrade to those version requires package download and registration beforehand.

During the Utilities upgrade process status will be displayed on Command center main dashboard.

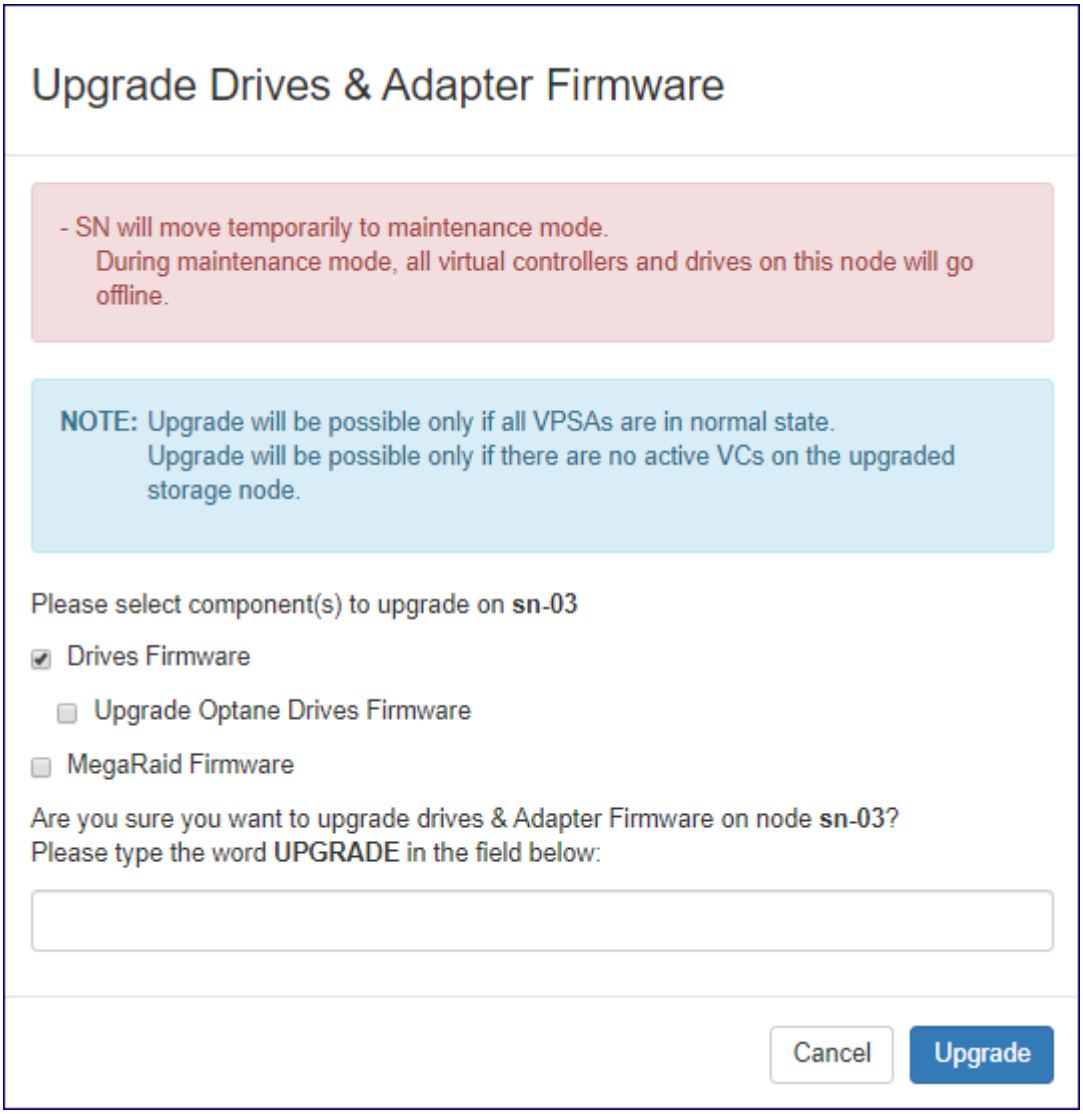


When the Storage node utilities upgrade is finished completion will be indicated on the Command center dashboard.

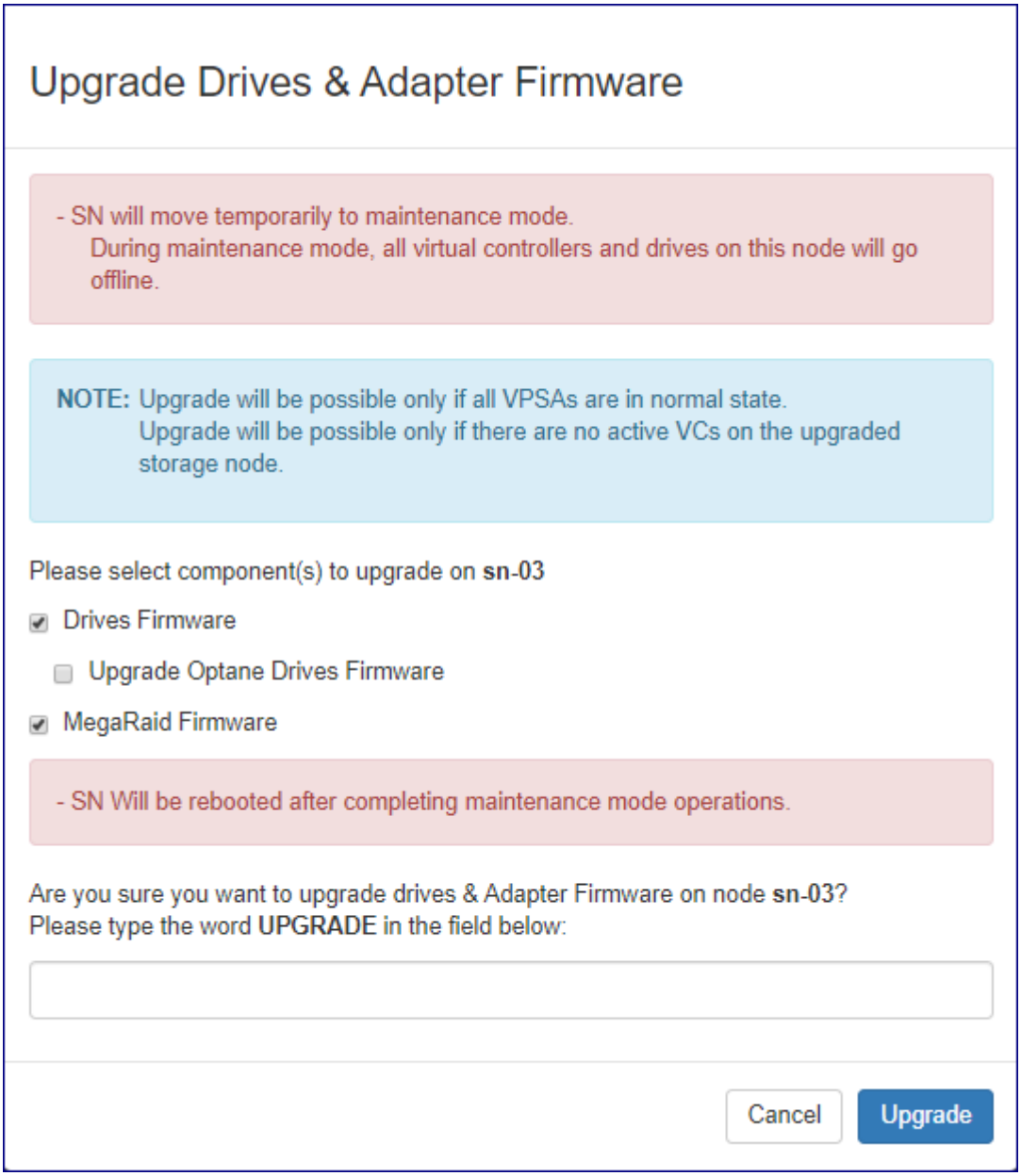


Performing upgrade of storage node disk drives\RAID controller firmware Command center can be used to trigger an update of a Storage node disk drive firmware or RAID controller firmware. Disk drive\RAID controller firmware are bundles with a specific SN software distribution and are updated according to each SW version supported levels.

To update Drive\RAID controller firmware for a Storage node navigate to the required node dashboard, click on the `Actions` button and select Upgrade Drives & Adapter Firmware. On the popup dialog that will appear select the elements you would like to perform FW upgrade for, available options are : Disk drives, Intel Optane drives and RAID controller. In case of Disk drives or Intel Optane drives FW upgrade : all disk drives and virtual controllers running on the SN will be taken offline.



In case of RAID controller FW upgrade the SN will reboot after FW is installed.



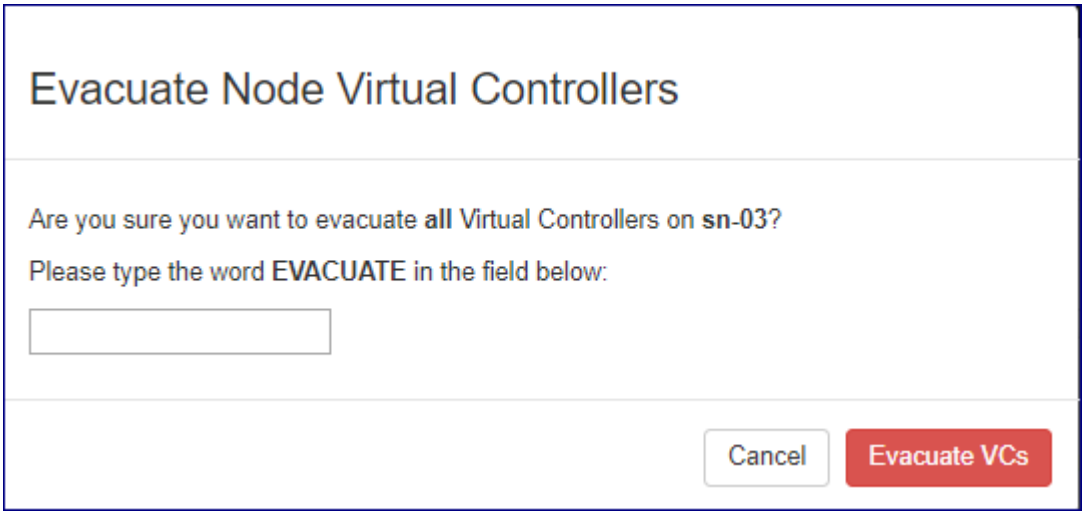
To confirm upgrade type “UPGRADE” in the text box as required and click on the `Upgrade` button.

The firmware upgrade process status will be displayed on Command center main dashboard. Completion will be also indicated on the Command Centers main dashboard.

Evacuating all virtual controllers from a storage node

To immediately free all storage node compute resources you can use Command center to evacuate all virtual controllers running on it. Evacuation of virtual controllers is useful in preparation for performing activities such as hardware maintenance or refresh.

To evacuate all virtual controllers from a storage note navigate to its dashboard, click on the `Actions` button and select Evacuate Virtual Controllers.



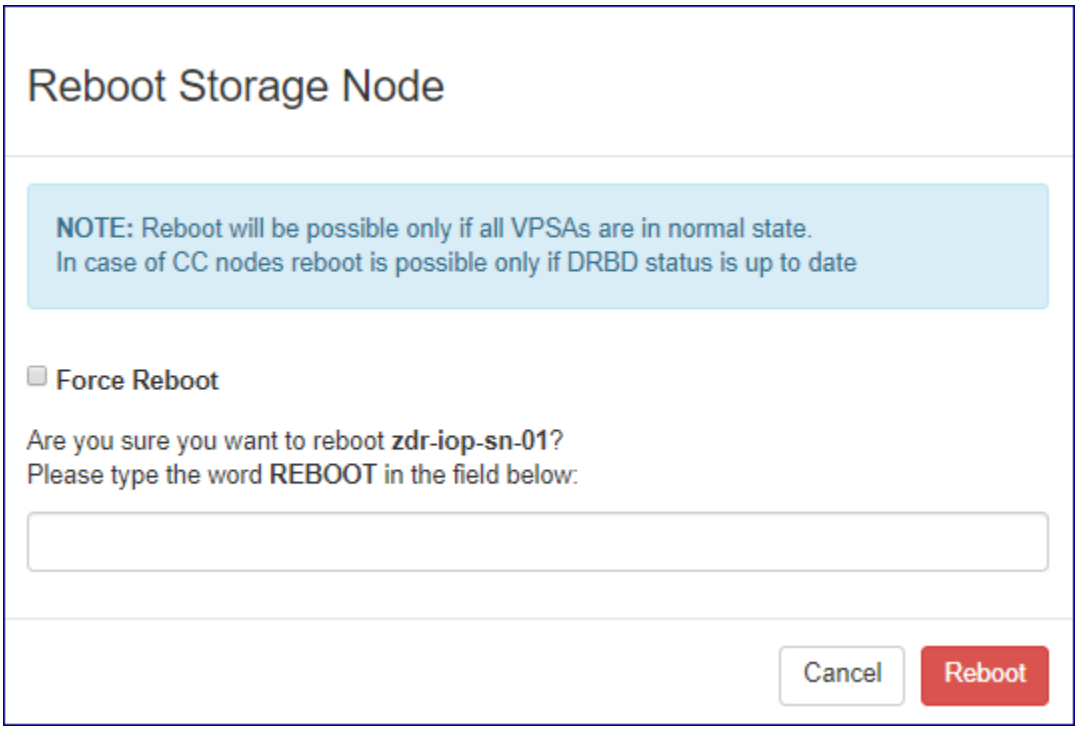
On the popup dialog that will appear type “EVACUATE” and click on `Evacuate VCs` to confirm the operation.

Note:

VC Evacuation is possible only if there is available compute capacity in other storage notes within the cloud which is appropriate for receiving the evacuated VCs (maintaining dual controller HA for VPSA and Object storage fault domain demands).

Reboot a storage node

To reboot a Storage node navigate to its dashboard `Actions` button and select Reboot.

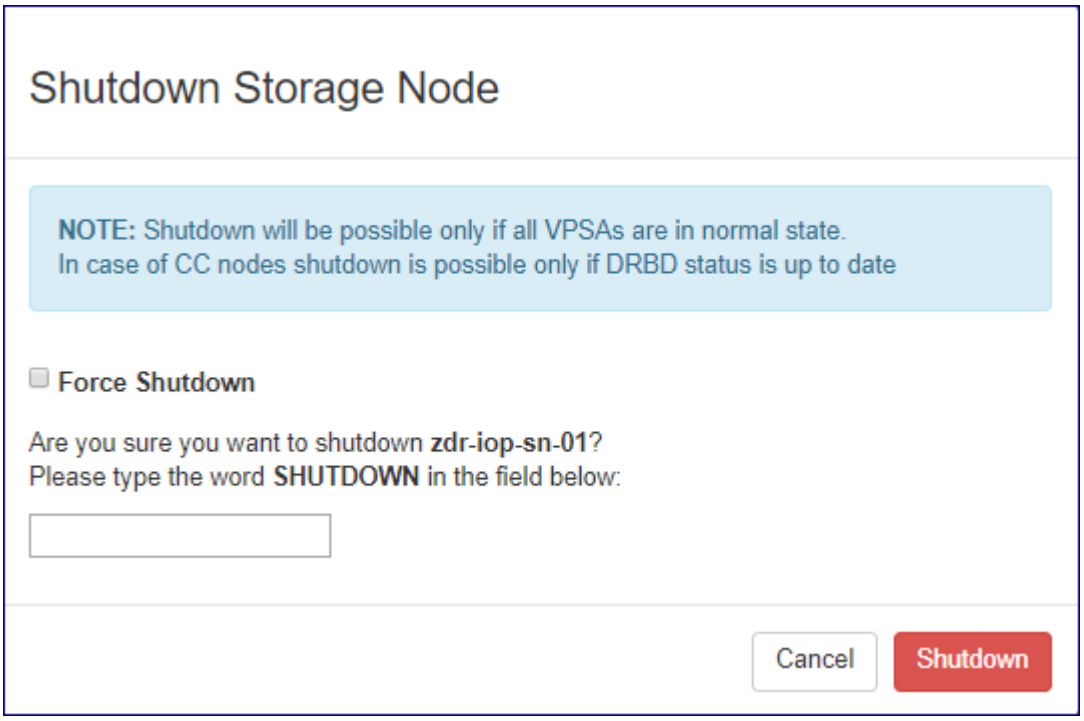


On the popup dialog that will appear confirm the reboot operation by typing reboot on the textbox as requested and clicking on the `Reboot` button.

✔ **Note:**

Storage Node reboot will be performed only if all underlying VPS/ VPSA Object storage instances status is Normal.
A reboot of CCmaster\CCslave will be performed only if the DRBD service is up to date.
The restrictions noted above can be overridden by checking the Force reboot option. When using Force reboot option the cloud administrator is considered responsible of verifying and validating the VPSA/DRBD status before rebooting.

Shutdown a storage Node To shut down a Storage node navigate to its dashboard `Actions` button and select Shutdown.



On the popup dialog that will appear confirm the reboot operation by typing reboot on the text box as requested and clicking on the `Shutdown` button.

✔ **Note:**

Storage Node shutdown will be performed only if all underlying VPS/ VPSA Object storage instances status is Normal.
A shutdown of CCmaster\CCslave will be performed only if the DRBD service is up to date.
The restrictions noted above can be overridden by checking the Force Shutdown option. When using the Force Shutdown
option the cloud administrator is considered responsible of verifying and validating the VPSA/DRBD status before shutting down the SN.

CHAPTER

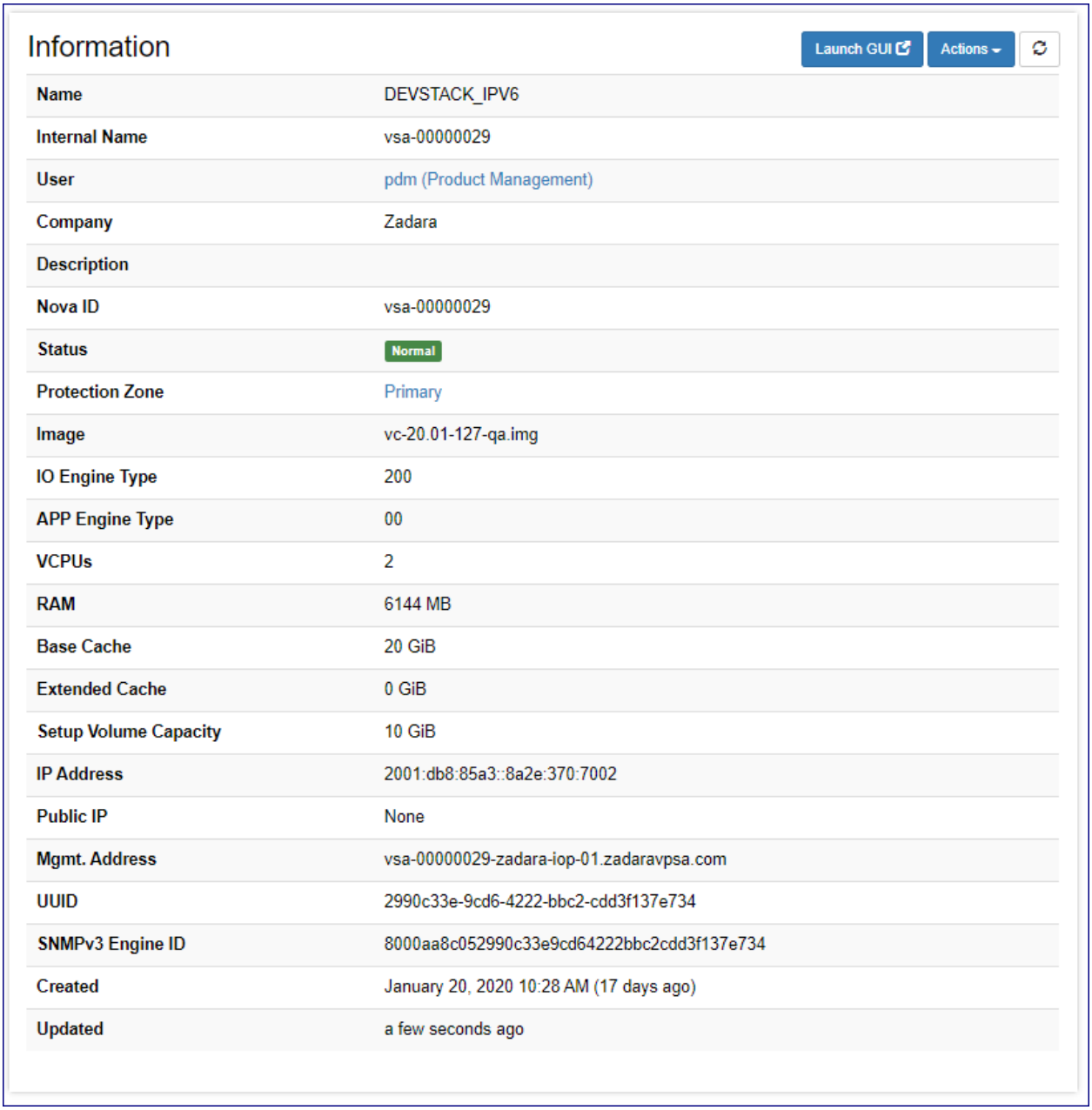
FIVE

MANAGING VPSAS

Virtual private storage array instances running in the cloud can be centrally managed and monitored by cloud admins from Command center. Command center VPSA management feature set provides administrators with a single pain of glass in which the receive a holistic image of the underlying instances status and operations and allows for enforcements of policies, lifecycle management and supervised resource distribution.

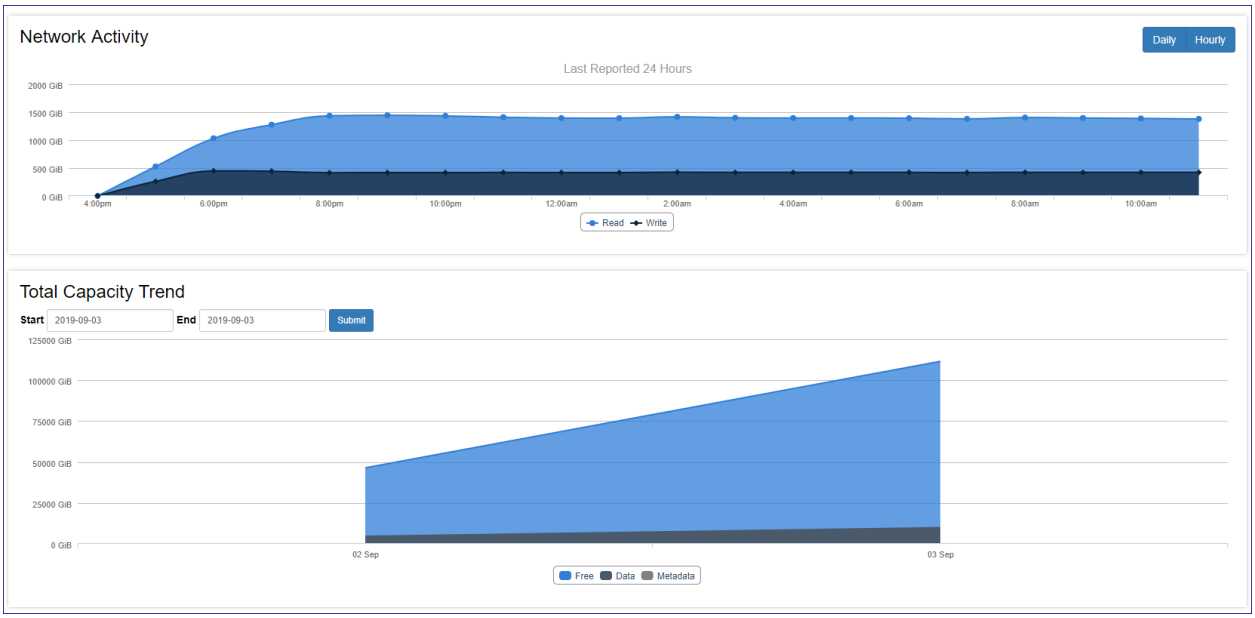
5.1 Viewing Virtual Private Storage Array Properties

Specific VPSAs can be reached by clicking on the VPSAs label on Command centers left menu panel and selecting the appropriate Instance from the displayed list. The VPSA main dashboard tab provides information regarding its configuration, current health status and network topology.

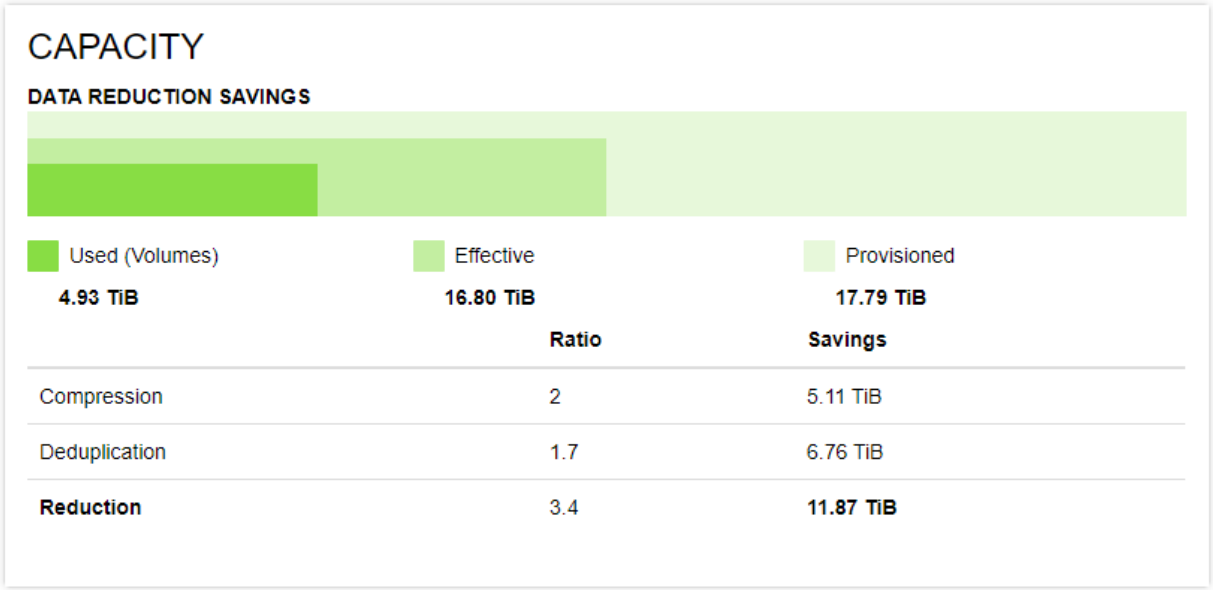

Information
Launch GUI
Actions
Name
DEVSTACK_IPV6
Internal Name
vsa-00000029
User
pdm (Product Management)
Company
Zadara
Description
Nova ID
vsa-00000029
Status
Normal
Protection Zone
Primary
Image
vc-20.01-127-qa.img
IO Engine Type
200
APP Engine Type
00
VCPUs
2
RAM
6144 MB
Base Cache
20 GiB
Extended Cache
0 GiB
Setup Volume Capacity
10 GiB
IP Address
2001:db8:85a3::8a2e:370:7002
Public IP
None
Mgmt. Address
vsa-00000029-zadara-iop-01.zadaravpsa.com
UUID
2990c33e-9cd6-4222-bbc2-cdd3f137e734
SNMPv3 Engine ID
8000aa8c052990c33e9cd64222bbc2cdd3f137e734
Created
January 20, 2020 10:28 AM (17 days ago)
Updated
a few seconds ago

Property	Description
Name	Instance display name
Internal Name	internal instance name
Company	Creating user company
Description	Description given while instance was provisioned
Nova ID	Nova ID for this instance
Status	Current Instance status
Protection Zone	Instance protection zone configuration
Image	Instance deployment image
IO Engine Type	VPSA IO Engine Flavor
App Engine Type	VPSA APP Engine Flavor
VCPUs	Instance VCPU count
RAM	Instance Configured RAM capacity
Base cache	Instance Base Cache capacity
Extended Cache	Instance Extended SSD cache configured capacity
Setup Volume Capacity	Instance setup volume capacity
IP Address	Instance Floating frontend IP address
Public IP	Instance public IP address
Mgmt. Address	Instance hostname for management access
UUID	Instance UUID
SNMPv3 Engine ID	Instance SNMPv3 EngineID
Created	Creation timestamp
Updated	Last update timestamp

The main dashboard also contains monitoring charts regarding the VPSA capacity utilization and Network activity.



For VPSA Flash array the main dashboard also contains a data reduction savings chart presenting used capacity vs. provisioned and effective capacity. The Flash Array Data reduction tile also includes information about savings from inline data deduplication and inline data compression and the VPSA overall data reduction ratio.



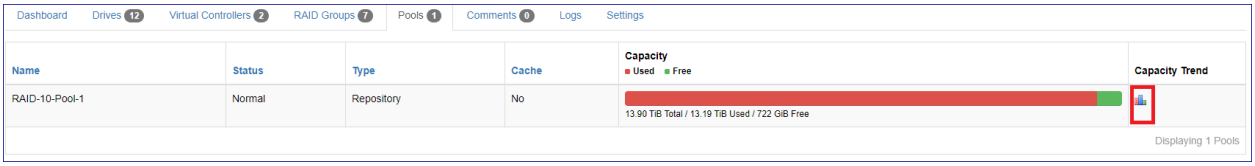
The VPSA resource tabs provides information regarding underlying resources attached to the VPSA:

- Physical drives
- Virtual controllers
- RAID groups
- Pools

Note:

The RAID group tab also displays information on internal groups such as Metering and journal which are not visible or accessible to VPSA users.

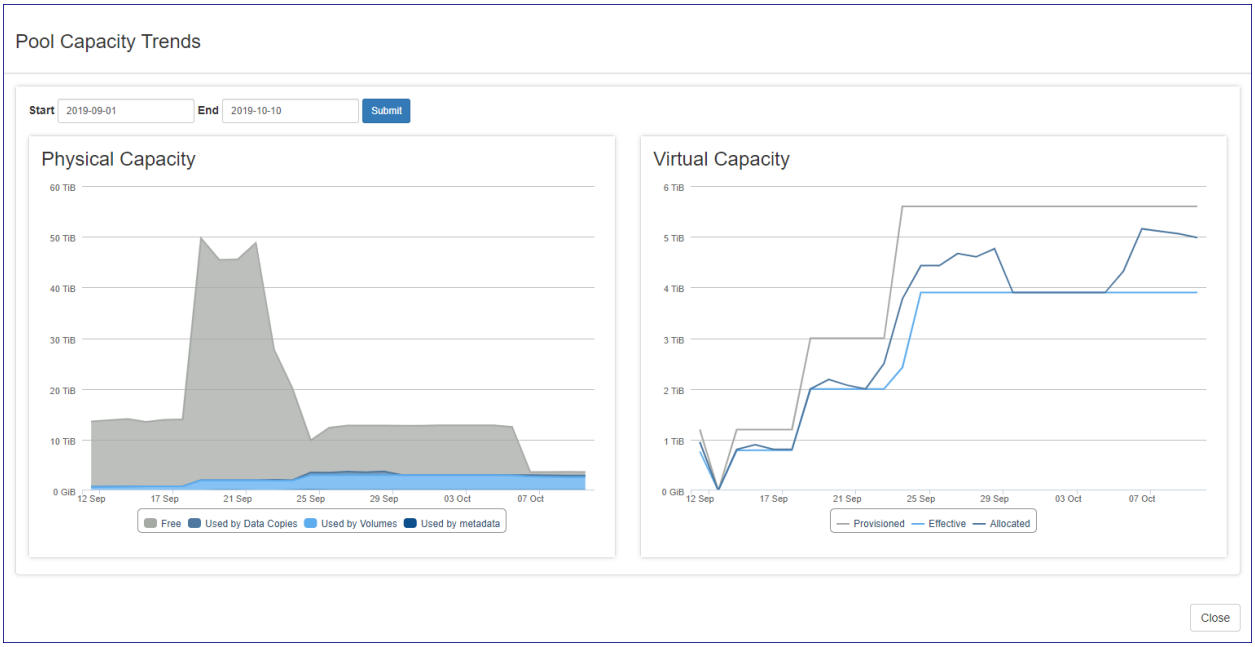
The VPSA Pools tab contains pool capacity consumption trend charts that provides cloud administration with an overview of the pools capacity change over time and the effect of data reduction mechanisms such as deduplication and compression on all flash VPSA pools. To present the capacity trend for a specific pool navigate to the VPSA pools tab, select the required pool and click on the relevant chart icon on the capacity trend column.



The pool capacity charts display differs between a hybrid VPSA and a Flash VPSA:

An all flash VPSA pool capacity trend display contains 2 charts:

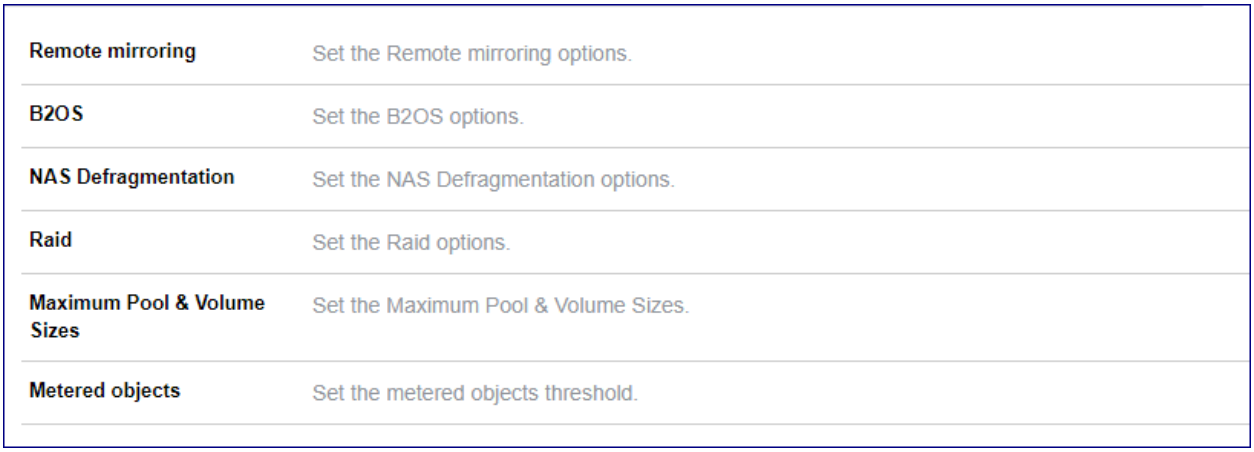
- Overall pool capacity trend over time
- Provisioned capacity vs. virtual capacity and effective capacity over time



A hybrid VPSA pool capacity trend contains only the Overall pool capacity trend over time chart.

5.2 Configuring Virtual Private Storage Array Settings

To view or alter VPSA settings click on the Settings tab on the VPSA dashboard.



5.2.1 Remote mirroring properties

Parameter	Description
Dst total quota pc	Allowance for amount of unapplied data for all VPSA mirror jobs 0 - No quota enforcement
Connections count	Number of TCP sessions established between two VPAs performing mirroring

5.2.2 Backup to object storage(B2OS)

Parameter	Description
Src buffers count	Amount of source buffers allocated for B2OS activities
Dst buffers count	Amount of destination buffers allocated for B2OS activities

5.2.3 NAS defragmentation

Parameter	Description
Minimum extents count	Amount of extents a file needs to have to be considered for defragmentation

5.2.4 RAID

Parameter	Description
Allow mixed types	Is HDD type mixture in RAID group/pool allowed?

5.2.5 Maximum Pool & Volume Sizes

Parameter	Description
Pool transactional max size	Maximum capacity(TB) of a transactional pool
Pool repository max size	Maximum capacity(TB) of a repository pool
Pool archival max size	Maximum capacity(TB) of a archival pool
Pool depot max size	Maximum capacity(TB) of a depot pool

5.2.6 Metered objects

Parameter	Description
Check interval	Interval in seconds for validation of metered objects threshold alerts
Report interval	Interval in seconds for rate limiting all metered objects thresholds alerts
Read cache late IO threshold	Amount of read hit IO operations with late time exception required to trigger an alert
Read cache late IO threshold time(ms)	Read hit IO operation service time value that is considered as late IO
Write cache late IO threshold	Amount of write hit IO operations with late time exception required to trigger an alert
Write cache late io threshold time (ms)	Write hit IO operation service time value that is considered as late IO
Enable metering upload agent	Enable upload of metering data to an external cloud repository

5.2.7 Ticket Settings

See Managing Cloud Settings > Management Settings in this manual for details regarding the ticket settings section.

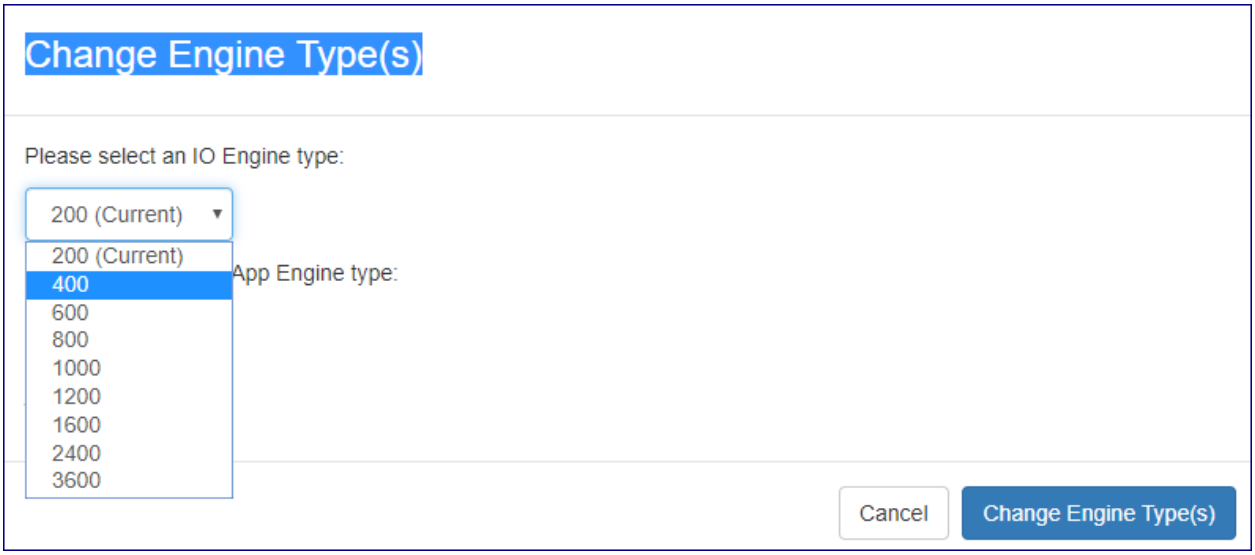
5.3 Performing Virtual Private Storage Array Operations

5.3.1 Changing VPSA engine configuration

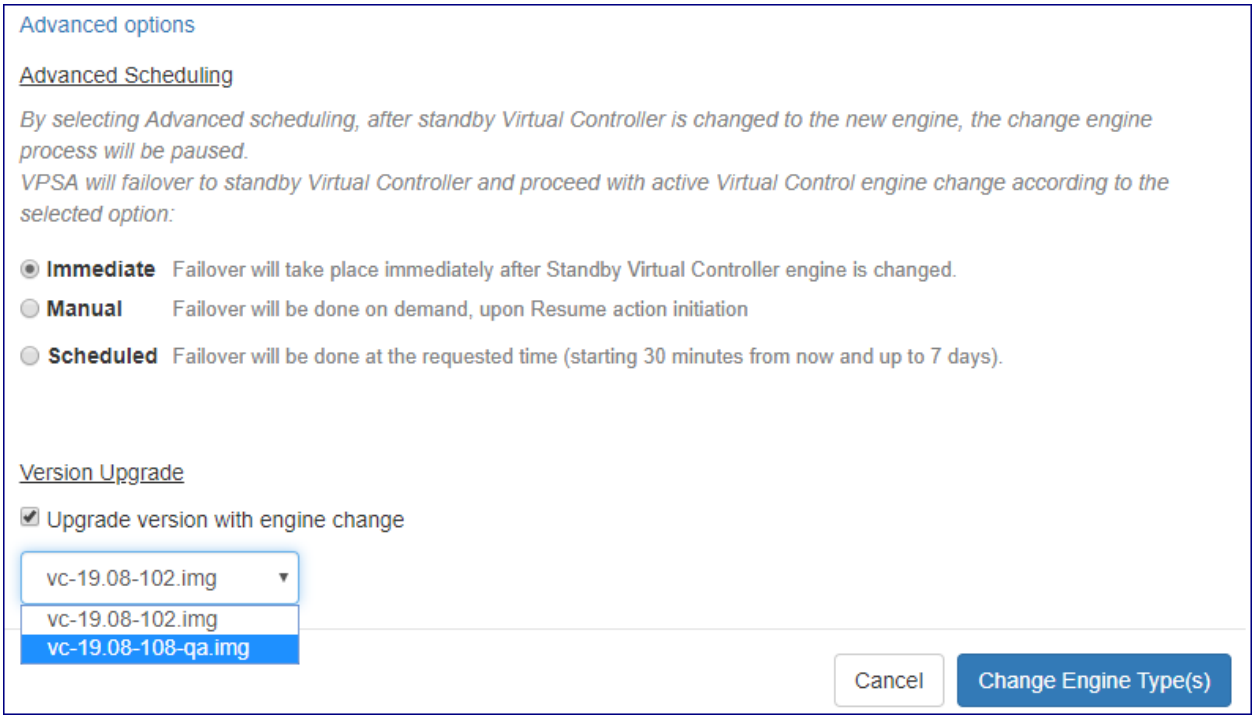
Command center can be used to modify a VPSA engine type (to a bigger or smaller engine) and to add or change configuration of a VPSA ZCS engine.

To change engine configuration click on the `actions` button from the VPSA dashboard and select Change Engine Type(s) from the dropdown.

In the popup window that will appear select the type of VPSA engine you would like to shift to and/or the type of ZCS engine.



You can also configure advanced option for the model change process by clicking on Advanced options



option	Description
Advanced scheduling	Configure when does the engine change process performs required virtual controller failover: `Immediate` Failover will take place immediately after Standby Virtual Controller engine is changed(default) `Manual` Failover will be done on demand, upon Resume action initiation `Scheduled` Failover will be done at the requested time (starting 30 minutes from now and up to 7 days).
Version upgrade	Perform VPSA version upgrade alongside the engine model change process

Click on the `Change Engine Type(s)` button to proceed and approve the operation in the popup windows that will appear. The engine reconfiguration process will commence and your VPSA status will be modified to change engine and will be remodified to Normal as the process concludes.

5.3.2 Adding physical drives

To add physical drives to a VPSA click the `Actions` button then select Add drives from the dropdown. On the popup dialog that will appear select the number of drives to be added and the drive type. Click on the `Add drives` button, the request will be submitted.

Note:

- New drives added to a VPSA will not be associated with a RAID group or data pool. The VPSA administrator will be required to configure drive association.
- zStorage enforces the limits of maximum permitted drives per VPSA engine model, and they cannot be exceeded.

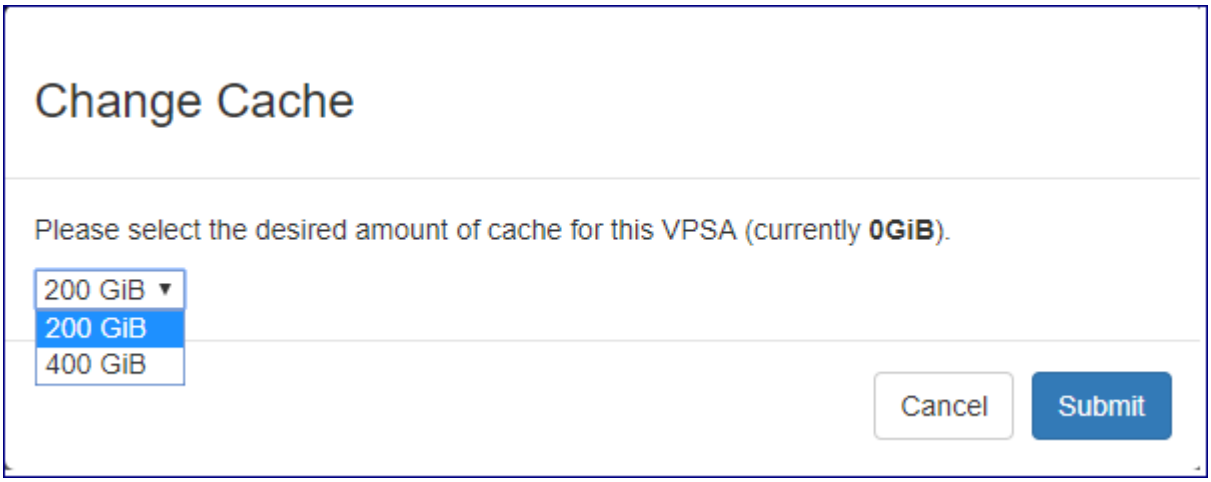
5.3.3 Change VPSA cache configuration

Cloud Administrators can use Command center to change the Flash cache configuration of a VPSA and add/remove Flash cache capacity on top of the specific model baseline.

Note:

VPSA model 200 does not support extended flash cache.

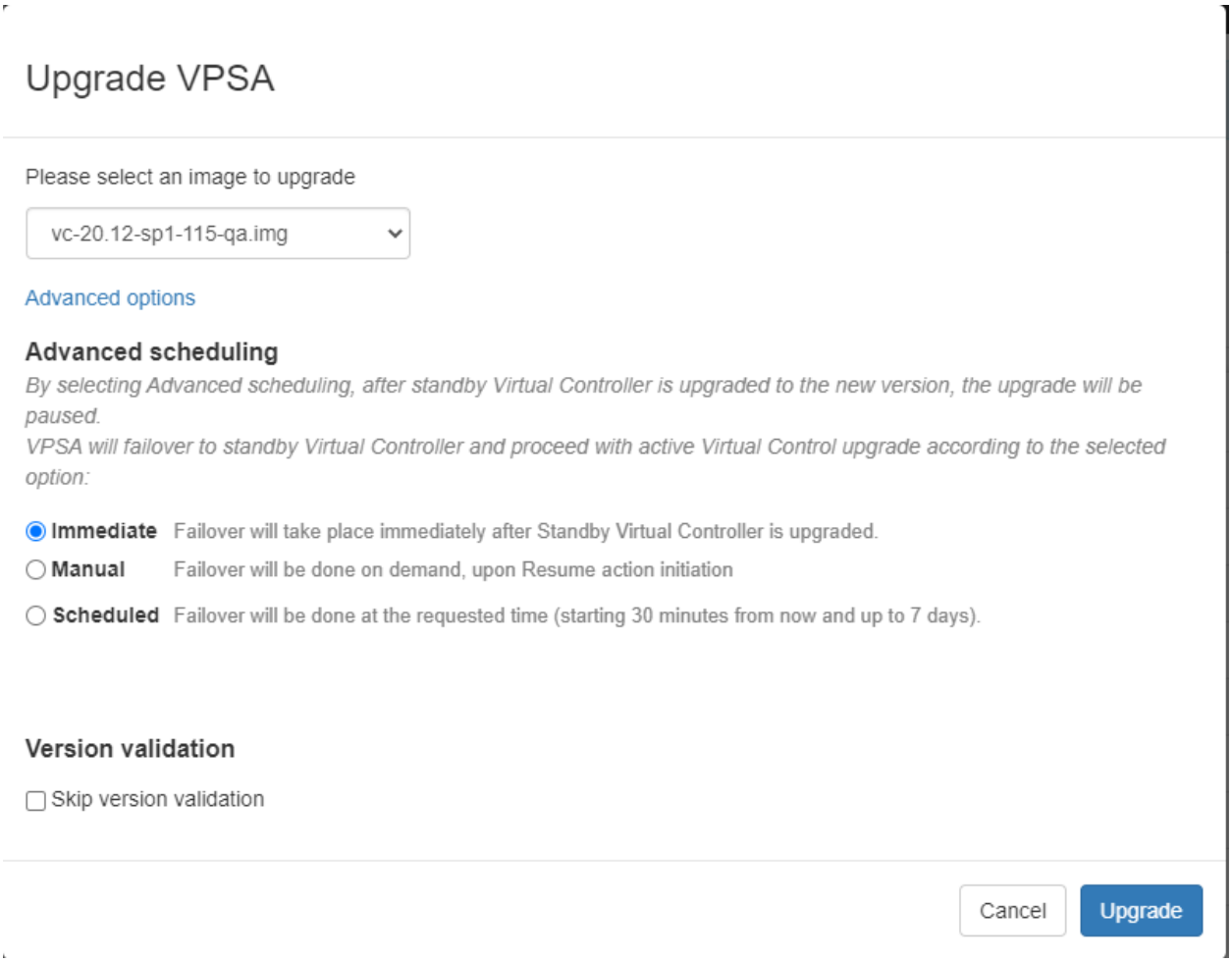
To change cache configuration for a specific VPSA click the `Actions` button then select Change Cache from the dropdown. On the popup dialog that will appear select the new cache configuration you would like to apply for the VPSA and click on the `Submit` button to confirm.



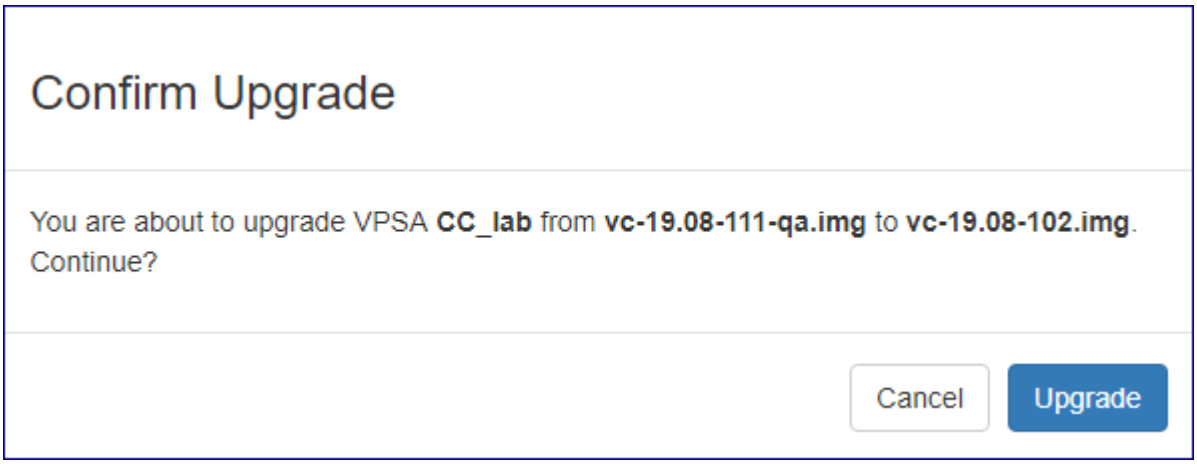
5.3.4 Upgrading a VPSA

Command center allows administrators to perform version upgrade on the VPSA instances running in the cloud. To perform version upgrade click on the `Actions` button then select Upgrade from the dropdown.

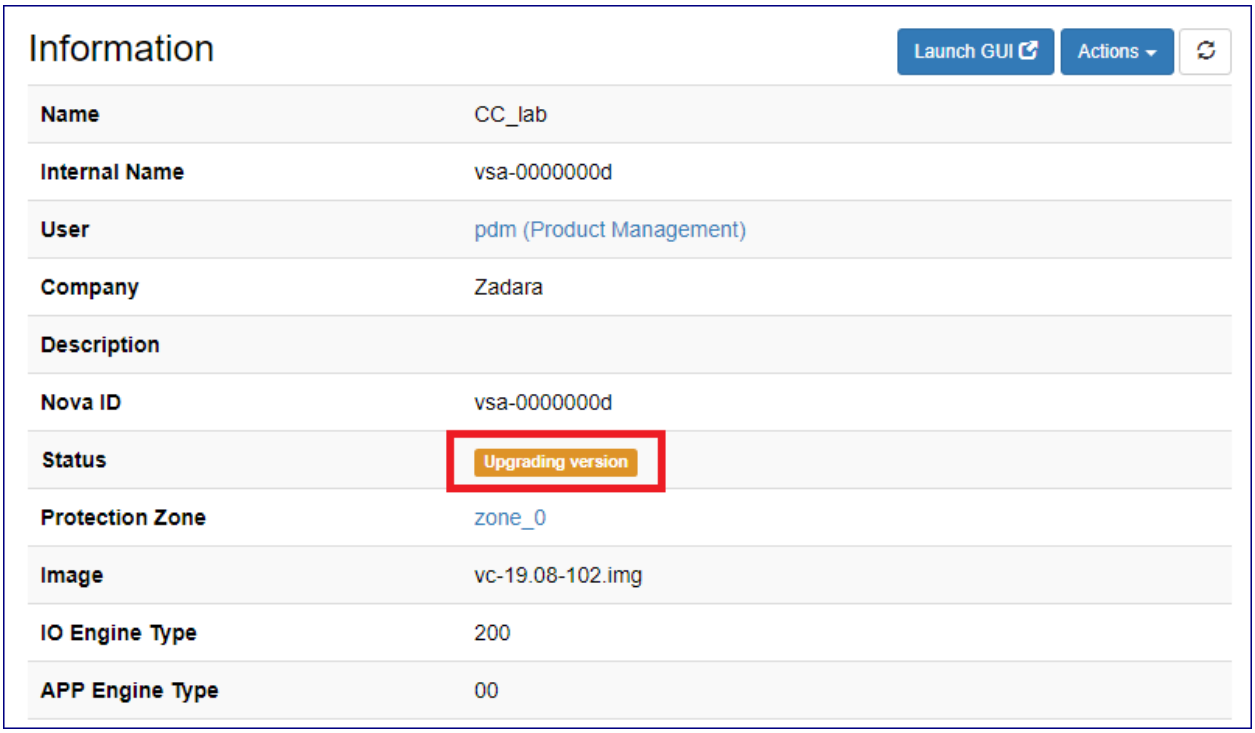
On the popup dialog that will appear select the specific image level to which you would like to upgrade to. Advanced options for upgrade can also be selected these options include the ability to schedule the VPSA upgrade and perform an manual VPSA upgrade (failover performed manually by admin). You can also request that version checking will be skipped in the upgrade process. to finalize selection click on the `Upgrade` button .



Another Pop up dialog will appear requesting confirmation for upgrading to the selected version click on the `Upgrade` button to confirm the process.



The request will be submitted and the VPSA status property will change to Upgrading version while the process is running.



When the VPSA version upgrade process is completed the status property will be changed back to Normal.

✔ Note:

A scheduled VPSA upgrade operation performs an immediate upgrade of the passive virtual controller.

5.3.5 Canceling a Scheduled VPSA upgrade

For VPSAs in version 20.12 and above who was set up for a scheduled upgrade operation this scheduled upgrade can be canceled from Command Center.

To cancel a scheduled upgrade click on the `Actions` button then select Cancel Scheduled upgrade from the dropdown. on the popup window that will appear confirm upgrade cancellation and the scheduled upgrade will be canceled.

✔ **Note:** As a scheduled upgrade operation performs an immediate upgrade of the passive virtual controller, canceling a scheduled upgrade will revert the passive virtual controller back to the base version.

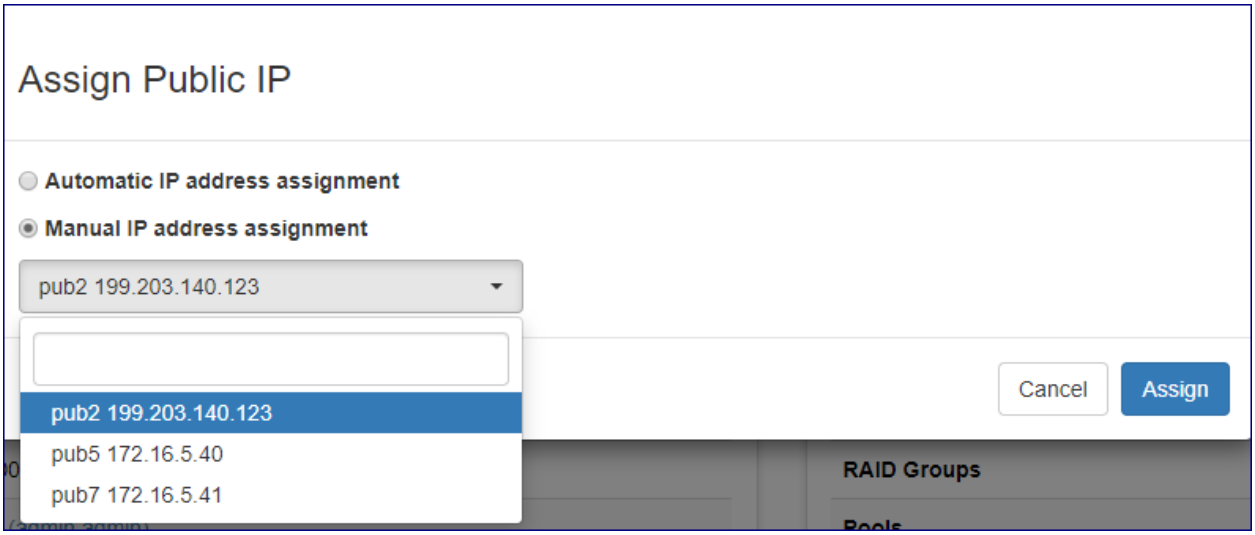
5.3.6 Assigning a Public IP address to a VPSA

In specific cases where a VPSA needs to be available for management access from outside of his Cloud allocated VLAN, a public IP address can be assigned to it. On information regarding the definition of Cloud level public IP ranges please refer to Creating Public IP addresses in this manual.

To assign a public IP address go to the appropriate object storage instance and click the `Actions` button and select assign public IP from the dropdown.

✔ **Note:**

- From cloud version 20.12, an upgrade to a VPSA version that is more than 2 major releases after the current version will be blocked by Command Center.
- From cloud version 20.12, VPSA version downgrades are blocked by Command Center.



Public IP addresses can be automatically assigned from a cloud level pool or manually selected. To automatically assign a public IP address: On the popup dialog that will appear make sure Automatic IP address assignment is selected and confirm the operation by clicking on the `Confirm` button. To manually select a specific public IP address: On the popup dialog that will appear select Manual IP address assignment, select the required public IP and confirm the operation by clicking on the `Confirm` button.

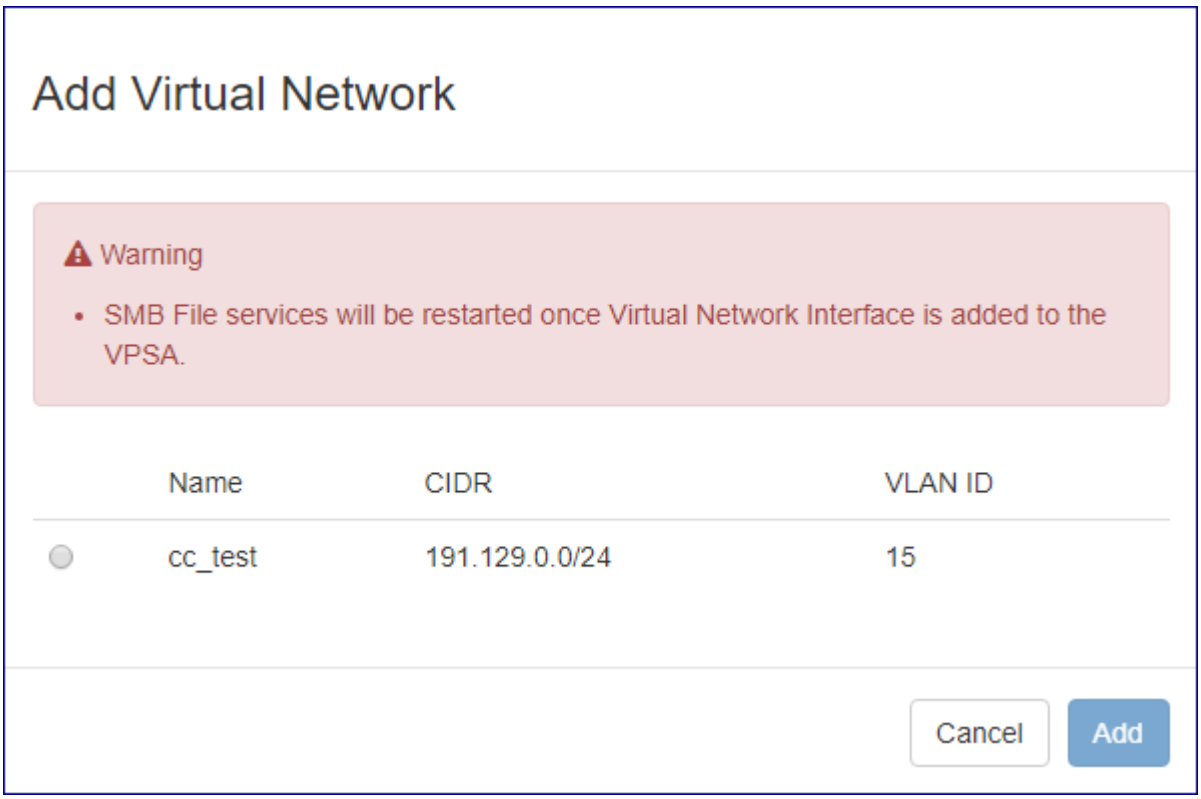
✔ **Note:**

- Manual public IP assignment is only available for VPSAs in version 20.01 and later.
- Public IP is not supported for VPSA object storage instances with IPV6 frontend addresses.

5.3.7 Adding or removing a VPSA's virtual network

An existing VSPA is created with one primary virtual network and can be assigned with additional virtual networks. VPSAs connected to multiple networks can be utilized to Enable use cases requiring per volume partitioning/isolation.

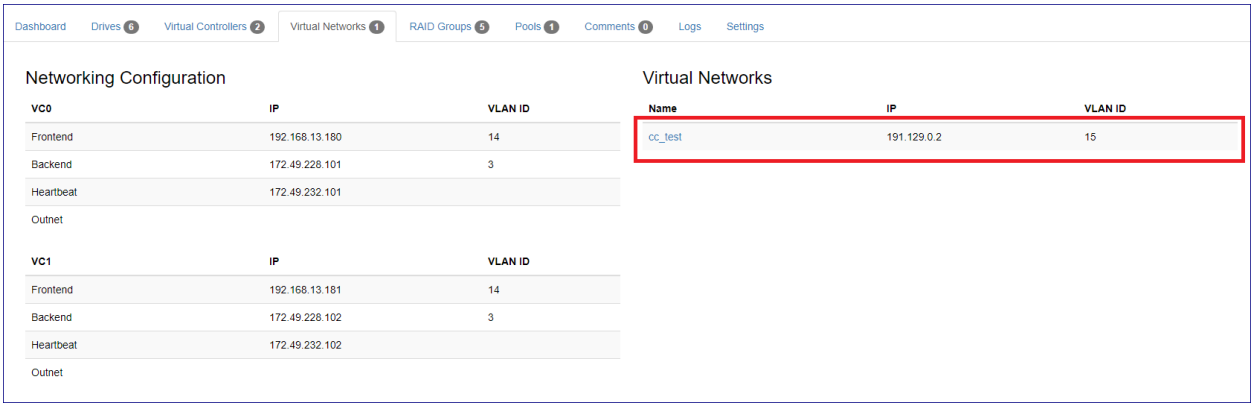
To assign a virtual network to a VPSA first make sure that an appropriate virtual network is defined in the cloud (except the one already used by the VPSA). Click the `Actions` button and select Add Virtual Network from the dropdown.



On the popup dialog that will appear select the appropriate virtual network and confirm the operation by clicking on the **Add** button.

> **Warning:**
>
> Addition of a virtual network will restart SMB services causing existing mapped shares to be temporarily unavailable.

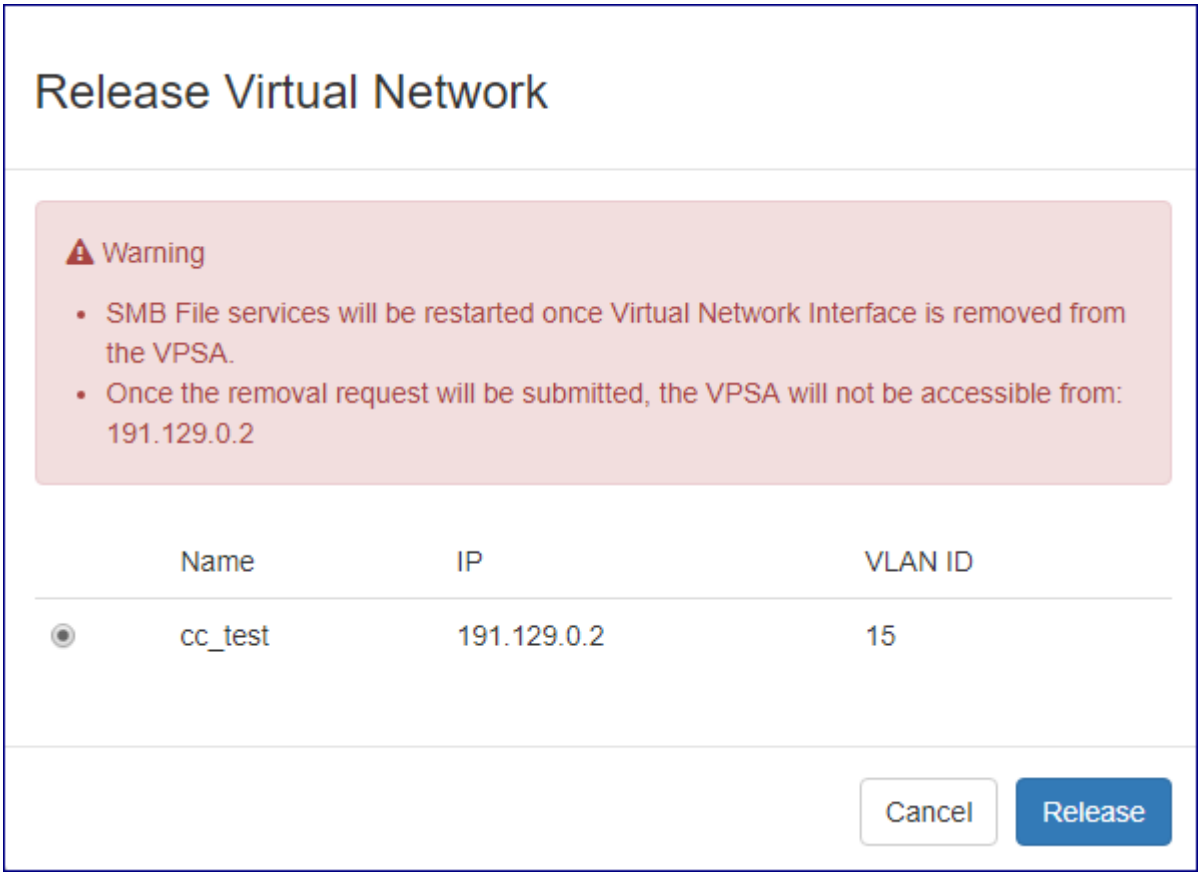
When the add operation completes the newly added virtual network should be displayed in the VPSA virtual networks tab.



Note:

- Number of virtual networks per VPSA is limited to 5.
- VPSA REST API/GUI is accessible through any virtual networks.
- Only Primary virtual networks IP is registered in DNSimple
- VPSA can't have two virtual networks with the same VLAN.
- Only "Primary Virtual Network" is a routable network. Remaining virtual networks are not routable.
- Active Directory can be joined only through "primary virtual network".
- Backup (B2OS), Mirror, Remote Clone through FE network are only allowed via the "primary virtual network".
- ZCS container services exposed through FE network can be done only on "primary virtual network".
- "iSER" host connectivity is available only on the "Primary Virtual Network".

To release a virtual network from a VPSA click the `Actions` button and select Release Virtual Network from the dropdown.

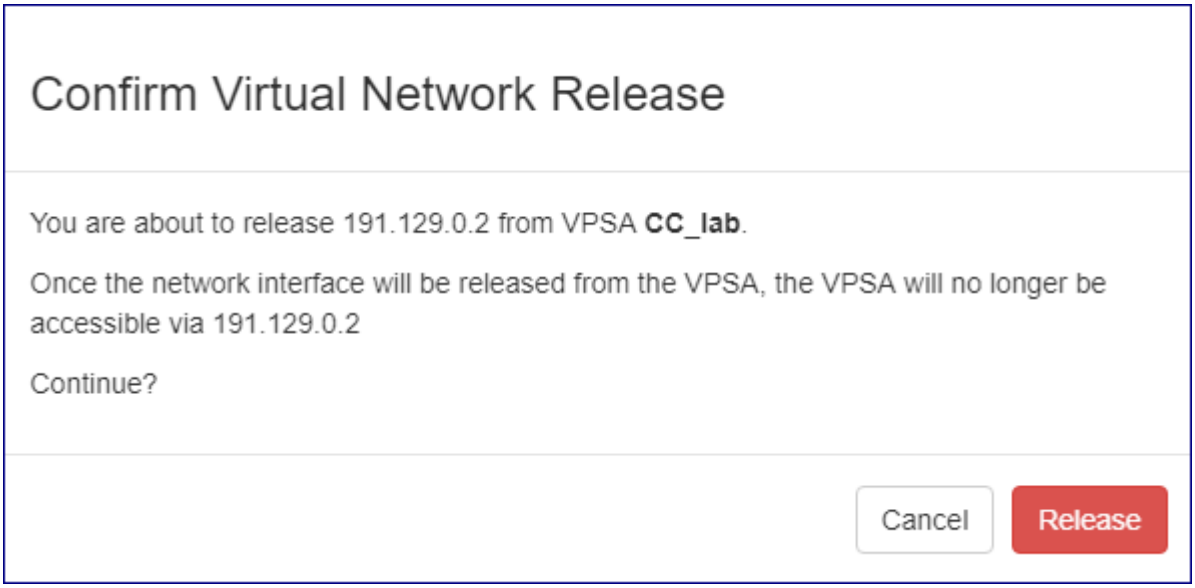


On the popup dialog that will appear select the appropriate virtual network and confirm the operation by clicking on the `Release` button.

Note:

Release of a virtual network will restart SMB services causing existing mapped shares to be temporarily unavailable. The exact reaction to such disconnections is dependent on the underlying application that is using the files shares.

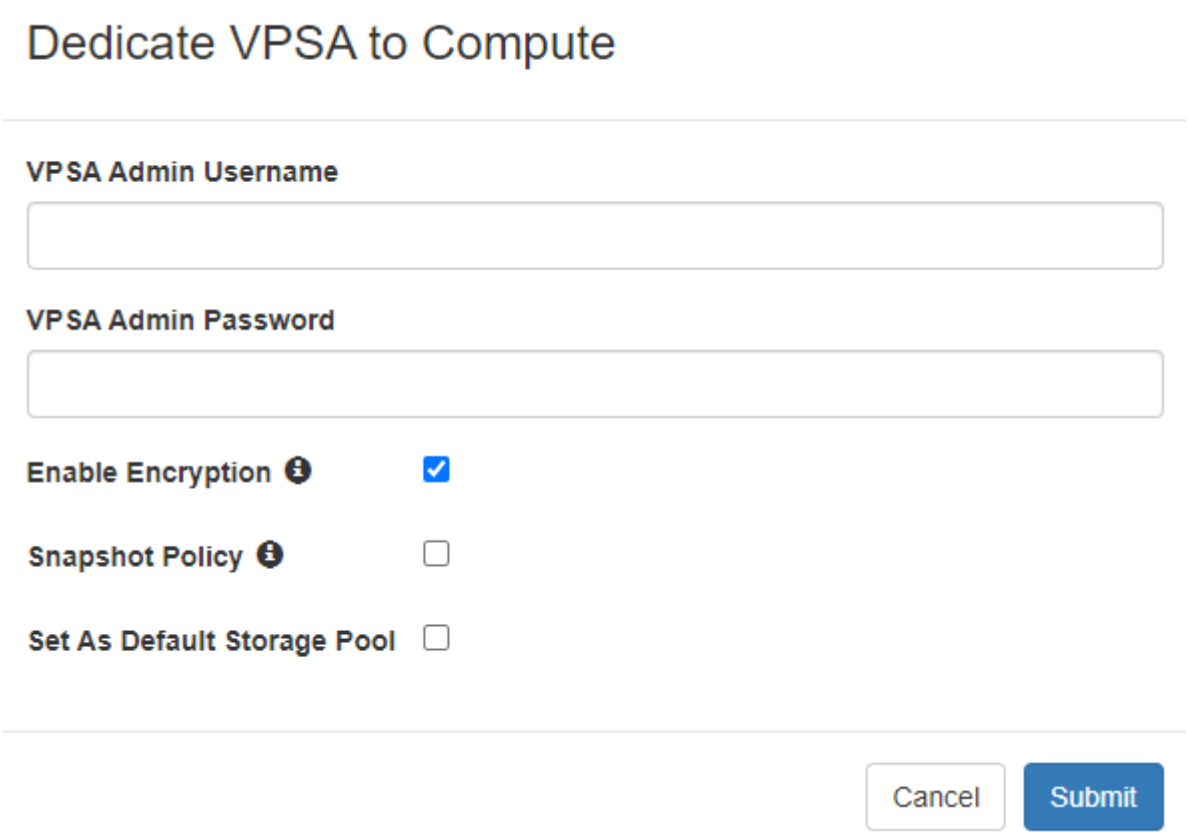
Reconfirm the release operation on the popup dialog that will appear by clicking the red `Release` button.



5.3.8 Dedicating VPSA to a zCompute cloud

A VPSA can be connected to a zCompute cloud to be utilized as a backend to a Storage Pool (used for creation of EBS compatible block volumes for zCompute VMs). A VPSA connected to zCompute cloud is used solely for this compute cloud and therefore “dedicated” to it.

To dedicate a VPSA to a zCompute Cloud, click the `actions` and select **Dedicate VPSA to Compute** from the dropdown.



On the popup dialog that will appear provide the following :

- An admin username for this VPSA to be used by zCompute for VPSA API
- The admin user password

You can also toggle :

- Volume encryption for the compute cloud block volumes provisioned from this VPSA
- The use of VPSA default snapshot policies for the compute cloud block volumes
- Whether this VPSA will be attached to the zCompute cloud default storage pool.

After providing all required information click on `submit` to confirm dedication of this VPSA .

The operation will commence. If it concludes successfully the VPSA will be marked with a

label.

5.3.9 Releasing a VPSA from zCompute cloud dedication

A VPSA dedicated to zCompute cloud can be released from its dedication.

To release a VPSA from compute cloud dedication click the `actions` and select Release VPSA from Compute from the dropdown.

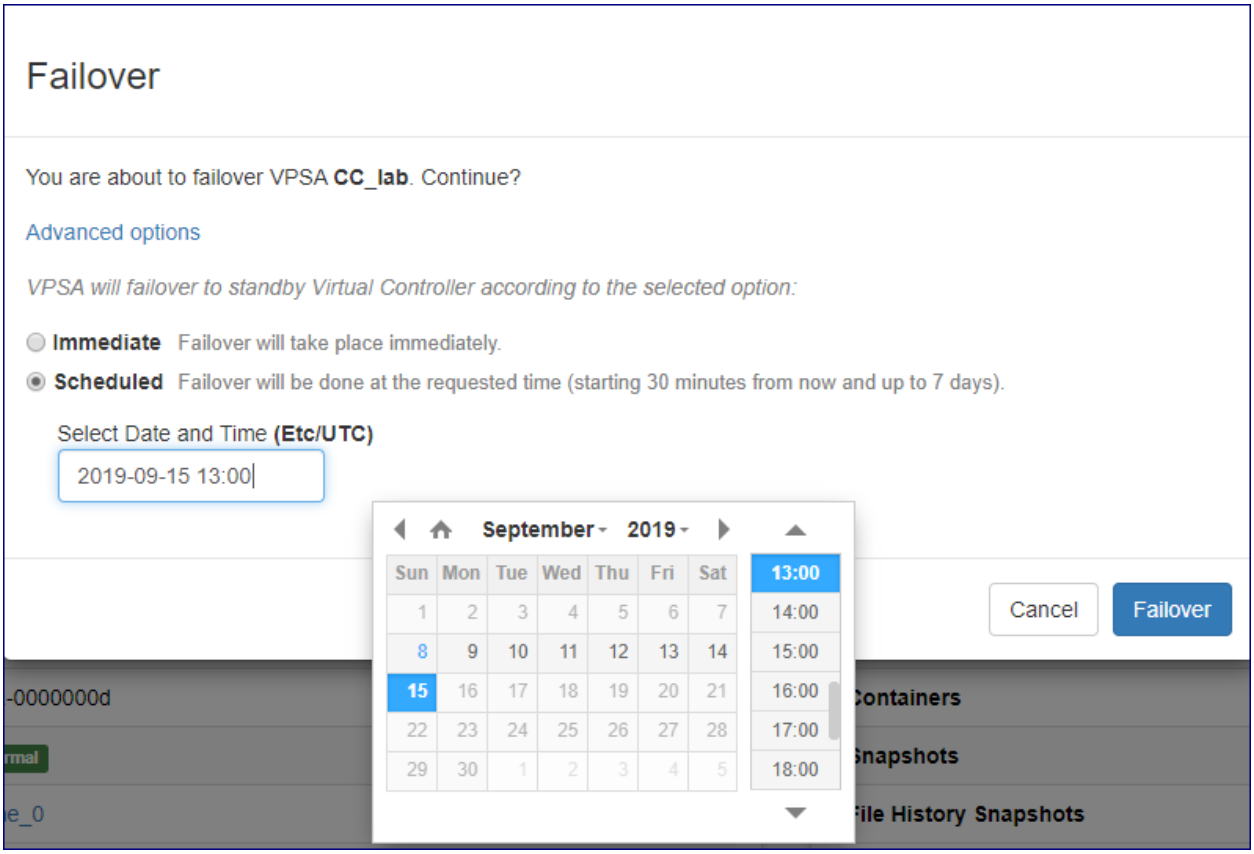
On the popup dialog that will appear confirm release by clicking on the `submit` button.

5.3.10 Performing managed virtual controller failover

Command center can be used to trigger a managed VPSA failover to its standby virtual controller. Managed failover can be used by cloud administrator to evacuate all active virtual controllers from a specific Storage node before infrastructure operations or hardware replacement.

> **Warning:**
>
> Virtual controller failover restart SMB services causing existing mapped shares to be temporarily unavailable.
> The exact reaction to such disconnections is dependent on the underlying application that is using the files shares.

To perform virtual controller failover click the `Actions` button and select Failover from the dropdown. Failover can be performed immediately or be scheduled to a specific date and time.



To perform immediate Failover: on the popup dialog that will appear confirm the action by clicking on the `Failover` button or click on the advanced settings link and make sure that failover is set to immediate and then click on the `Failover` button.

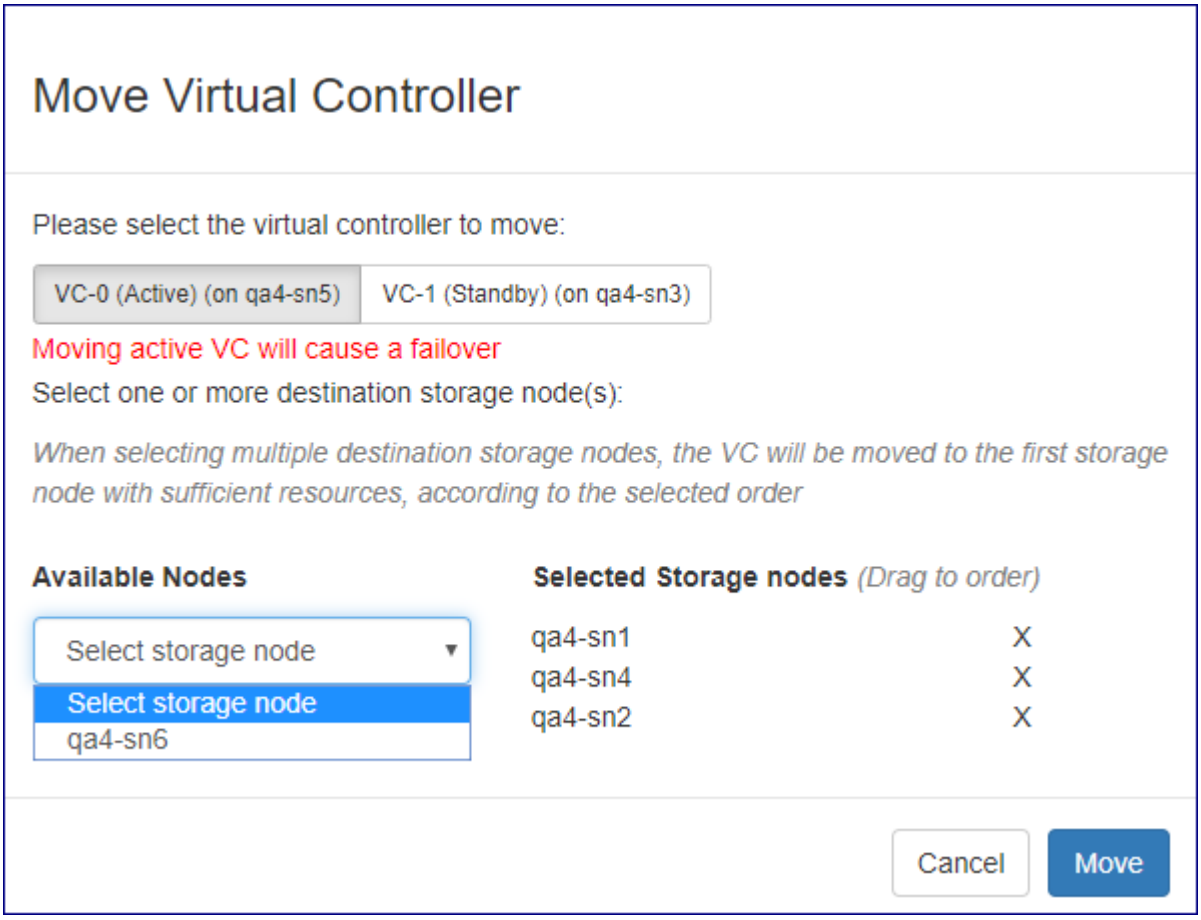
To schedule failover to a specific point in time: on the popup dialog that will appear click on the advanced settings and select Scheduled, select the date and time in which failover should be performed and then click on the `Failover` button.

The failover process will be initiated, Failover status and progress can be monitored from the VPSA log tab.

5.3.11 Moving a virtual controller

In cases where the cloud Storage Node inventory & capacity are sufficient- virtual controllers can be moved from the SN the currently reside in to another. Both primary and secondary virtual controllers can be moved, moving the primary virtual controller will trigger a failover operation prior to its relocation.

to move a virtual controller failover click the `Actions` button and select Move Virtual controller from the dropdown.



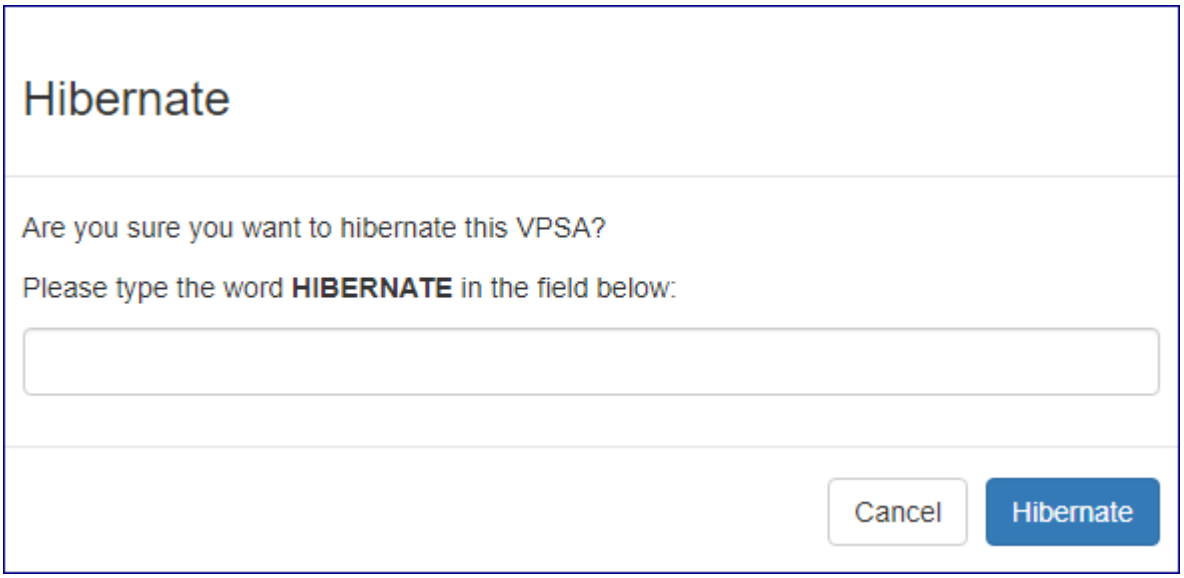
Select the virtual controller you want to relocate and select one or more storage nodes as the destination, in case multiple storage node a slected relocation will be performed to the first SN that has sufficient resource capacity. to confirm relocation click on the `Move` button.

✔ **Note:** Virtual controllers that belong to a VPSA instance older than version 20.01 cannot be spawned on Storage Nodes with ConnectX-5 NICs.

5.3.12 Hibernate a VPSA

VPSA Hibernation will take the instance offline and free its consumed resources (vCPU , RAM) on the Storage Nodes level. Hibernation of a VPSA will also reduce its associated service cost. For VPSA in a hibernated state only drives are billed. Hibernating a VPSA involves the process of deleting its Virtual Controllers (the VPSA) while maintaining the data drives and all the necessary metadata to resume its operation at a later stage. Resuming a hibernated VPSA only takes a few minutes.

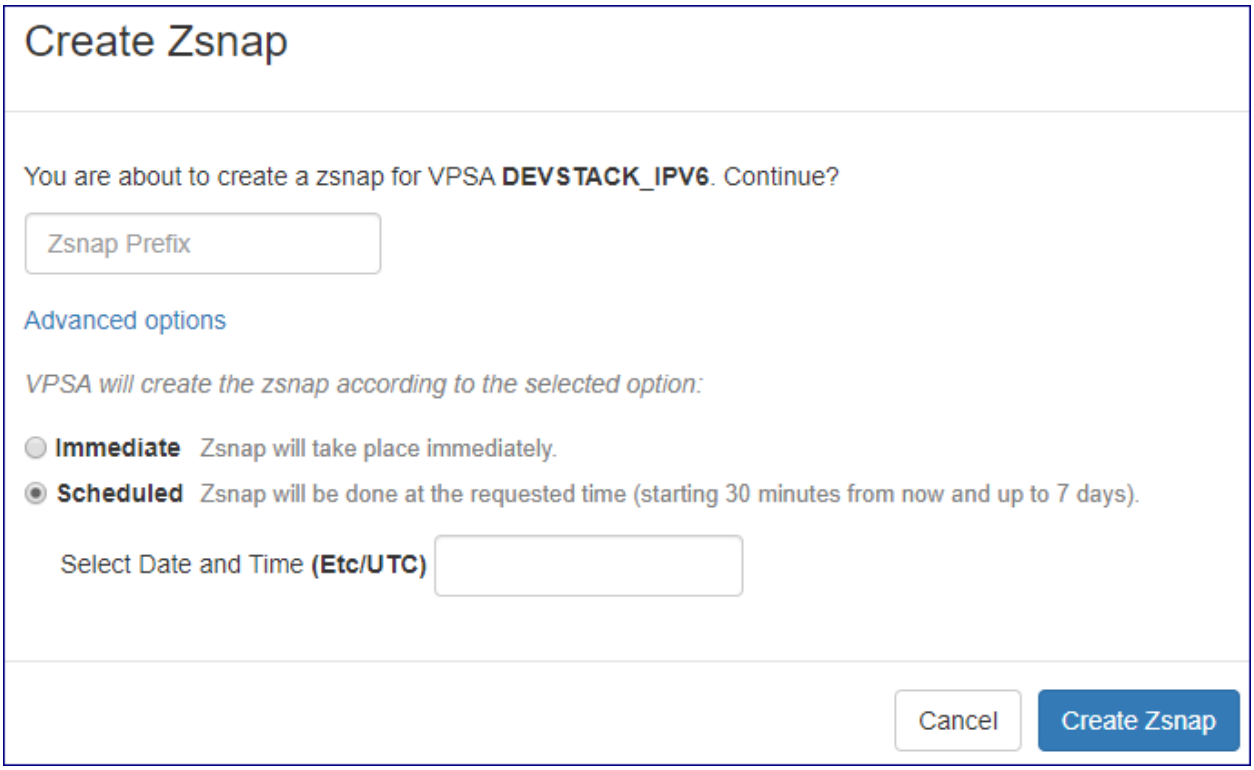
To hibernate a VPSA click the `Actions` button and select Hibernate from the dropdown. On the popup dialog that will appear Type HIBERNATE on the textbox item as required and confirm the operation by clicking on the `Hibernate` button.



The request will be submitted for processing, upon successful completion the VPSA status will change to Hibernated.

5.3.13 Creating VPSA Zsnap

To Trigger Manual creation of Zsnap for a VPSA go to its dashboard, click the `Actions` button and select Create Zsnap from the dropdown.



VPSA Zsnaps can be created immediately or scheduled. To create Zsnap immediately: On the popup dialog that will appear provide the prefix for the Zsnap and confirm creation by clicking on the `Create Zsnap` button. To schedule a Zsnap creation: On the popup dialog that will appear provide the prefix for the Zsnap and click on Advanced option. select Scheduled Zsnap and provide creation date and time. to confirm scheduling the Zsnap click on the `Create Zsnap` button.

5.3.14 Purging or restoring a deleted VPSA

Any VPSA instance that has been deleted from the cloud will remain in the clouds recycle bin for a period specified in it's settings (see Managing Cloud Settings). Cloud administrator can manually purge a deleted VPSA prior to the recycle bin retention period expiration to free cloud resources allocated by it (Physical drives). Administrator can also restore the VPSA from the recycle bin and get it up and running on the same data set it contained as it was deleted.

To purge a VPSA from the clouds recycle bin make sure the status of the VPSA is Recycle bin , click the `Actions` button then select Purge from the dropdown. Type the VPSA ID specified in the popup dialog that will appear and click on the `Purge` button to confirm the operation.

To restore a VPSA from the clouds recycle bin make sure the status of the VPSA is recycle bin , click the `Actions` button then select Restore from the dropdown. On the popup dialog that will appear click on the `Restore` button to confirm the operation. The restoration will start and the VPSA status will be modified to Lunching and reverted back to Normal as the restoration concludes.

CHAPTER

SIX

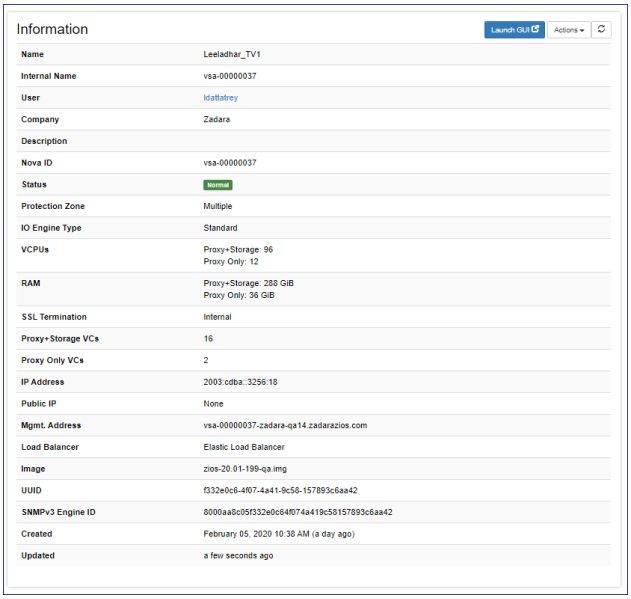
MANAGING OBJECT STORAGE VPSAS

Command center provides cloud administrators with centralized management capabilities for Zadara Cloud Object storage environment. Using command Center Cloud administrators can:

- Perform various management operations on VPSA object storage instances
- Configure Object storage availability zones resource allocation
- Monitor Object storage capacity consumption trends

6.1 Viewing Object Storage Properties

Object Storage properties/status can be viewed in the Object Storage Dashboard tab.



Property	Description
Name	Instance display name
Internal Name	internal instance name
Company	Creating user company
Description	Description given while instance was provisioned
Nova ID	Nova ID for this instance
Status	Current Instance status
Protection Zone	Instance protection zone configuration
IO Engine type	VC type for this Object storage Mini/Standard/Premium
VCPUs	VCPUs per VC type (Proxy+Storage/Proxy) for this instance
RAM	RAM per VC type (Proxy+Storage/Proxy) for this instance
SSL Termination	Where does SSL termination Occur (internal/External)
Proxy + Storage VCs	Instance Proxy + Storage VC count
Proxy Only VCs	Instance Proxy only VC count
IP Address	Instance Floating frontend IP address
Public IP	Instance public IP address
Mgmt. Address	Instance hostname for management access
Load Balancer	Instance Load balancer type (Basic\Elastic Load Balancer)
Image	Instance deployment image
UUID	Instance UUID
SNMPv3 Engine ID	Instance SNMPv3 EngineID
Created	Creation timestamp
Updated	Last update timestamp

6.2 Managing Object Storage Availability Zones

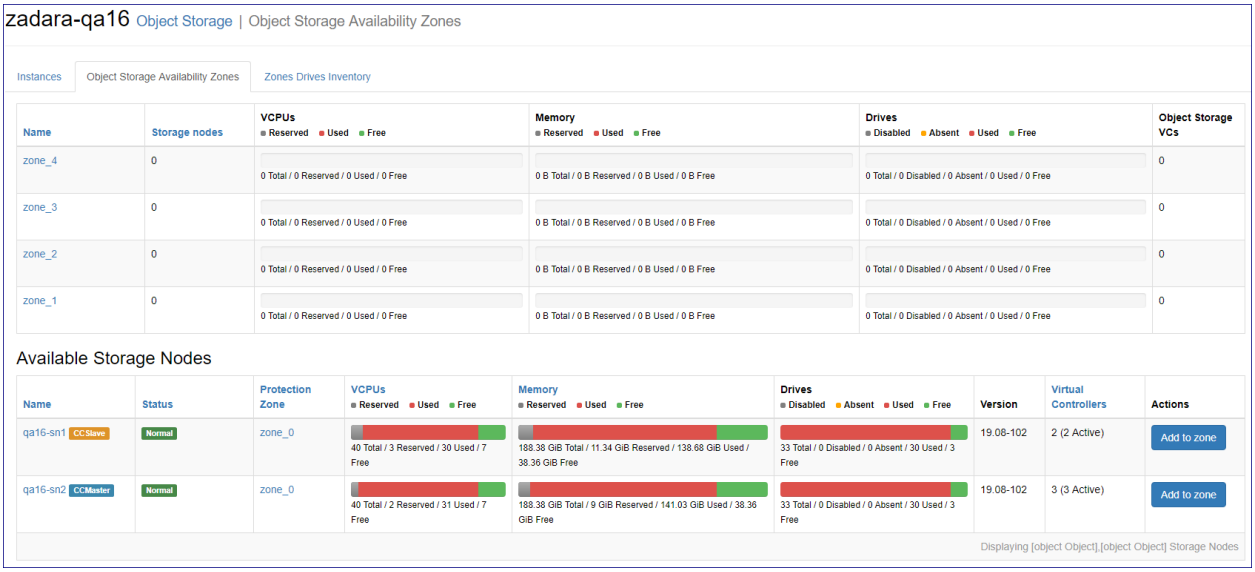
Object storage availability zones are required to support the various protection policies used in the cloud. By default there are 4 Availability zones defined in each cloud to which different storage nodes can be allocated.

Cloud administrators ability to define specific object storage protection policies is dependent on the SN to availability zone allocation scheme.

Protection Policy	Number of availability zones with SN allocated required
2-way mirroring	2
3-way mirroring	3
6+3 erasure coding	3
8+4 erasure coding	3
9+3 erasure coding	4

6.2.1 Assigning and removing Storage nodes to Object storage availability zones

To view current object storage availability zones configuration select the Object Storage tab and then on the following screen select the Object Storage Availability Zones tab. The Object Storage Availability Zones tab presents the current resource allocation scheme and amount of resources (VCPUs , Memory and Drives) is Allocated , Utilized or free in each availability Zone. On the lower part of the screen a list of available storage nodes and their resources inventory is displayed.

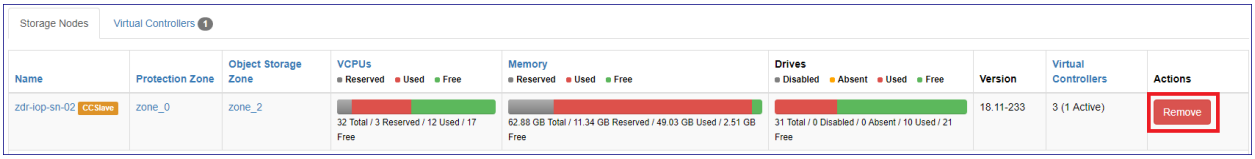


To allocate a Storage Node to an Availability zone:

- Select a storage node and click the appropriate `Add to zone` button on the right side of the screen
- On the popup dialog that appears select the required availability zone and click `add`
- The availability zone configuration will update to reflect the required changes.

To remove a Storage Node from an Availability zone:

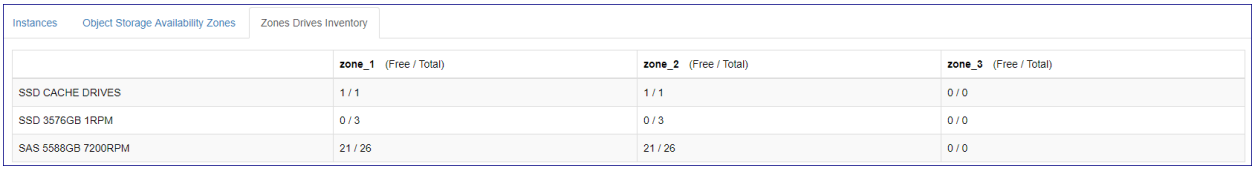
- Click on required Availability zone
- On the Storage nodes tab locate the node you wish to remove and click the `Remove` button



- On the following popup dialog confirm the removal request
- The availability zone configuration will update to reflect the required changes.

6.2.2 Viewing Object storage availability zones drive inventory

To view drive inventory click on the Zones Drives inventory tab, Inventory will be presented grouped by drive types.



6.3 Managing VPSA Object Storage Instances

6.3.1 Adding drives to VPSA object Storage

From the Instances tab on the Object Storage screen select the appropriate VPSA Object storage instance. From the specific Instance dashboard click the `Actions` button then select Add drives from the drop down menu. On the popup dialog that will appear select the required protection policy, number of drives to be added and the drive type. Click on the `Add drives` button, the request will be submitted.

✔ **Note:**

- When Adding drives to VPSA Object storage virtual controllers can also be added automatically depending on the drive to VC ratio
- In case that the VPSA Object Storage instance version is older then 20.01 - virtual controllers cannot be spawn on Storage Nodes with ConnectX-5 NICs

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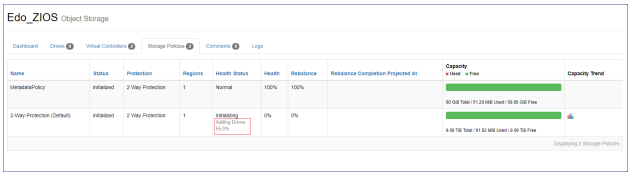
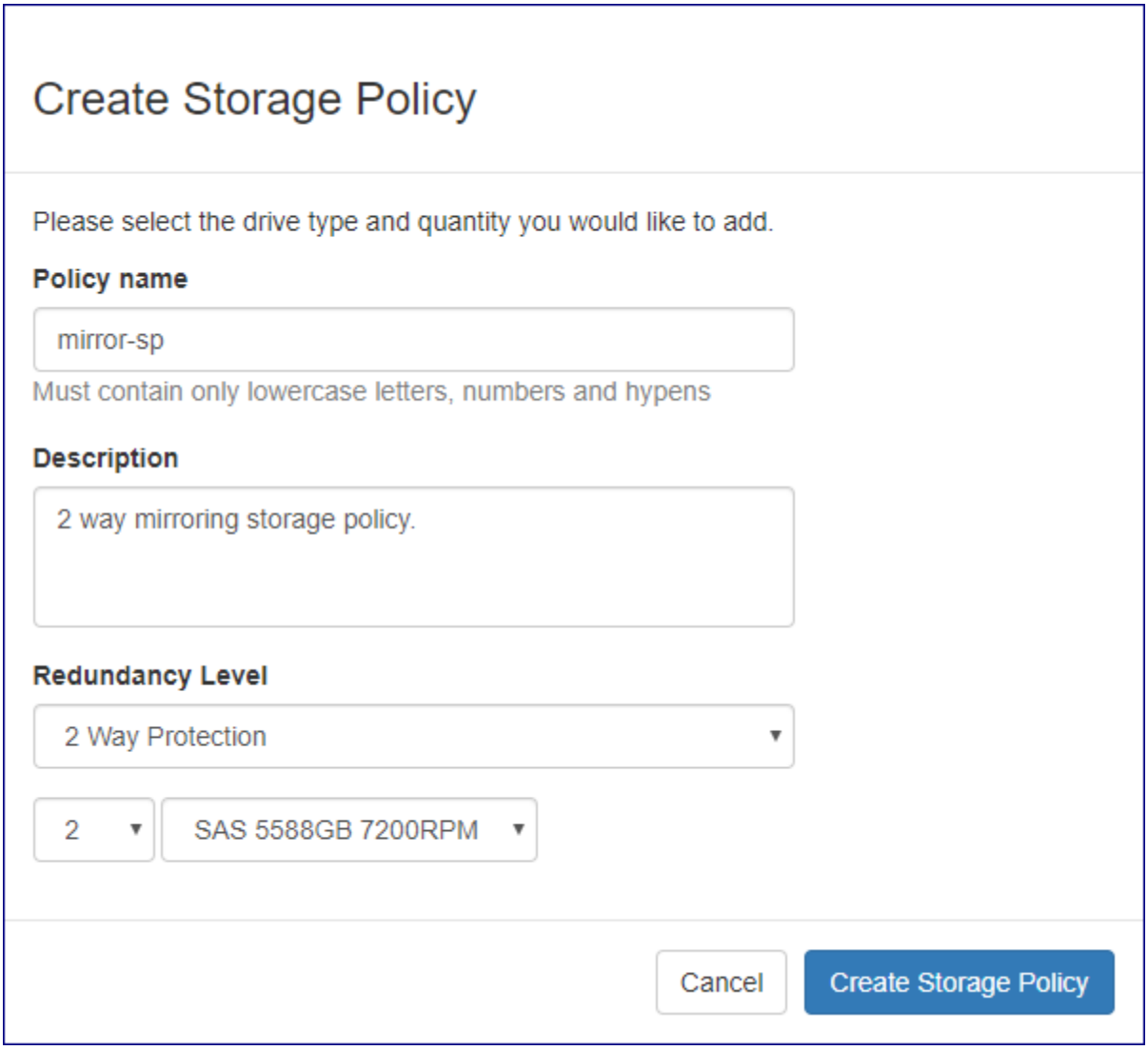
To avoid any performance impact - drive addition process is performed gradually, configuration of drive addition increments can be performed from the settings dialog in the VPSA object storage GUI. Drive addition progress can be monitored from the VPSA Object Storage Storage Policies tab in command center.



6.3.2 Creating a storage policy

From the Instances tab on the Object Storage screen select the appropriate VPSA Object storage instance. From the specific Instance dashboard click the `Actions` button then select Create Storage policy from the drop down menu.

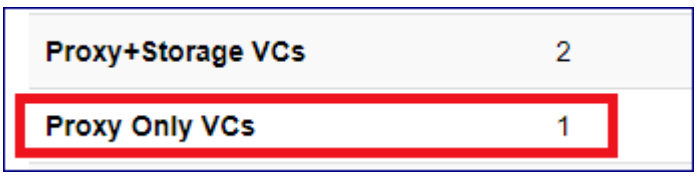
On the popup dialog that will appear select name your new storage policy and select an appropriate protection policy from the list of the cloud supported policies. Select the number of drives you wish to assign to your new policy and the drive type to use. click on the `create storage policy` button , the request will be submitted for processing.



6.3.3 Adding a proxy virtual controller

From the Instances tab on the **Object Storage** screen select the appropriate VPSA Object storage instance. From the specific Instance dashboard click the `Actions` button then select Add Proxy VC from the drop down menu.

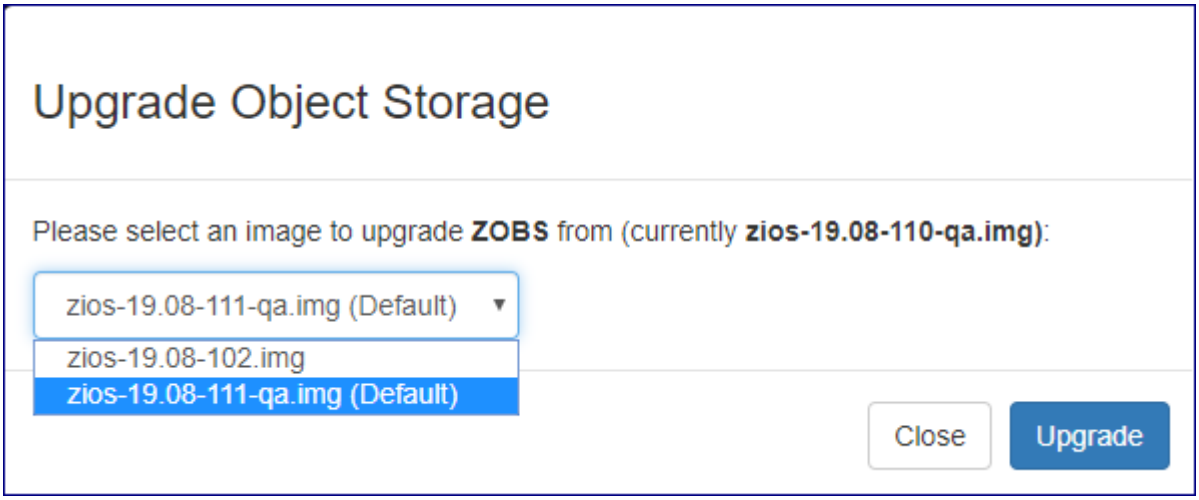
On the popup dialog that will appear confirm the operation by clicking on the `Add Proxy Virtual Controller` button. The request will be submitted for processing, after completion the proxy only VCs property on the specific VPSA Object storage dashboard will be incremented.



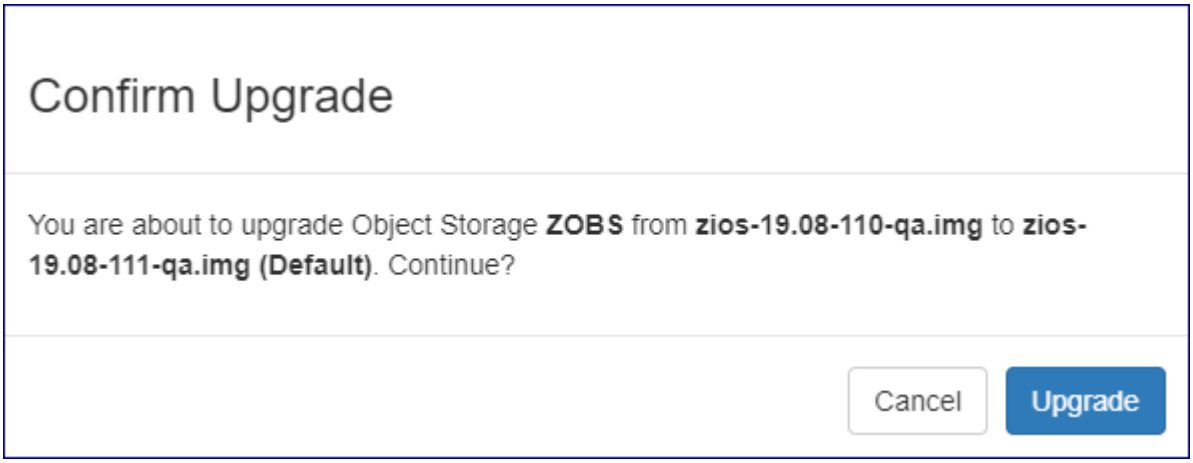
6.3.4 Upgrading VPSA Object storage

Command center allows administrators to perform version upgrade on the VPSA Object storage instances running in the cloud. to perform version upgrade select the appropriate VPSA Object storage instance from the Instances tab on the Object Storage screen. From the specific Instance dashboard click the `Actions` button then select Upgrade from the drop down menu.

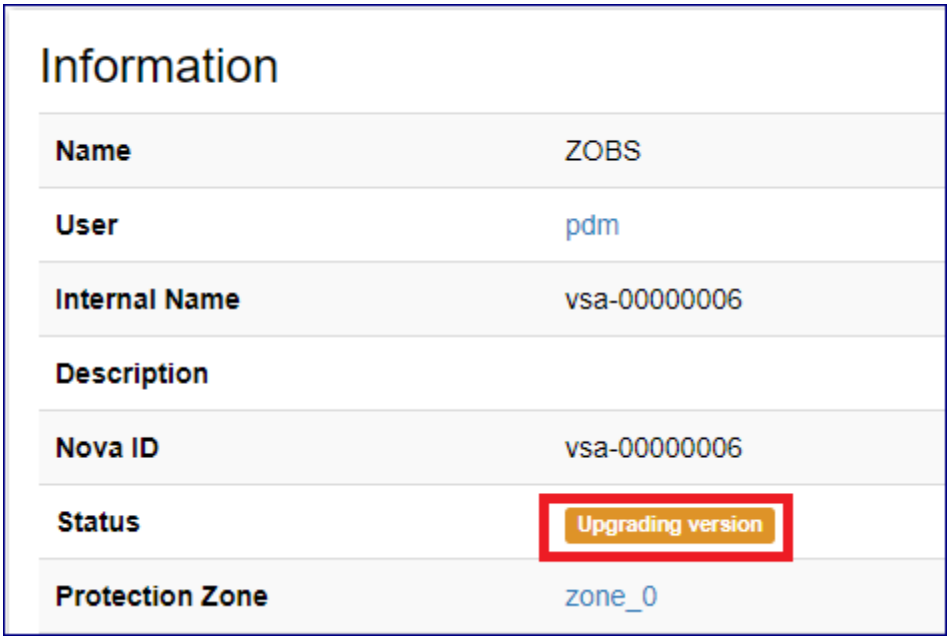
On the popup dialog that will appear select the specific image level to which h you would like to upgrade and click on the `Upgrade` button to confirm.



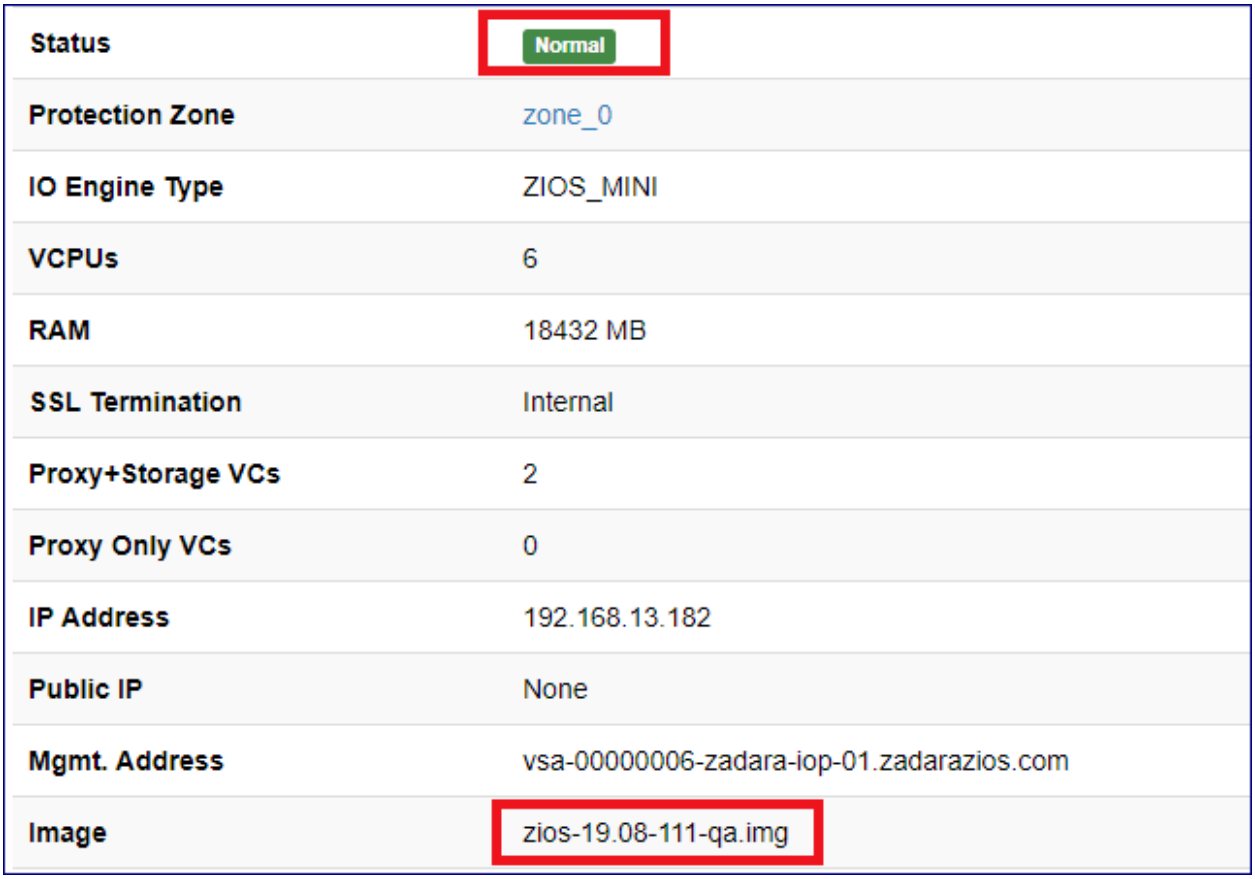
Another Pop up dialog will appear requesting confirmation for upgrading to the selected version click on the `Upgrade` button to confirm the process.



The request will be submitted and the VPSA Object storage status property will change to Upgrading version while the process is running.



When the VPSA version upgrade process is completed the status property will be changed back to normal and the image property will be updated to reflect the new VPSA version.

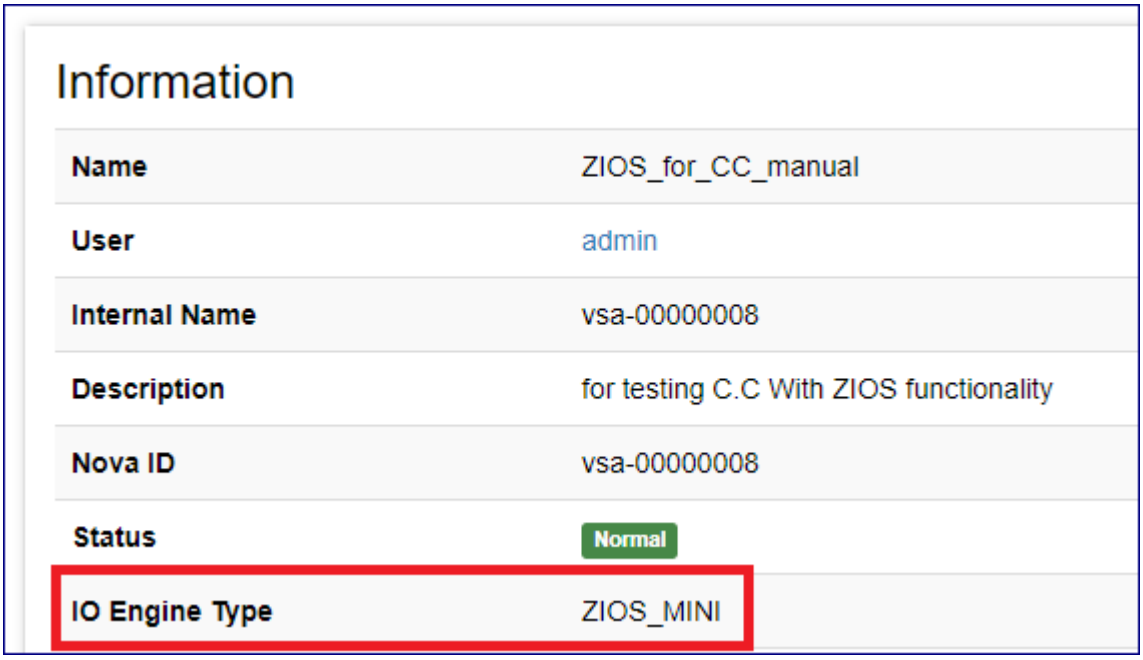


✔ Note:

- From cloud version 20.12 VPSA Object Storage upgrade to a version which more then 2 major release higher then the current version will be blocked by Command Center
- From cloud version 20.12 VPSA Object Storage version downgrade will be blocked by Command Center

6.3.5 Changing VPSA Object Storage engine type

When creating a VPSA Object storage with 4 disk drives or less the VPSAs engine type will be set to MINI which is a lower footprint engine compared to the fully blown VPSA for object storage virtual controller (designed to support up to 12 disk drives). VPSA for Object Storage MINI virtual controllers can be manually converted to the fully blown footprint by Command Center.



✔ **Note:** VPSA Object Storage engine will be automatically upgraded when more then 4 disk drives overall are provisioned to it

To change engine type go to the appropriate object storage instance and click the `Actions` button and select Change Engine Type from the drop down menu. On the popup dialog that will appear confirm the operation by clicking on the `Change engine` button. The request will be submitted for processing. After completion the IO Engine Type property on the specific VPSA Object storage dashboard will Changed to Standard.

6.3.6 Hibernate VPSA Object storage instance

VPSA Hibernation will take the instance offline and free its consumed resources (vCPU , RAM) on the Storage Nodes level. Hibernation of a VPSA will also reduce its associated service cost. For VPSA in a hibernated state only drives are billed. Hibernating a VPSA involves the process of deleting its Virtual Controllers (the VPSA) while maintaining the data drives and all the necessary metadata to resume its operation at a later stage. Resuming a hibernated VPSA only takes a few minutes.

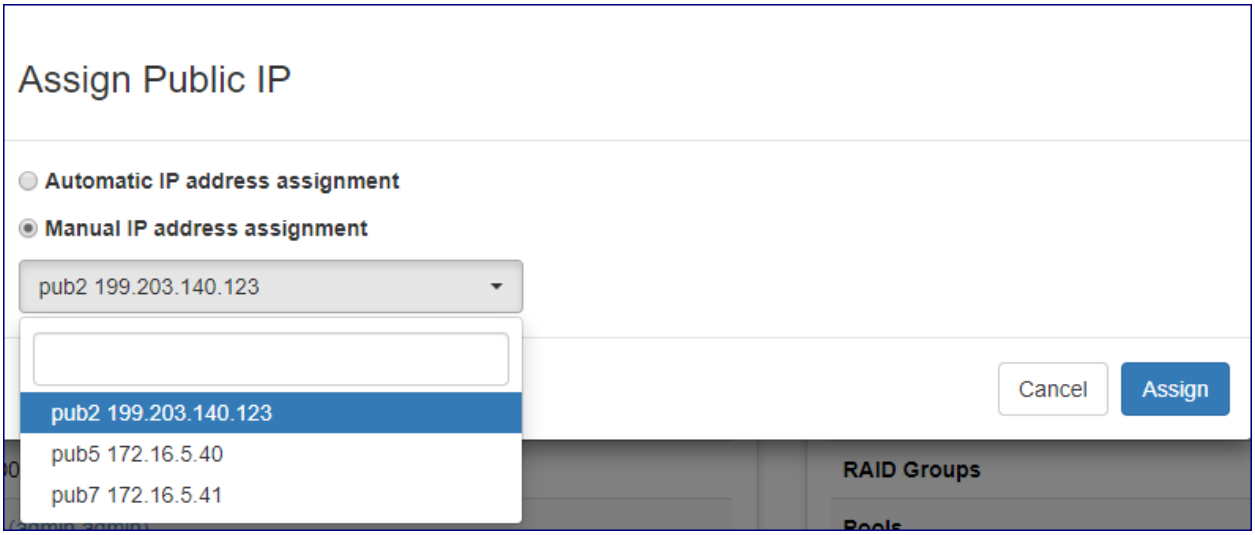
From the Instances tab on the Object Storage screen select the appropriate VPSA Object storage instance. From the specific Instance dashboard click the `Actions` button then select Hibernate from the drop down menu. On the popup

dialog that will appear confirm the operation by clicking on the `Hibernate` button. The request will be submitted for processing, upon successful completion the VPSA Object storage status will change to Hibernated.

6.3.7 Assigning a Public IP address to VPSA object Storage

In specific cases where a VPSA object storage instance needs to be available for management access from outside of his Cloud allocated VLAN, a public IP address can be assigned to it. On information regarding the definition of Cloud level public IP ranges please refer to Creating Public IP addresses in this manual.

To assign a public IP address go to the appropriate object storage instance and click the `Actions` button and select assign public IP from the drop down menu.



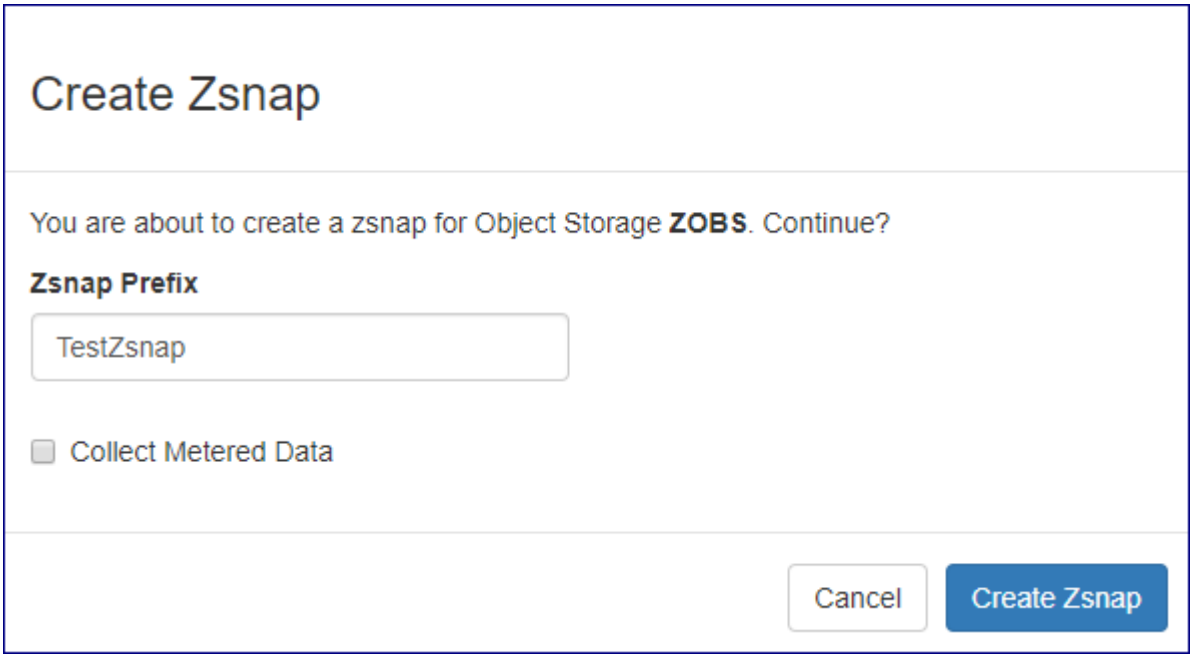
Public IP addresses can be automatically assigned from a cloud level pool or manually selected. To automatically assign a public IP address: On the popup dialog that will appear make sure Automatic IP address assignment is selected and confirm the operation by clicking on the `Confirm` button. To manually select a specific public IP address: On the popup dialog that will appear select Manual IP address assignment, select the required public IP and confirm the operation by clicking on the `Confirm` button.

✔ Note:

- Manual public IP assignment is only available for VPSA object storage instances in version 20.01 and above
- Public IP is not supported for VPSA object storage instances with IPV6 frontend address

6.3.8 Creating VPSA Object Storage Zsnap

To Trigger Manual creation of Zsnap for the VPSA Object storage go the its dashboard, click the `Actions` button and select Create Zsnap from the drop down menu. On the popup dialog that will appear provide the prefix for the Zsnap and confirm weather you would like to include the VPSA Object storage metering data. Confirm the Zsnap creation by clicking on the `Create Zsnap` button.


Create Zsnap
You are about to create a zsnap for Object Storage ZOBS. Continue?
Zsnap Prefix
TestZsnap
Collect Metered Data
Cancel
Create Zsnap

CHAPTER

SEVEN

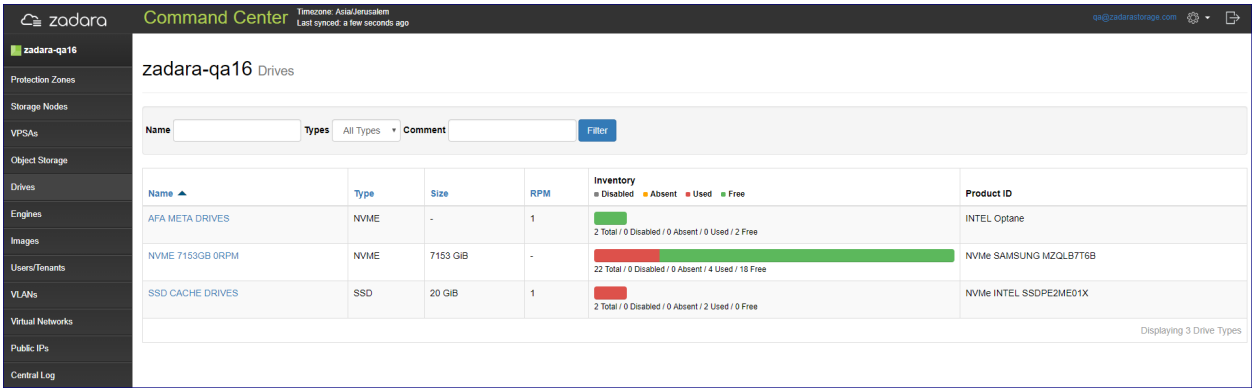
MANAGING PHYSICAL DRIVES

Command center provides extensive cloud physical drive management functionality.
Using Command Center Zadara Cloud administrator can easily perform activities such as :

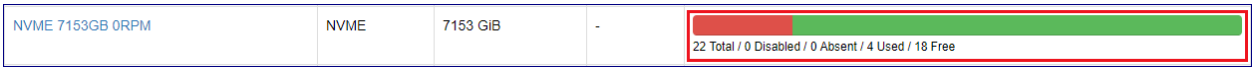
- Drive inventory management
- Drive validation and failure management
- Assignment of drives to specific roles

7.1 Viewing Physical Drive Inventory

Command center displays overall drive inventory under the `Drives` tab.



Drive inventory is primarily divided by drive model and displays detailed utilization per each group.



Status	Description
Total	Number of drives from the specific model available in this cloud
Disabled	Drives that were set to disabled by the cloud admin
Absent	Drives that are physically unavailable (taken out of their bay)
Used	Drives which are actively assigned to a VPSA instance
Free	Drives not assigned to any VPSA instance

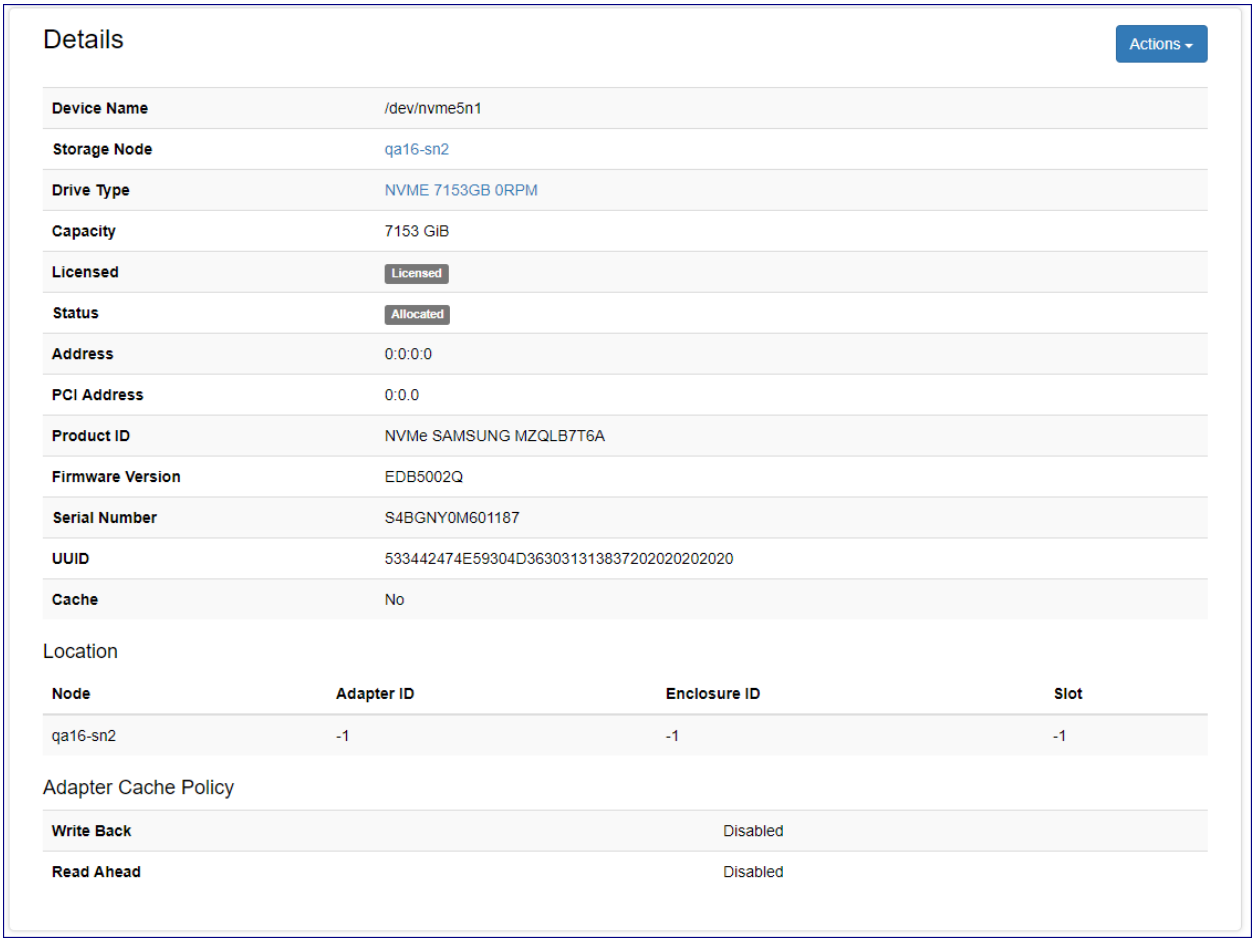
✔ Note:

Drive inventory assigned to a specific VPSA, deployed on a specific protection zone
or installed on a specific Storage node can be also viewed from the corresponding VPSA/SN/Protection Zone

7.2 Viewing Drive Properties

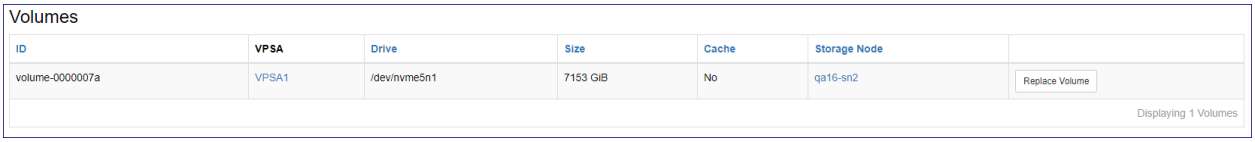
From the Command center `drives` tab select the drive group to which the required drive belong a after list of group members appear select the required drive.

Drive Properties



property	Description
Device name	Device file identifier for this drive
Drive Type	Drive model
Capacity	Physical capacity(Gib) of the drive. **Note:** SSD cache drives will also present capacity of allocated partitions
License	Indicates whether this drive is licensed on the cloud level
Status	Indicates the current status of the drive(Ex: allocated)
Address	SN SCSI address for the specified Drive
PCI Address	SN PCI address for the specified Drive
Address	SN SCSI address for the specified Drive
PCI Address	SN PCI address for the specified Drive
Product ID	Product Id for the specific drive
Firmware version	Specified Drive Firmware Version
Serial Number	Serial Number of this drive
UUID	Linux UUID for the SN Device
Cache	weather this drive is being used as SSD cache
Location	SN and MegaRaid location identifier for this drive (Adapter IDEnclosure IDSlot)
Adapter cache policy	MegaRaid Adapter cache policy(Writeback - adapter write buffering Readahead - adapter read prefetching)

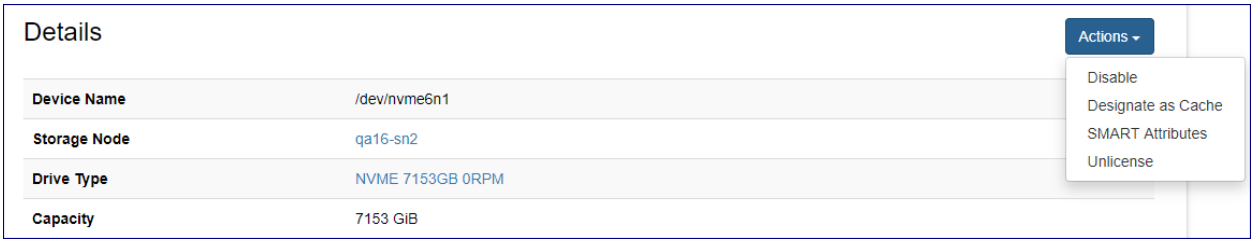
Volume Properties



property	Description
ID	Volume Identifier
VPSA	VPSA/Object Storage to which this volume is allocated
Drive	Device file name for the SN physical drive
Size	Volume Capacity
cache	Weather this volume is used as GEN2 SSD cache device
Storage Node	SN in which this volume is defined
Replace Volume	Toggle drive replacement for this volume

7.3 Performing Operations On Physical Drives

To view all operations that can be performed on a specific drive: From the `Drives` tab select the appropriate drive group and go to the drives tab. Select the required physical drive and click on the `Actions` button.



Disabling a drive

From the actions drop down menu select `Disable` a pop up confirmation window will appear in which select Disable. After operation the will complete the drive status will be changed to Disabled.

Enabling a drive

Select a disabled physical drive. From the actions drop down menu select Enable and confirm the operation in the pop up dialog that will appear. After the operation will complete the drive status will be changed to Enabled.

Managing drive LED

A Physical drive LED can be turned on\off from Command center. To manage a physical drive LED select LED On or LED Off from the actions drop down menu and confirm the operation in the pop up dialog.

Viewing drive SMART attributes

From the actions drop down menu select SMART Attributes. A pop up windows will appear displaying SMART Attributes for the specific drive.

Designating SSD drive as Cache

SSD drives installed within the cloud can be designated as cache drives that will be used in hybrid VPSA configurations.

✔ **Note:**

Available capacity from an SSD drive designated as cache cannot be allocated as user data to VPSA images.

From the actions drop down menu select Designate as cache. A pop up windows will appear displaying warning information and requesting action confirmation. After confirmation drive type will be changed to SSD CACHE DRIVES.

Removing drives

Cloud administrator can initiate an orderly removal of physical Drives from the cloud via Command Center. To start the removal process select Offline and remove from the drive actions drop down menu.

Unlicensing a drive

From the actions drop down menu select Unlicense. A pop up windows will appear displaying warning information and requesting action confirmation. After confirmation drive type will be changed to Unlicensed.

7.4 Monitoring Drive Performance

To view performance statistics for a specific drive: From the Drives tab select the appropriate drive group and go to the drives tab. Select the required physical drive and go to the Performance tab. Performance statistics displayed per physical drive include :

- Average IO rate divided in to read vs. write IOs
- Average IO time divided in to read vs. write IOs
- Average Bandwidth divided in to read vs. write activity

Monitoring interval can be changed supported intervals are : 1sec ,10sec, 1min, 1hr and 1day. Interactively refreshed charts can be triggered by pushing the `Auto refresh` button.

CHAPTER

EIGHT

VIEWING ENGINE PROPERTIES

Command Center allows cloud administrator to view all Virtual Private Storage Array engine types available for deployment on the cloud. To view VPSA engine properties navigate to Command Center Engines section from the left menu pane.

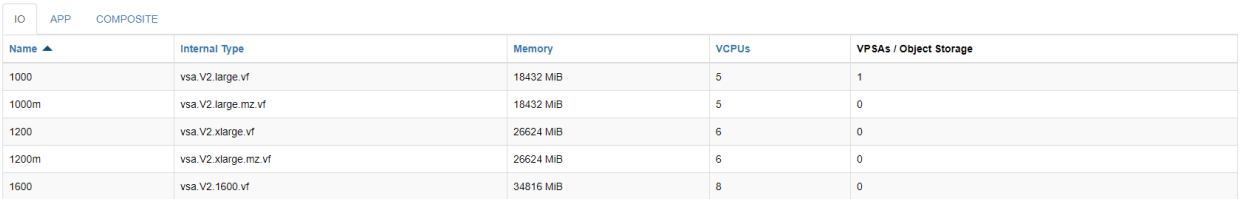
The VPSA engine types presented in this section are:

- VPSA IO engines
- VPSA app engines
- VPSA composite engines

Toggling between the engine types is done via the tabs section in the top part of the dialog”

8.1 VPSA IO engines properties

For VPSA IO engines the following properties are presented:



Name	Internal Type	Memory	VCPUs	VPSAs / Object Storage
1000	vsa.V2.large.vf	18432 MiB	5	1
1000m	vsa.V2.large.mz.vf	18432 MiB	5	0
1200	vsa.V2.xlarge.vf	26624 MiB	6	0
1200m	vsa.V2.xlarge.mz.vf	26624 MiB	6	0
1600	vsa.V2.1600.vf	34816 MiB	8	0

property	Description
Name	IO Engine Name
Internal Type	internal type used by Nova for this engine
Memory	**Single virtual controller** RAM requirement for this IO engine
VCPU	**Single virtual controller** VCPUs requirement for this IO engine
VPSAs / Object Storage	Count of VPSAs in this cloud with this engine type

8.2 VPSA APP engines properties

For VPSA APP engines the following properties are presented:

IO APP COMPOSITE

Name	Internal Type	Memory ▲	VCPUs	VPSAs
00	None	0 MiB	0	8
01	tiny	256 MiB	1	0
02	small	512 MiB	1	0
04	medium	1024 MiB	2	0
06	large	2048 MiB	3	0
08	xlarge	4096 MiB	4	0

Displaying 6 App Engine Types

property	Description
Name	APP Engine Name
Internal Type	internal type used by Nova for this engine
Memory	RAM requirement for this APP engine
VCPU	VCPUs requirement for this APP engine
VPSAs / Object Storage	Count of VPSAs in this cloud with this APP engine type allocated to them

8.3 VPSA composite engines properties

For VPSA composite engines the following properties are presented:

IO APP COMPOSITE

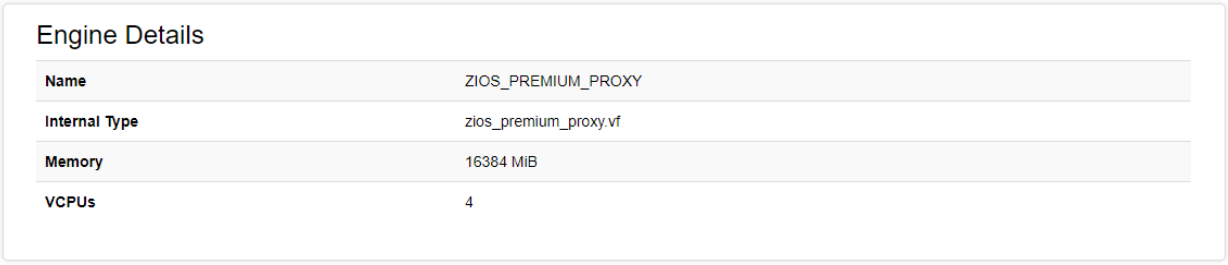
Property ▲	PREMIUM_PLUS	PREMIUM	STANDARD
Category	zios	zios	zios
Controller Instance Type	zios_premium_ctrler.vf	zios_premium_ctrler.vf	zios.vf
Data Policy Partition Power	18	15	14
Dedicated Controller Vcs	1	1	
Enable Zelb On Zios Creation	1		
Enforce Drive Add With VC Set	1	0	
Max Capacity In TB	61440	4096	1024
Max Drives Per Proxy Storage VC	12	12	12
Metadata Partition Size In GB	200	200	120
Metadata Partitions Per Proxystorage VC	1	1	
Metadata Policy Partition Power	14	12	12
Minimum VC Sets During Zios Creation	2	1	
Name	premium_plus	premium	standard
Proxy Instance Type	zios_premium_proxy.vf	zios_premium_proxy.vf	zios.vf
Proxy Storage Instance Type	zios_premium_proxystorage.vf	zios_premium_proxystorage.vf	zios.vf
Setup Partition Size In GB	60	60	10

Displaying 3 Composite Instance Types

property	Description
Type	Composite engine type
Controller Instance Type	link to image used for composite controller instances
Data Policy Partition Power	Swift partition power used for data policies for this composite engine type
Dedicated Controller Vcs	count of dedicated controller VCs deployed for this composite engine type
Enable ZELB On Object Storage Creation	Wether Zadara Extend load balancing will be enabled on VPSA creation
Enforce Drive Add With VC Set	Wether disk drives are automatically added when the VPSA is expanded by additional vc set
Max Capacity In TB	Maximum storage capacity supported by this composite engine type
Max Drives Per Proxy Storage VC	maximum disk drives that can be added to a proxy storage virtual controller
Metadata Partition Size In GB	Size in gigabytes of each Metadata partition
Metadata Partitions Per Proxystorage VC	Metadata partitions allocated for each proxy storage virtual controller
Metadata Policy Partition Power	Swift partition power used for metadata policies for this composite engine type
Minimum VC Sets for Object Storage Creation	Minimum footprint in terms of virtual controller sets for this composite engine type
Name	Composite engine instance type name
Proxy Instance Type	Link to image used for composite proxy instances
Proxy Storage Instance Type	Link to image used for composite storage proxy instances
Setup Partition Size In GB	Allocation size in gigabytes for the composite instance setup partition

✔ **Note:**

A composite engine instance sub-instances properties can be displayed by clicking on the sub-instance image link.



CHAPTER

NINE

MANAGING CLOUD NETWORKING

9.1 Background

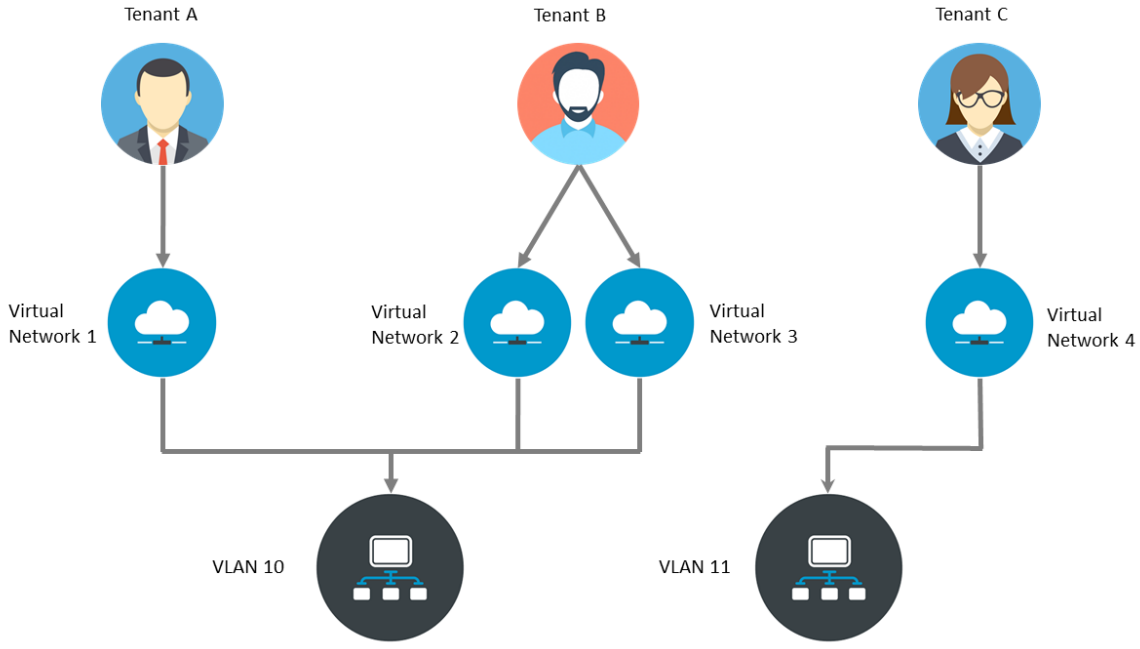
The Zadara cloud is a flexible storage cloud supporting multiple topologies, a vast range of use cases and cloud hosted environments. Due to the Zadara cloud flexibility it requires a flexible and dynamic virtual networking infrastructure that can be tailored to meet any customer demand and configuration while also enabling Zadara's managed services architecture.

The Zadara cloud networking architecture enables allocation of virtual networks to Cloud tenants (which are a representation of a cloud user and a referring provider) and interconnecting between virtual networks and networks external to the Zadara cloud using technologies such as IP routing and 802.1q VLAN tagging.

There are 2 distinct virtual networking elements managed within the Zadara Cloud:

- Virtual Local area networks(VLANs): Supported VLAN ID range per for the Zadara cloud is specified at installation. Specific VLAN IDs can be allocated to one or more cloud tenants.
- Virtual networks : Defines a set of available IP addresses within a specific network segment. Virtual networks are allocated for a specific cloud tenant and within a specific VLAN.

The below diagram depicts the relationship between cloud tenants, virtual networks and VLANs:

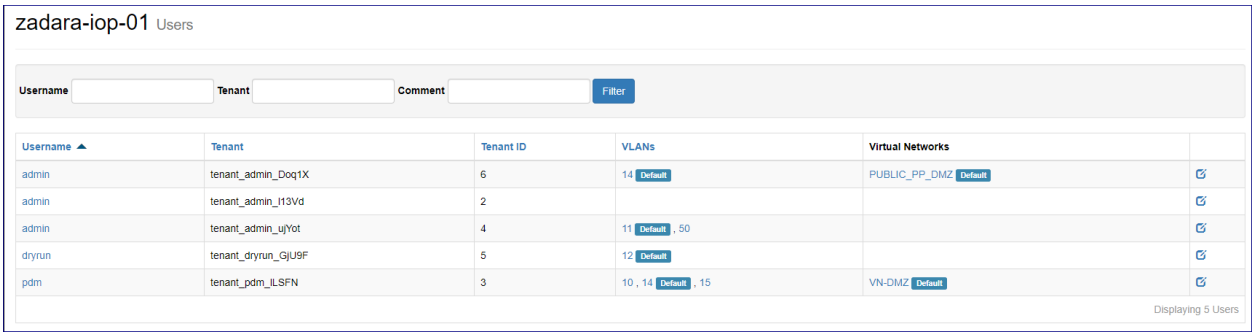


Command center provides a single point of management in which cloud administrator can define virtual networking configuration allocate networking resources to tenants.

9.2 Performing Cloud Networking Management

Viewing tenant configuration

To view configuration for a specific Tenants from Command center click on Users/Tenants on the right menu pane.



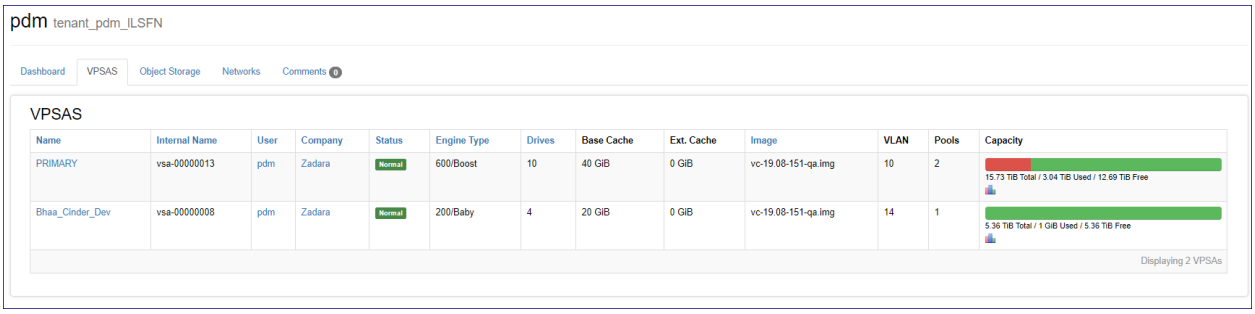
The tenants dialog provides basic configuration details for all tenants defined in the cloud. The main tenant table display the following details:

- Cloud user name
- Cloud tenant name
- Tenant id
- VLNAS which have allocation per each tenant
- Virtual networks defined in each tenant

Note:

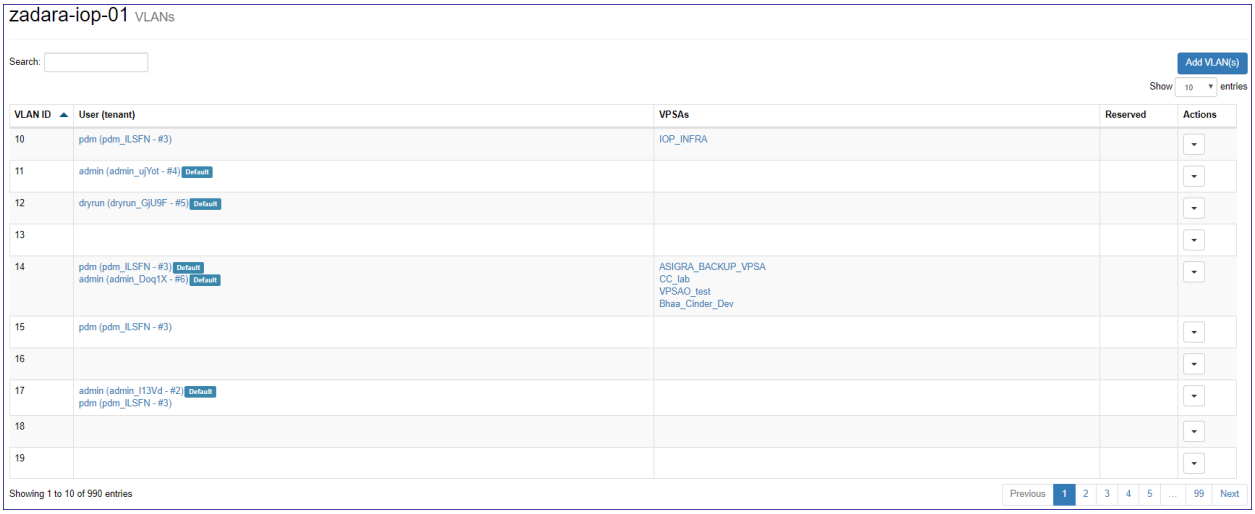
Tenant names and ids are unique per cloud but a user can have multiple tenants due to the fact a user can create tenant entries from both the local provisioning portal and a public provisioning Portal running in a PaaS environment(Heroku)

Clicking on a specific tenant record displays a drilled down view of the tenants configuration and allocated assets such as VPSA/VPSA Object storage instances and allocated virtual network details.



Viewing VLAN configuration

To view VLAN configuration from Command center click on VLANs from the right menu pane.



The VLAN configuration screen displays a list of ALL VLAN IDs specified as the cloud available VLAN range while per VLANS that have been assigned to a specific tenant Tenant and allocated VPSA/VPSA Object storage information is also displayed.

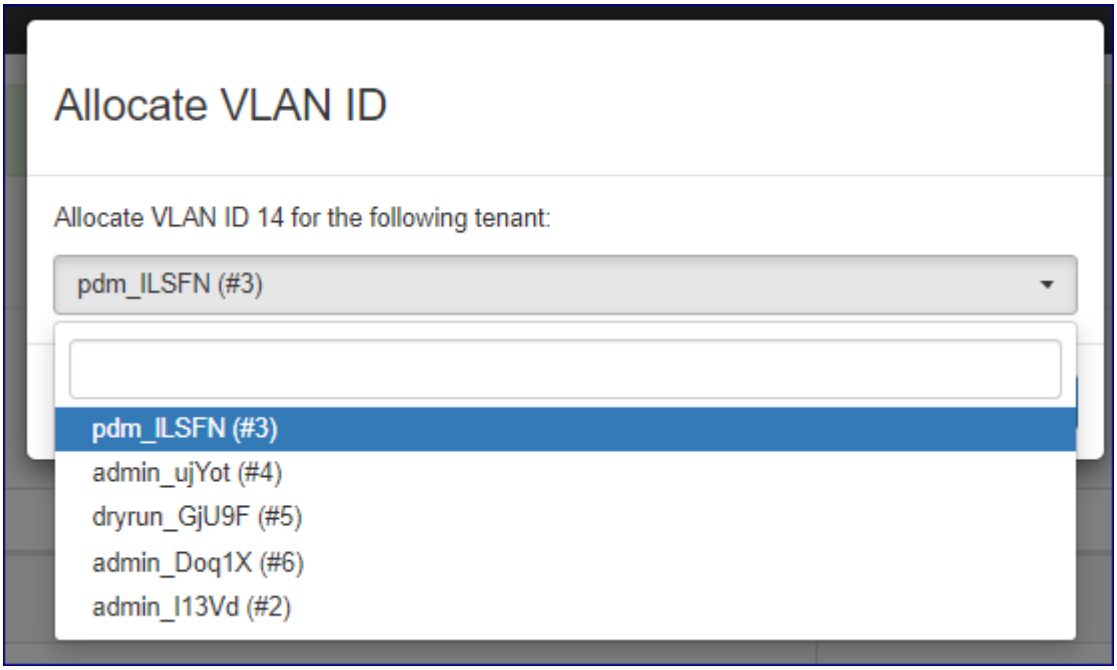
Expanding cloud addressable VLAN range

To add additional VLANS to the addressable range specified in the initial cloud configuration navigate the VLAN properties screen and click on the `Add VLAN(S)` button.

Specify an additional VLAN range that is not overlapping the currently defined range and click the `Add VLAN(S)` button the confirm expansion.

Assigning and unsinging VLANS

To assign a VLAN to a cloud tenant navigate the VLAN properties screen, locate the required VLAN id, click on its corresponding downward arrow button on the left side button and select Allocate.

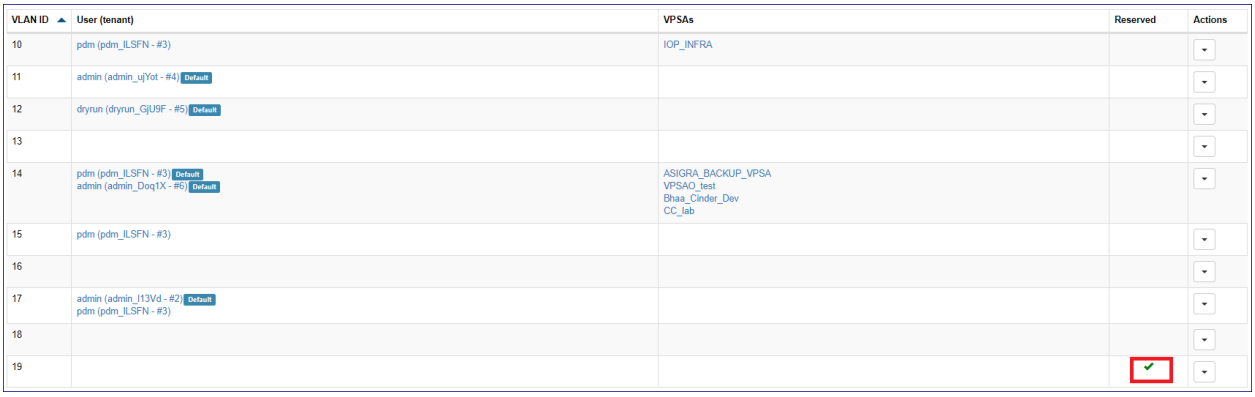


On the popup dialog that will appear select the tenant to which you would list to allocate this VLAN and click on the `Allocate` button to confirm.

To remove a VLAN from a cloud tenant navigate the VLAN properties screen, locate the required VLAN ID, click on its corresponding downward arrow button on the left side button and select Deallocate. On the popup dialog that will appear select the tenant to which you would list to allocate this VLAN and click on the `Deallocate` button to confirm.

Reserving VLANS

VLAN IDs can be reserved by command center to protect them from being allocated to tenants, reserved VLANs can be identified by a green check sign on the VLAN properties screen.



To reserve a VLAN ID navigate the VLAN properties screen, locate the required VLAN id, click on its corresponding downward arrow button on the left side button and select Reserve.

To release a VLAN ID from reservation navigate the VLAN properties screen, locate the required VLAN id, click on its corresponding downward arrow button on the left side button and select Unreserve.

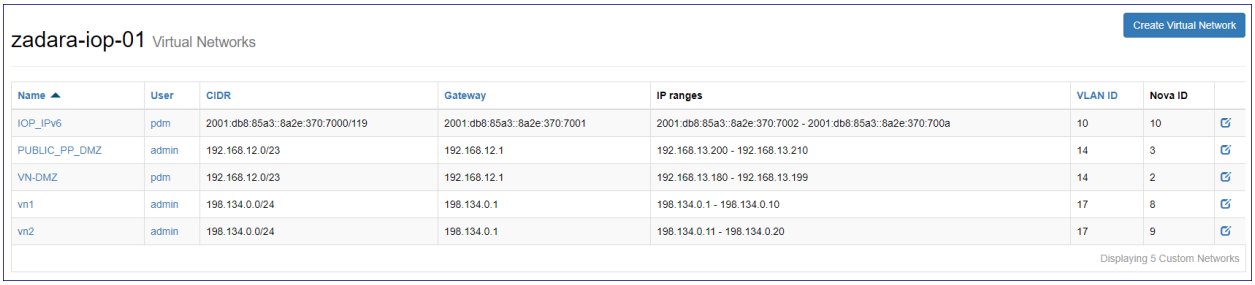
Setting a VLAN as default

Per each tenant one VLAN can be set as its default VLAN, default VLAN is the one that will be allocated for newly created VPSA\VPSA Object storage instances. To set a VLAN as default navigate the VLAN properties screen, locate the required VLAN id, click on its corresponding downward arrow button on the left side button and select Set As default. On the popup

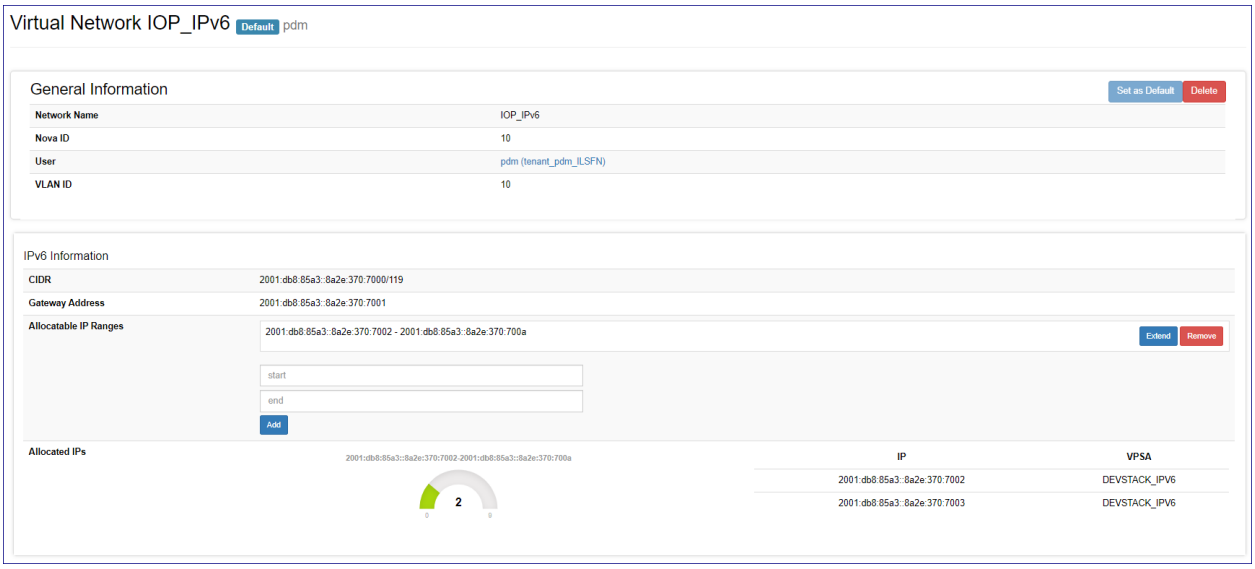
dialog that will appear select the tenant for which this VLAN will be set as default and click on the `Set as default` button to confirm the operation.

Viewing virtual networks configuration

To view the configuration of one or more virtual networks from Command center click on Virtual Networks on the right menu pane.



To drill down into a specific virtual network configuration click on its name.

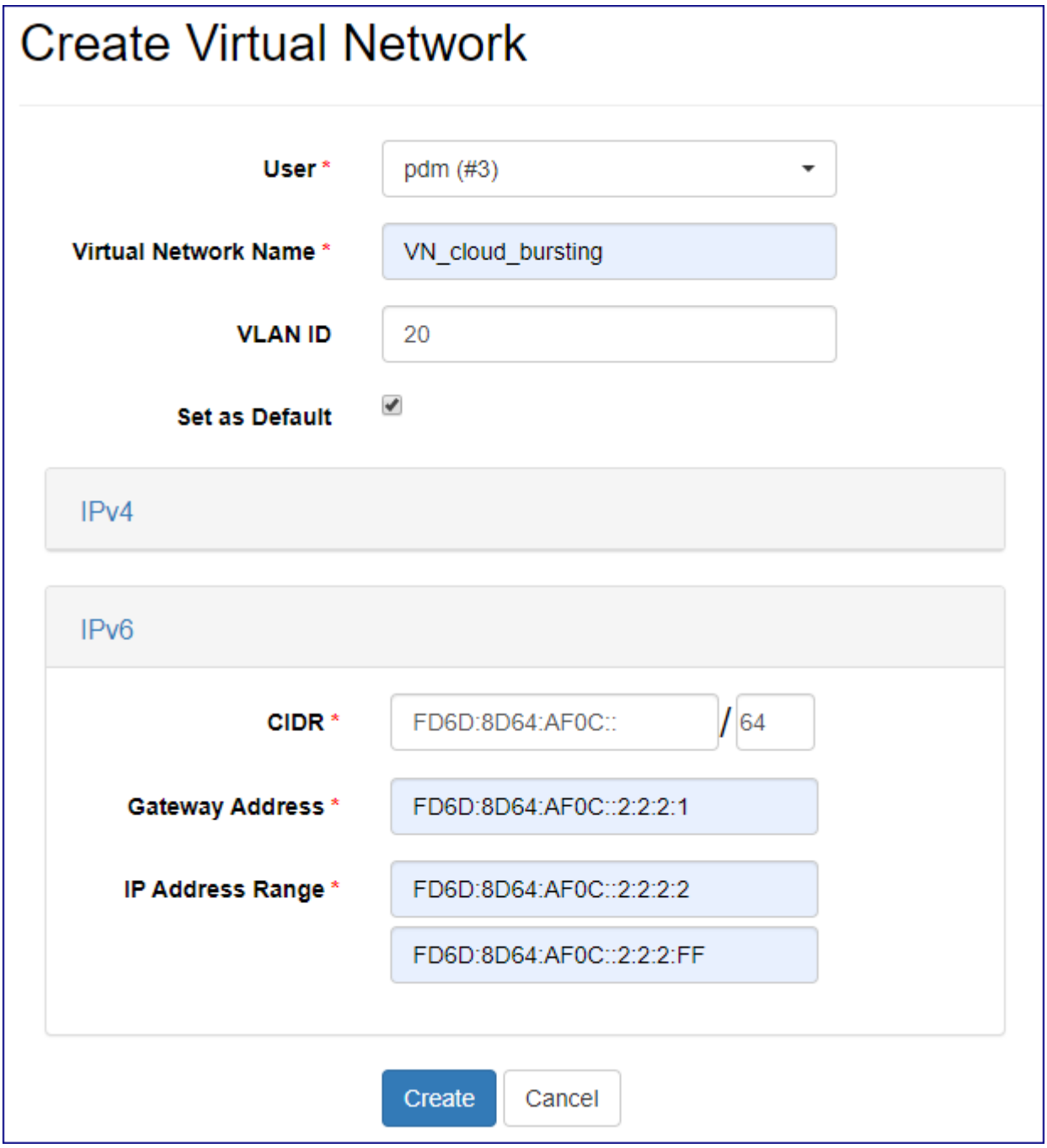


The virtual network configuration screens displays information on the network configuration such as:

- User and tenant to which this network is allocated
- Virtual Network internet protocol(IP) version (IPv4/IPv6)
- CIDR
- Default gateway
- Virtual network IP address range
- IP address allocation for VPSA and VPSA object storage entities

Creating a virtual network

To create a new virtual network from Command center click on Virtual Networks on the right menu pane and then click on the `Create Virtual Network` button.



On the virtual network creation dialog specify:

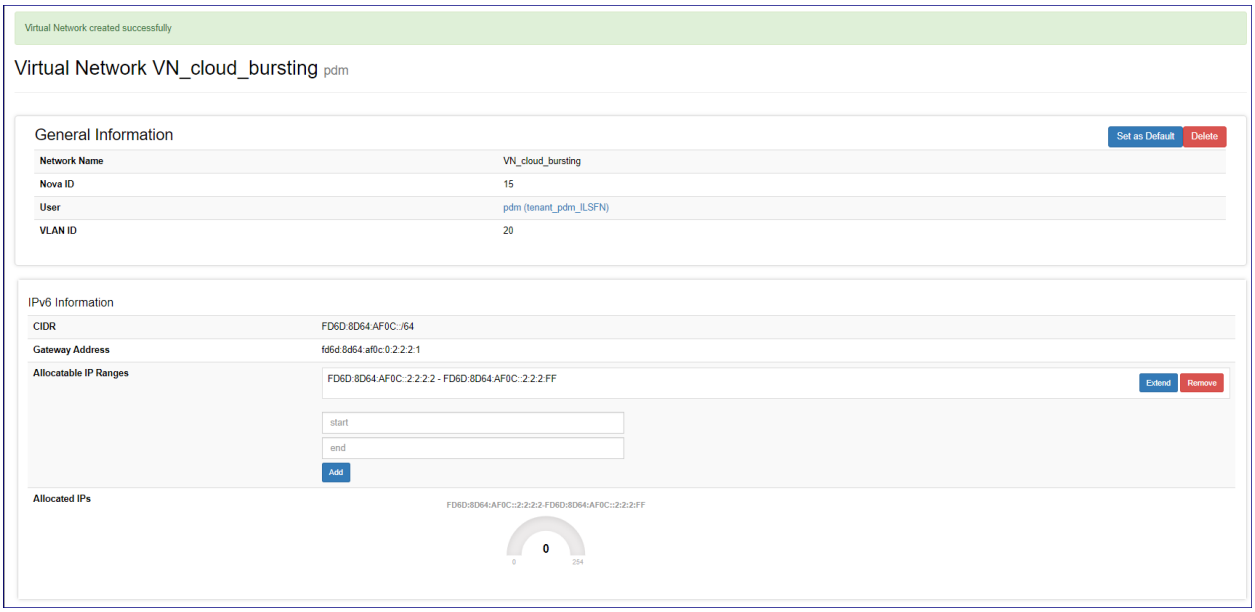
- The owning user name and tenant id (tenant id can be verified in the Users/Tenants screen).
- The new virtual network name
- Internet protocol(IP) version (define IPv4 or IPv6 Virtual Network)
- Network CIDR
- Default gateway
- IP address range allocated for this virtual network

- VLAN ID in which this virtual network will be allocated (if VLAN ID is left blank it will be automatically selected)
- Weather you would like to set this virtual network as the default network for this Tenant (each VPSA\VPSA object storage created by this tenant will attempt to allocate a front-end IP address from this virtual network).

Note:

When creating virtual networks on a multi-zone cloud you will be able to specificy a gateway address for each protection zone

Click on the `Create` button to confirm the virtual network creation



Note:

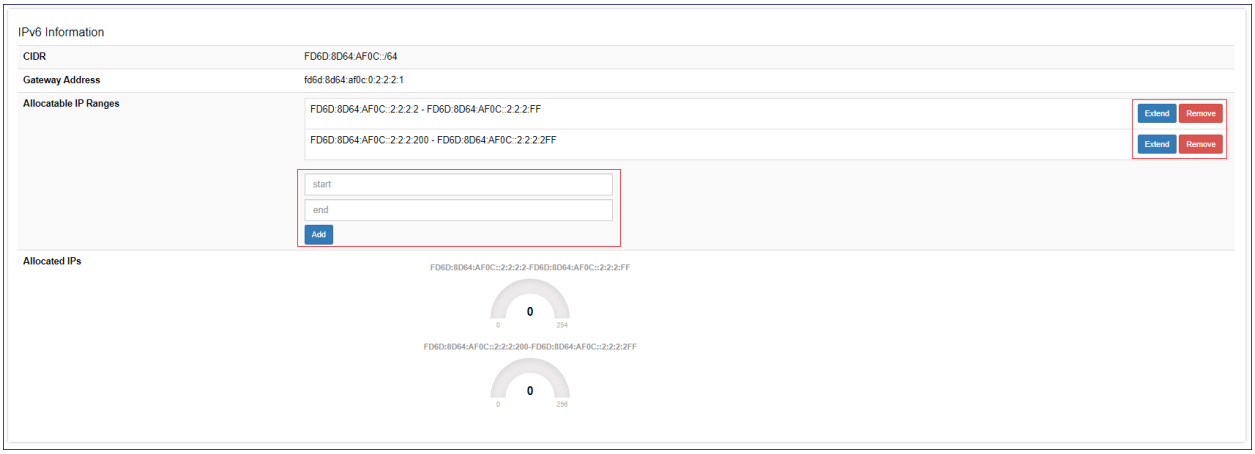
Multiple virtual networks can be defined in the same VLAN

Expanding/Shrinking a virtual network IP range

A virtual network IP range can be expanded in 2 ways:

- Addition of another IP range within the specified subnet.
- Expansion of an existing IP range with contiguous IP addresses.

To add a new IP address range : to go to the specific virtual network configuration screen, specify the new IP range in the Allocatable IP Ranges section and click on the `Add` button.



To extend an existing IP address range : click on the **Extend** button in the Allocatable IP Ranges section, specify the new upper limit for the virtual network IP range and click the **Extend** button.

To remove an existing IP address range from a virtual network : click on the **Remove** button in the Allocatable IP Ranges section, on the popup dialog that will appear click the **Confirm** button for removal confirmation.

Setting a virtual network as default

Per each tenant one Virtual network can be set as its default virtual network, default network is the one from which IP addresses will be allocated for newly created VPSA\VPSA Object storage instances. To set a virtual network as the default network to go to the specific virtual network configuration screen and click the **Set As default** button. the setting will be immediately applied and reflected in the virtual network\tenant configuration.

Deleting a virtual network

To delete a virtual network it must be unutilized(without any IP address allocations to VPSA/VPSA object storage instances). To perform deletion to go to the specific virtual network configuration screen and click the **Delete** button. On the popup dialog that will appear confirm deletion by clicking on the **Delete** button.

CHAPTER

TEN

CREATING PUBLIC IP ADDRESSES

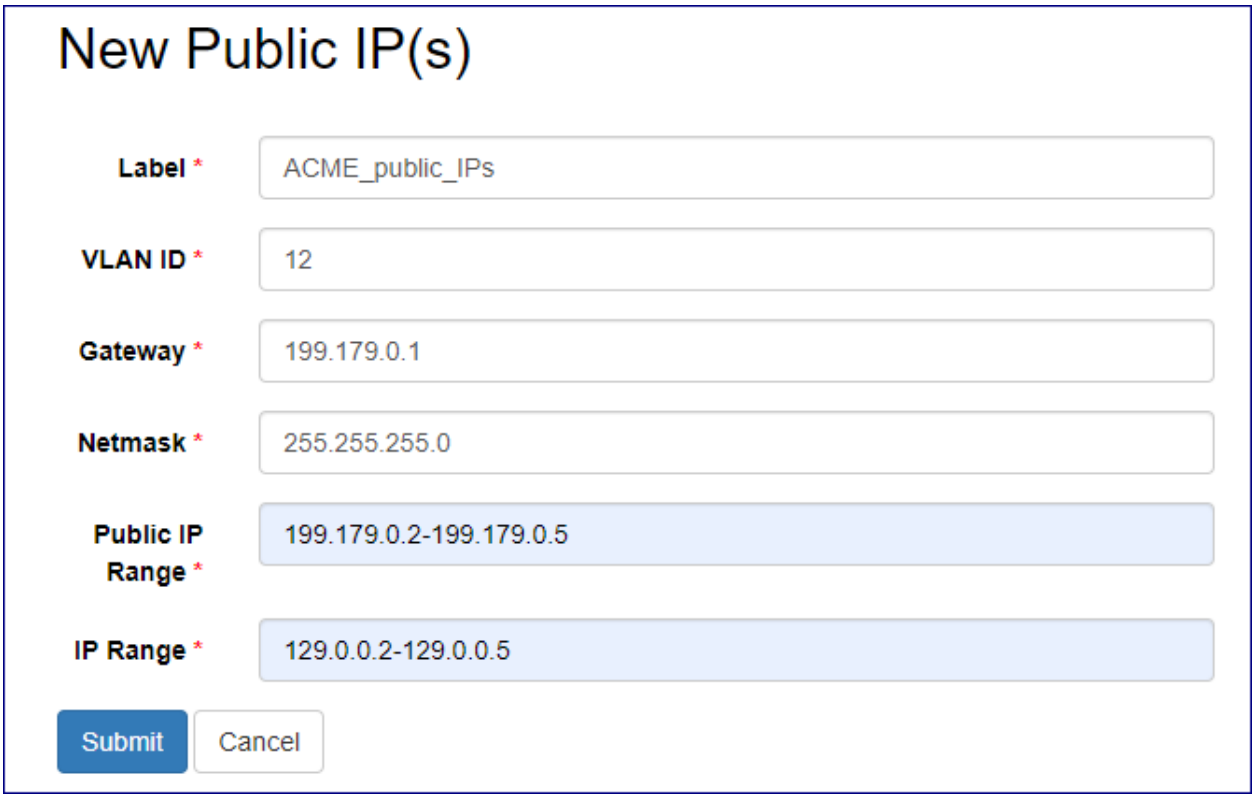
By default you access to VPSA instances from the public Internet is not available for security and privacy reasons. The VPSA Front-End IP address which is used for VPSA management (via GUI and REST API) and for data IO workload (host connectivity via iSCSI/NFS/SMB protocols), is allocated on the Zadara Storage Cloud "Front-End" network which is routable only from the Cloud Servers network. Servers outside of the Cloud Servers network cannot reach this IP address.

Public IP addresses are allocated on the Cloud management interface and can be assigned to VPSA instances to enable management access to it from outside of the cloud network.

A typical use case requiring Public IP addresses is VPSA Asynchronous Remote Mirroring between two VPSAs residing in different regions or between on premise and public cloud deployments or even between different Cloud Providers for Disaster Recovery (DR). In such cases Communication between the VPSAs is done via an authenticated and encrypted channel over the public Internet, thus requiring Public IPs.

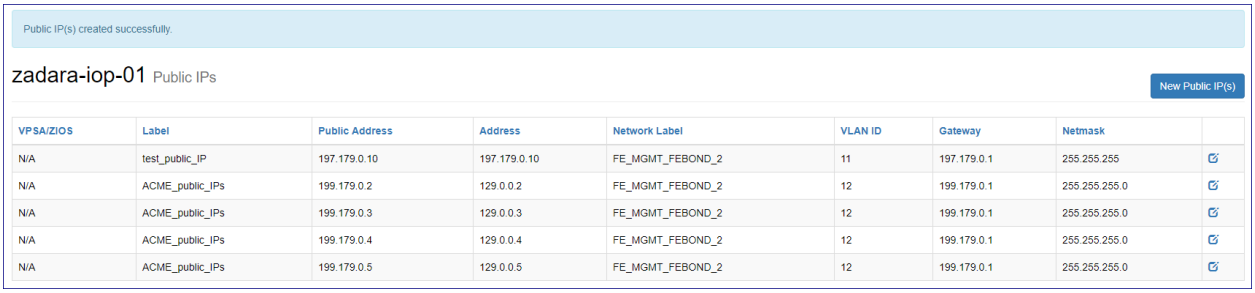
Cloud admins can use command center to define public IP addresses and assign then to VPSA instances. To define a public address range: go to the Public IPs tab and Click on the `New Public IP` button.

On the New Public IP(s) screen provide all the required details to configure the public IP range:



property	Description
Label	Descriptor for the public IPs
VLAN ID	a new\existing VLAN for this Public IP range (different from the cloud tenants VLANs
Gateway	Public IP network Gateway
Netmask	Public IP network subnet mask
Public IP range	Range of external public IP addresses to be defined
IP range	In case NAT is being used : Corresponding internal IP range otherwise : identical to the external range

To confirm click on the `Submit`, The public IP addresses range will be defined and ready for VPSA allocation.



CHAPTER

ELEVEN

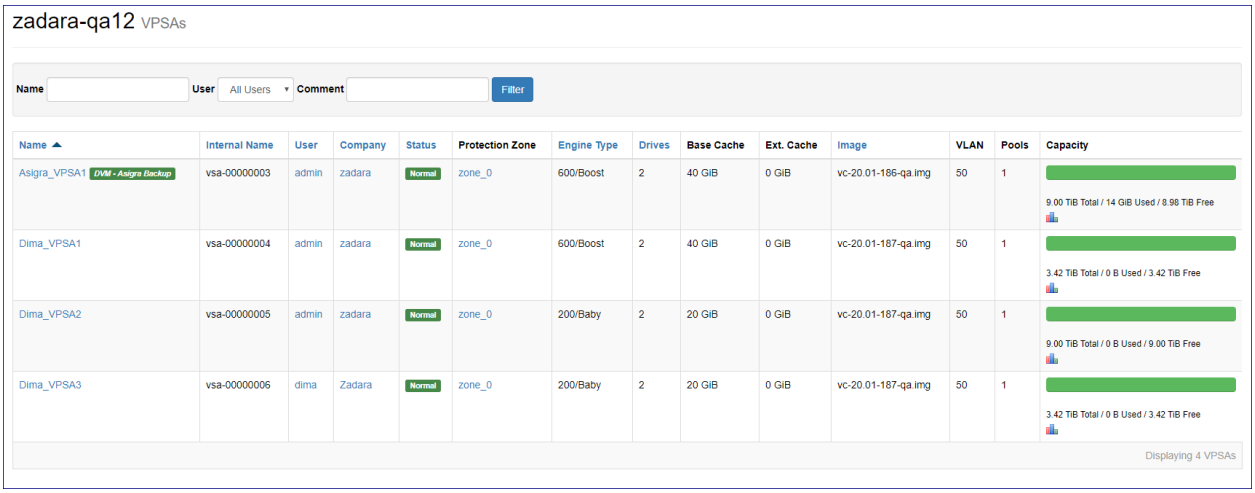
MANAGING DATA SERVICES

Zadara Cloud administrator can use Command Center to manage mange and monitor data services deployed on Zadara cloud.

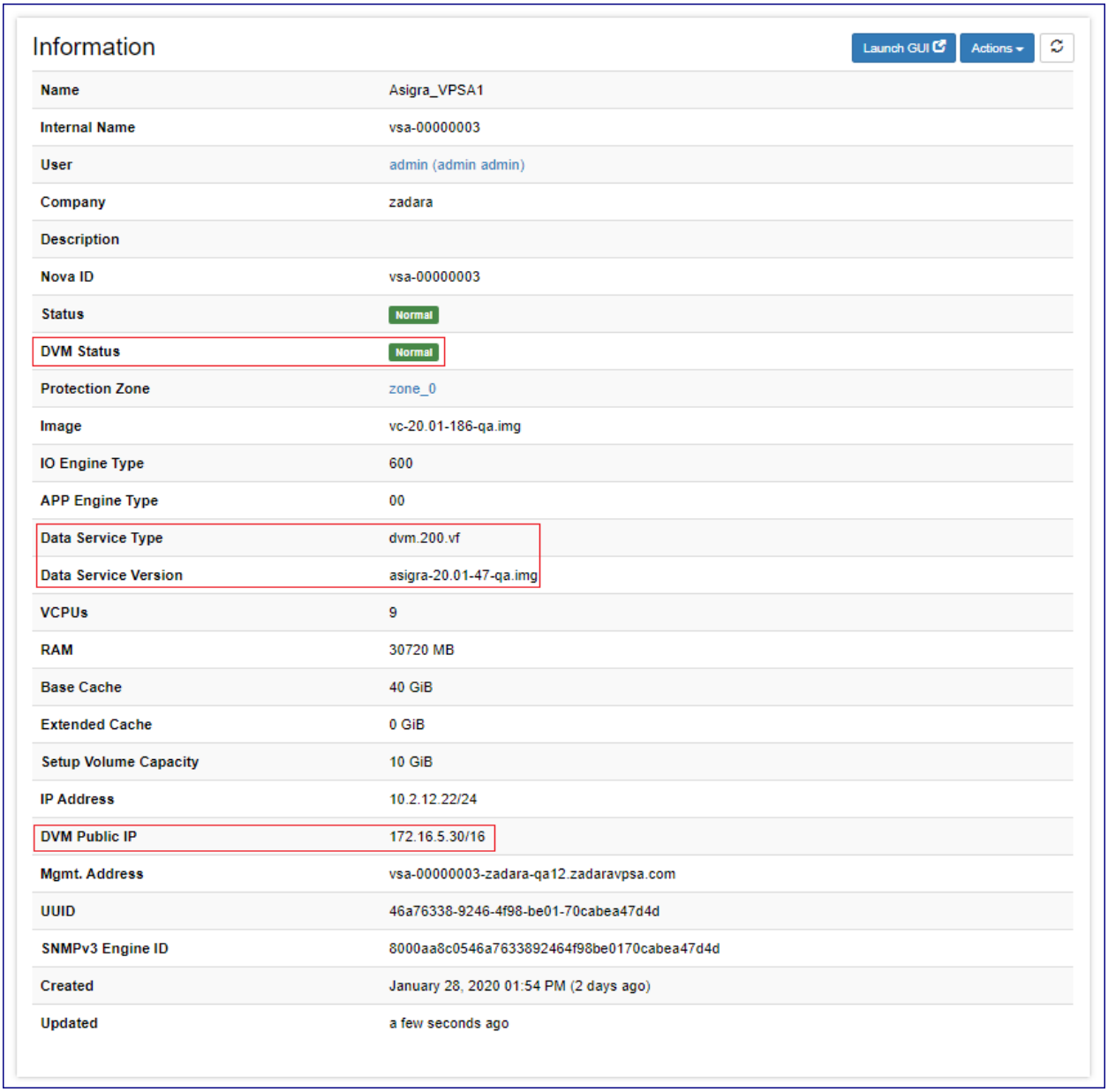
Command center displays the status of data services environments (VPSAs and data services virtual machines) and allows the configuration of data services properties.

11.1 Monitoring Data Services Environments

Command center Displays data services VPSA as part of the cloud VPSA inventory, A **DVM** label containing data service identification is attached to the VPSAs allowing for its identification as a data services environment.

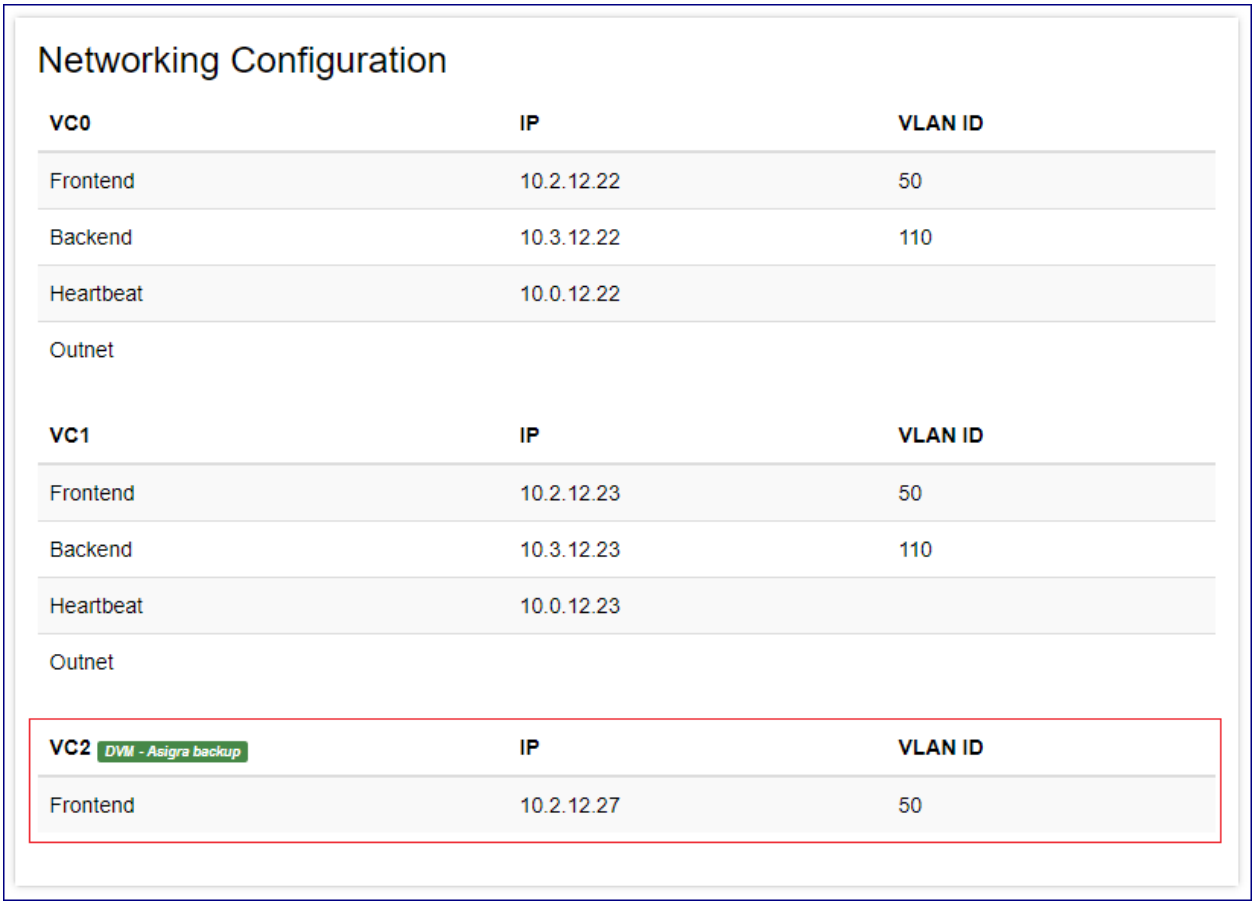


The Data Services VPSA properties contains specific items that present information on the data service configuration and status:



property	description
DVM Status	Status of the DVM Virtual Controller
Data Service type	Data service image type
Data Service version	Data service image version
DVM Public IP	The Public IP address attached to the data services VM

The Data Services VPSA Networking Configuration also includes the networking configuration of the Data Services Virtual Controller.



Networking Configuration

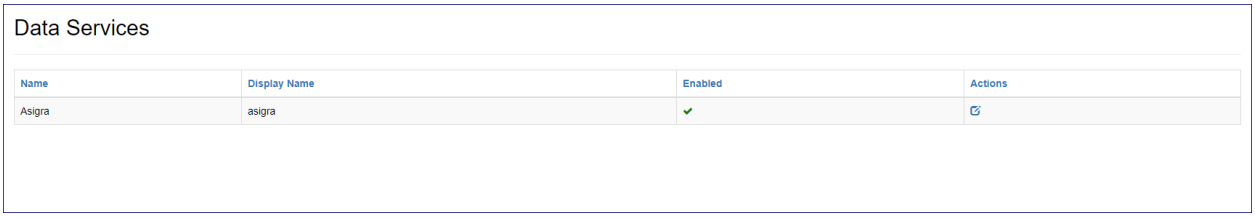
VC0	IP	VLAN ID
Frontend	10.2.12.22	50
Backend	10.3.12.22	110
Heartbeat	10.0.12.22	
Outnet		

VC1	IP	VLAN ID
Frontend	10.2.12.23	50
Backend	10.3.12.23	110
Heartbeat	10.0.12.23	
Outnet		

VC2 DVM - Asigra backup	IP	VLAN ID
Frontend	10.2.12.27	50

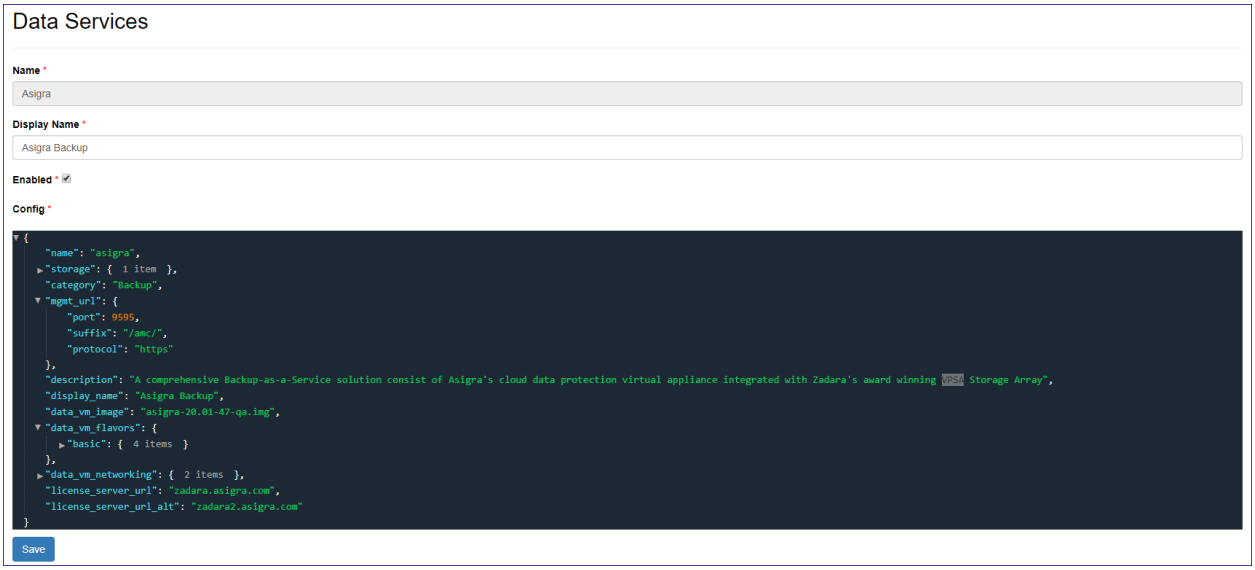
11.2 Configuring-Data-Services

Data services can be configured via Command centers Data Services tab.



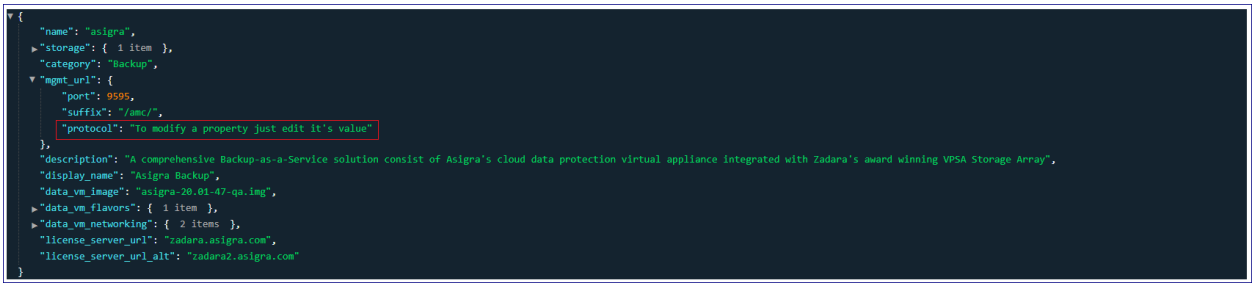
To configure a specific data service click on the Actions icon in the rightmost column that correspond to the requested data service.

configuring Asigra backup data service



From the Asigra data service configuration screens users can:

- Modify the data service display name
- Enable or disable the Asigra backup data service for the Cloud
- Configure data service specific settings using the configuration dialog



the Asigra data service configuration dialog allows you to set the following:

Data VM storage configuration

property	description
Block	SAN(Block) Disks size and count
File	Filesystems(NAS) size and count

Provisioning Portal(Ecommerce) general attributes

property	description
category	Provisioning Portal data service category
description	Data Service Description (displayed when user selects on the data service in provisioning portal)
display_name	Data service display name in provisioning portal
data_vm_image	image file used when provisioning a data VM for this service

Provisioning Portal(Ecommerce) data service flavors attributes

property	description
flavor	Data VM flavor internal type
vm_count	Data VM count for this data service
vpsa_flavor	Bundled VPSA internal type
display_name	Flavor display name

Data VM networking attributes

property	description
fe_allowed_ports	Ports that are allowed on the data VM front end network
public_ip_allowed_ports	Ports that are allowed on the data VM public network

Data VM licensing attributes

property	description
license_server_url	Primary licensing server URL
license_server_url_alt	Alternate licensing server URL

CHAPTER

TWELVE

PERFORMING IMAGE MANAGEMENT

Using Command Center administrators manage virtual machine images for:

- VPSA
- VPSA Object storage
- CCVM

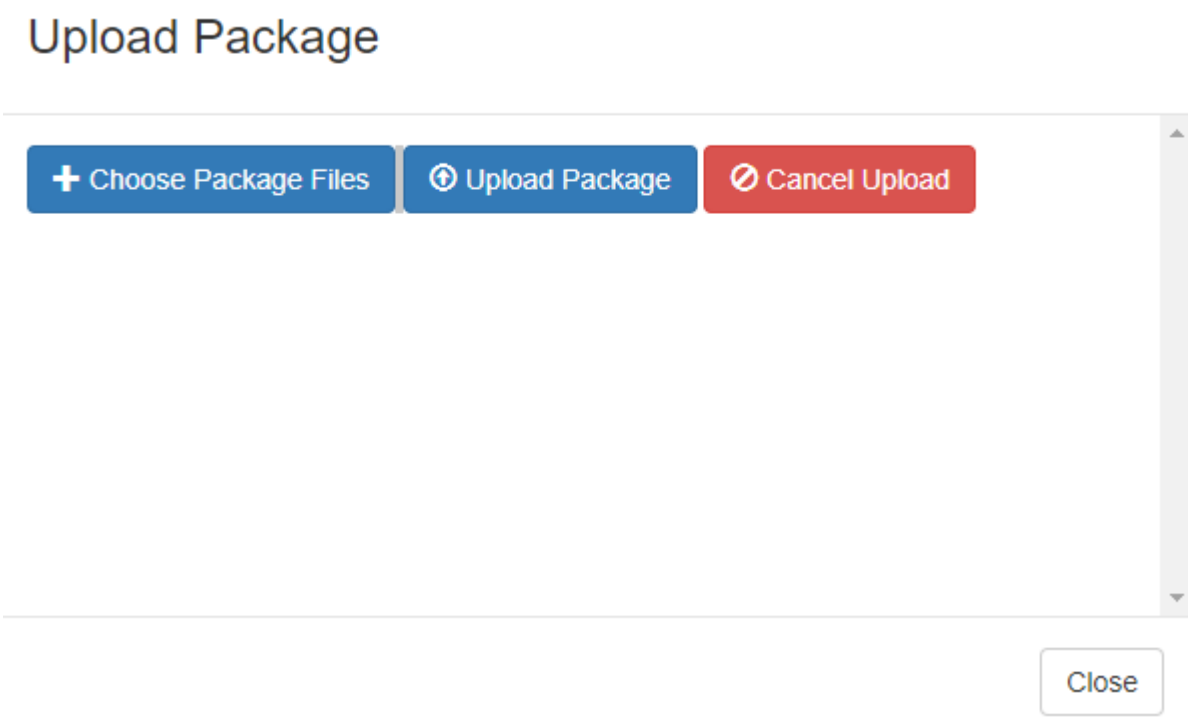
Cloud administrator can pull specific images from a repository and set a set of images a default, Default images will be the ones deployed when a new VPSA instance is crated.

12.1 Pulling Package And Registering Images

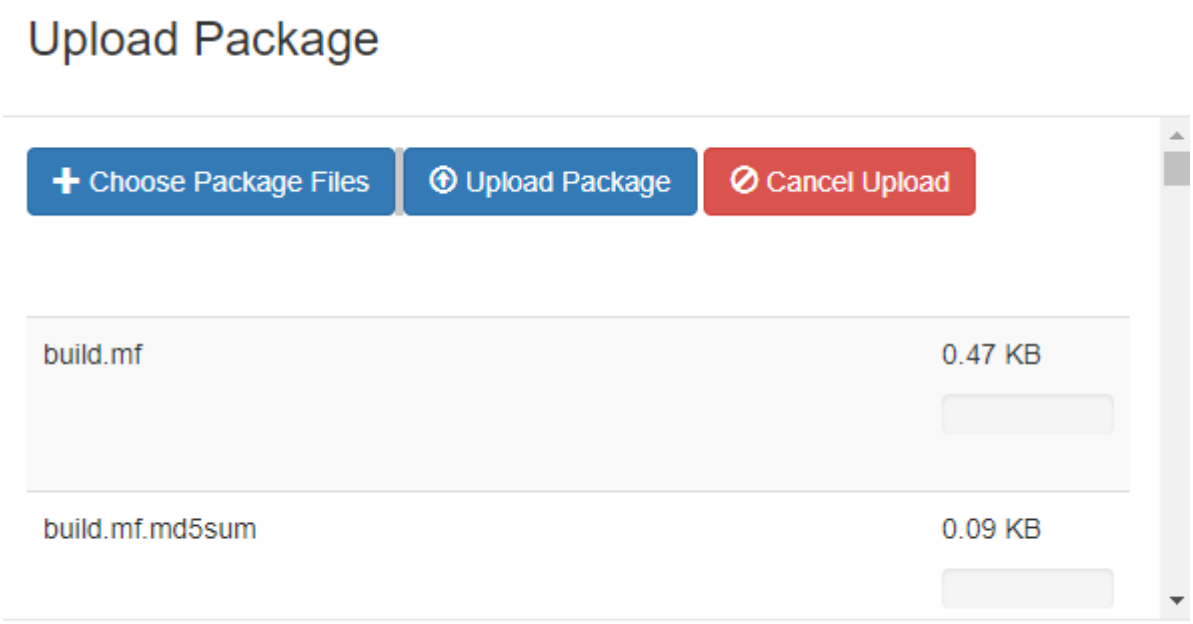
To make new virtual machine images available for cloud users image packages must be pulled from Zadara repository and the images registered register. To pull image packages from the Zadara repository click on the icon on the top right part of the screen and select `manage cloud packages` from the drop down menu. Make sure that you repository location is set to default(as shown below) or to a valid location accssible via the S3 protocol and containing the relevant image packages, a list of available image packages should appear. You can regenerate the list of packages available in the repository by clicking the refresh icon next to the screen title.

Note: Zadara storage public image repository is: s3://zadarastorage-install/ and it is set as the default Command center repository.

Packages can also be uploaded from local storage in case a package repository is not available or reachable from the cloud. To upload a package from local storage click on the `Upload Package` button, on the popup windows that will appear click on `Choose Package File` and use the file-grid to navigate into a folder containing cloud package files and select all of them.



A list of the selected files will be populated to the popup window, to begin uploading the package click on `Upload Package`.



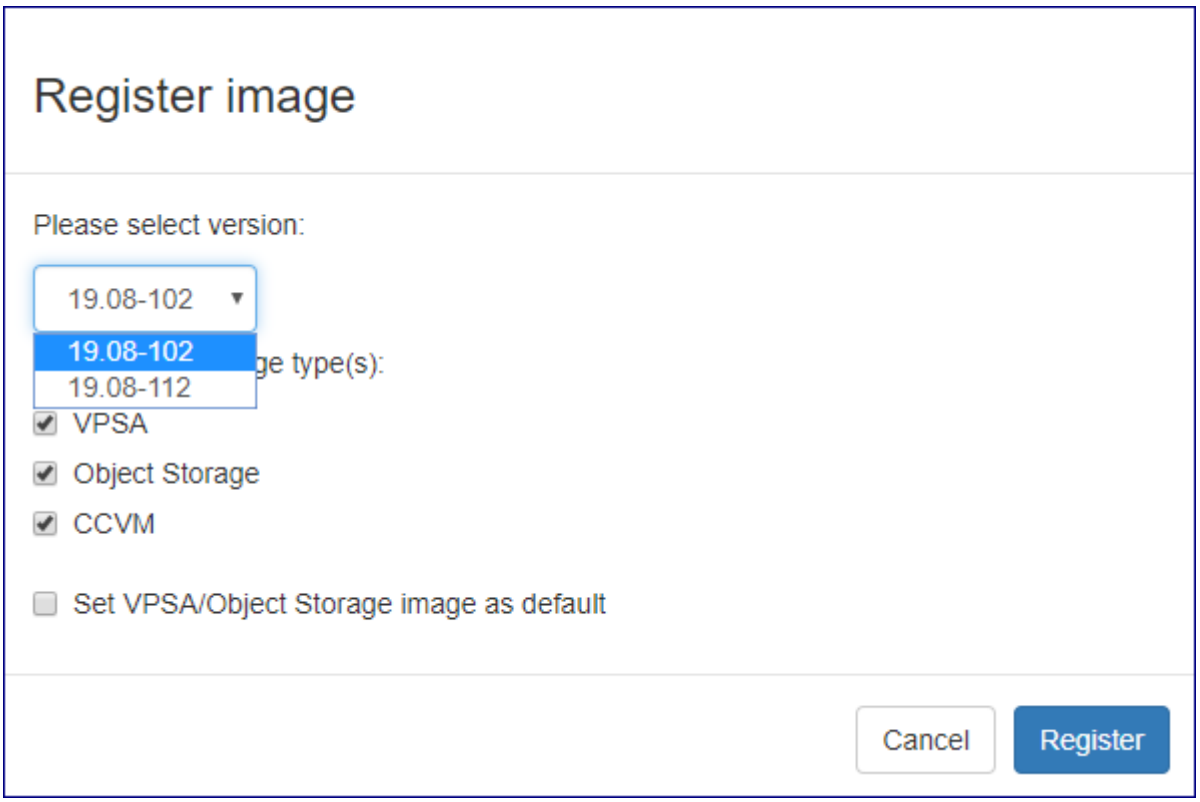
Upload progress is tracked on a file level progress bar. When file upload and registration process are finished the package will be added to the available packages grid.

To download a specific package locate it on the package list, make sure its status is Available for download and click the `Download` button.

Downloaded packages can be erased from local storage once they are no longer required. To erase a package click on the `erase` button for the image and confirm the package deletion in the popup window that will appear.

To register mages from the downloaded package go to the Command center Images tab and click on the `Register image from local repository` button. On the popup dialog that will appear wait for the package version list to load and select the specific version from which you would like to register the images. Select the Images you would like to register (VPSA, Object storage or CCVM) and weather you would like to set them as the default image for new VPSA deployments and click the `Register` button to confirm the operation.

✔ **Note:** You can set a specific image as default at any time by clicking the downward arrow button for the specific image and select Set default from the drop down menu.



A registered image can be later deleted by clicking the downward arrow button for the specific image and select Delete from the drop down menu.

CHAPTER

THIRTEEN

CUSTOMIZING VPSA AND OBJECT STORAGE USER INTERFACE

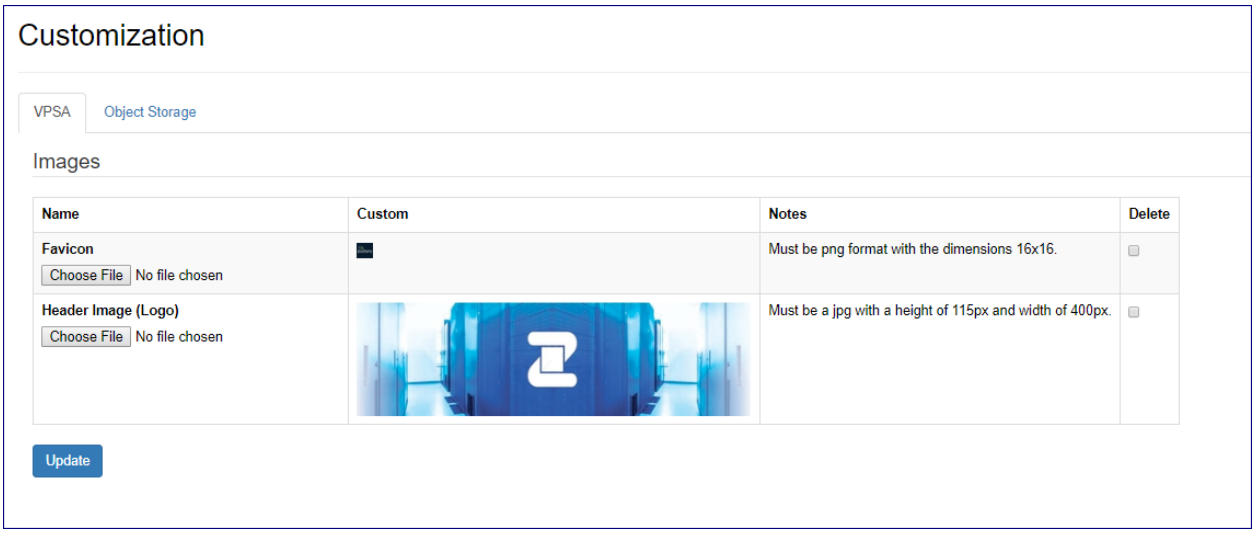
Command center allows cloud administrators to personalize their underlying VPSA/VPSA object storage User interface look and & feel by modifying the VPSA login header image and the favicon which appears on the browser tab and the UI left menu panel.

To customize the underlying VPSA/VPSA object storage UI images for the login header and the favicon should be prepared in advance according to the following demands:

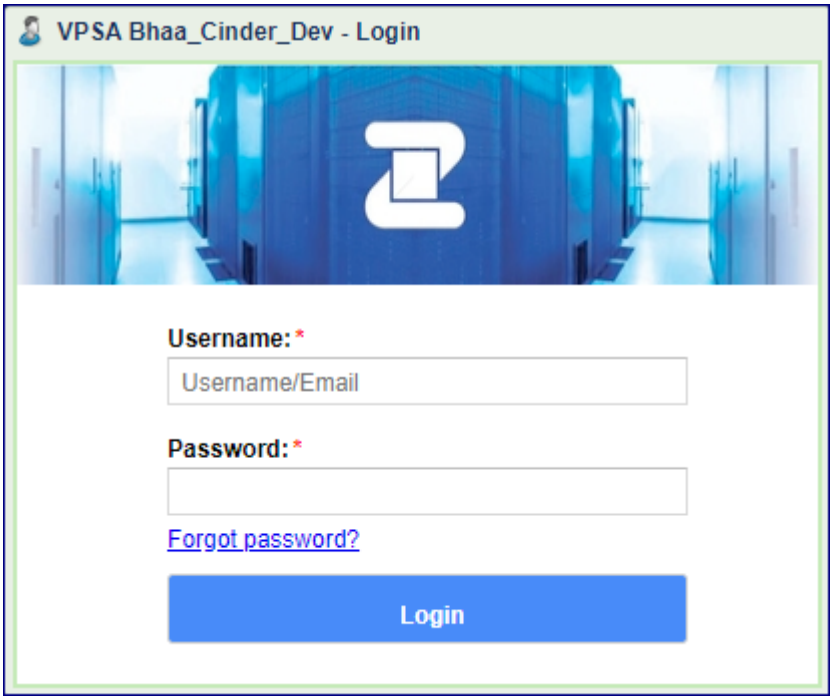
- Login header image must be in jpeg format and in the following dimensions : height 115px and width 400px
- Favicon image must be in png format and in the following dimensions : height 16px and width 16px.

To perform customization click on the icon on the upper right corner of the screen and select **UI customization** from the drop down menu. Click on the tab for the specific entity you would like to personalize (VPSA/VPSA Object Storage) and use the `Choose File` buttons to upload the images you prepared and confirm by clicking on the `Update` button.

After upload has been successfully performed you should see your modified header and favicon presented.



VPSA Login with modified header:



VPSA menu header with modified favicon:

✔ Note:

The modified header image and favicon will be applied to newly created VPSA/VPSA Object storage instances or for instances that has been hibernated and then restored.

To undo personalization and revert to the default header image and favicon click on the icon on the upper right corner of the screen and select **UI customization** from the drop down menu. Click on the tab for the specific entity you would like to personalize (VPSA/VPSA Object Storage) check the boxes on the Delete column for the images you want reverted and click on the `Update` button to confirm.

CHAPTER

FOURTEEN

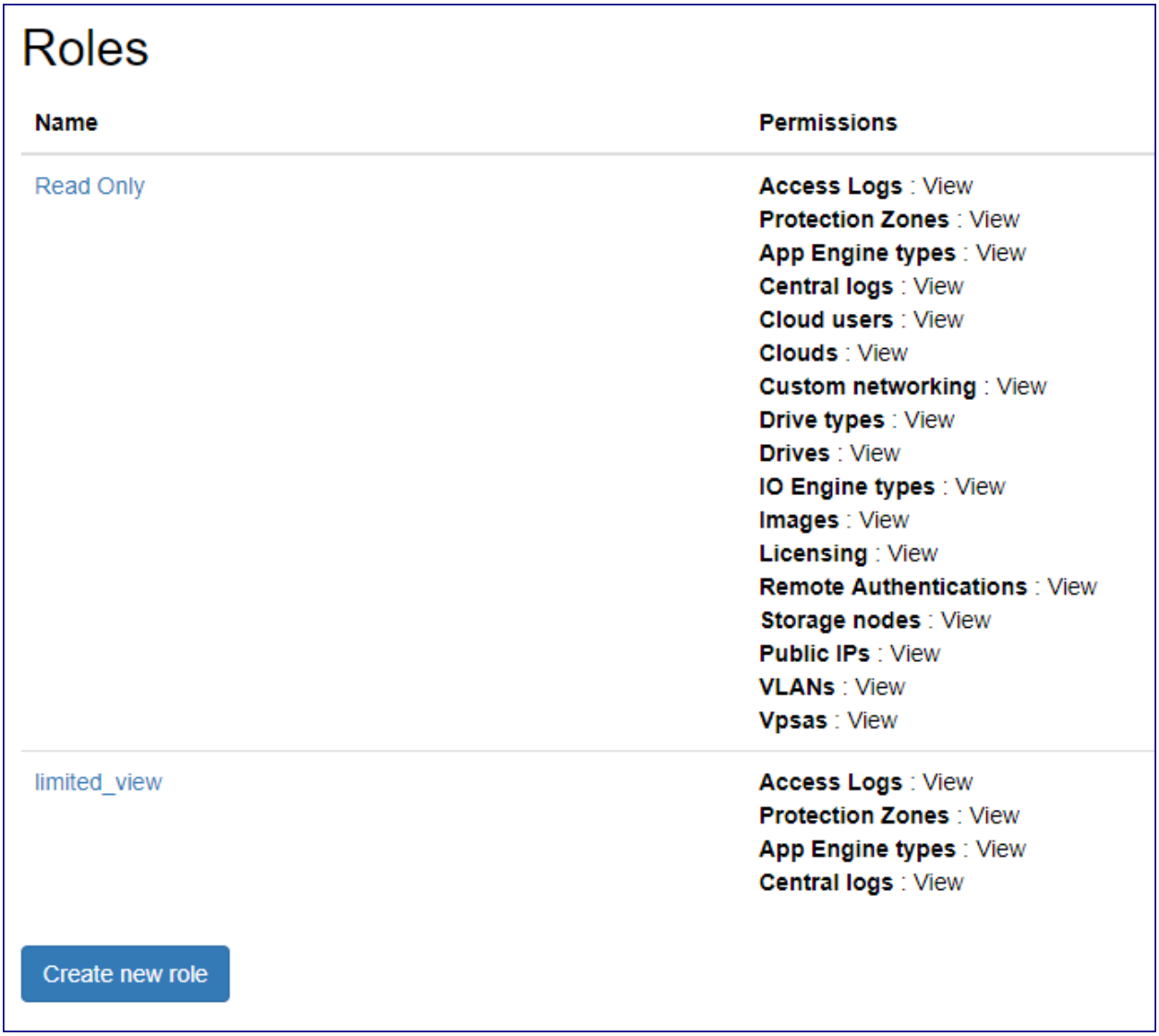
MANAGING COMMAND CENTER USERS AND ROLES

Command center provides role based user management functionality.
Granular per-activity user roles can be defined and assigned to command center user accounts.

Users and roles settings can be reached by clicking the icon on the upper right corner of the screen and selecting the **users\roles** options on the drop down menu.

14.1 Managing Roles

By default a view only non modifiable role with access to all managed resources exists in the system. Additional Roles can be defined as required.



Defining a new custom role

To define a new custom Role: click on the `Create new role` button and define the exact permission you would like to assign to the new role. Name the new role and click `create` to confirm creation. The newly created role with the specified permissions can be viewed from the roles screen.

✔ Note:

The 'select all' or 'import role' options can be used to simplify and shorten role creation process.

Editing a custom role

To edit a custom role click on the downward arrow icon on right side of the screen and select the Edit option from the drop down menu. The edit role screen will load, Modify the custom role as required and click on the update button to apply modifications.

Deleting a custom role

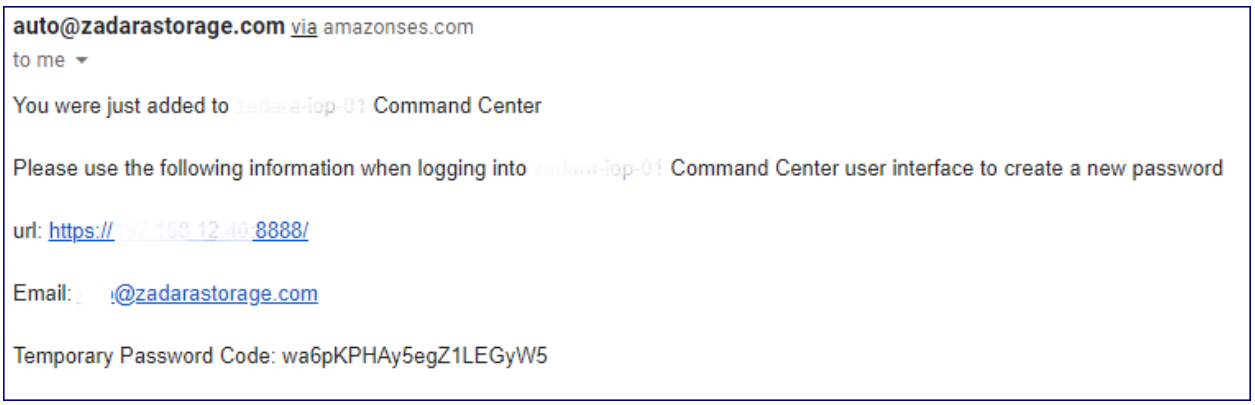
To edit a custom role click on the downward arrow icon on right side of the screen and select the Destroy option from the drop down menu. A confirmation message will appear, Click on `confirm` to delete the custom role.

14.2 Managing Command Center Users

Defining a new local user

In the users management screen click on the `create new user` button

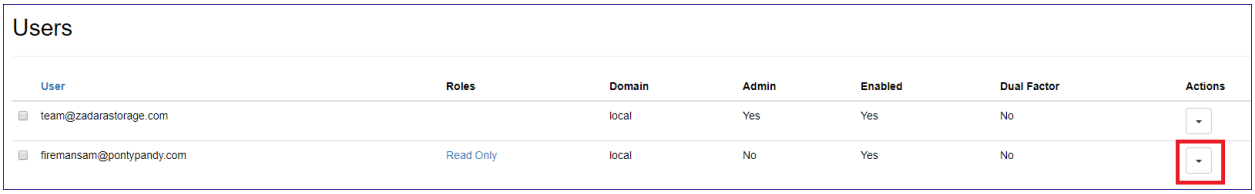
Provide the users email address (that will serve as his Command center user id), First and last name tick the admin checkbox if this user requires full administrative privileges or select a specific role to assign for the user and click on the `Create` button. A confirmation message will be displayed specifying that the newly created user will be emailed with a temporary password for his first login.



On the first login to Command center the newly created user will be prompted to replace his temporary password.

Disabling a local user

From the users management screen locate the user you would like to disable and click on the downward arrow button on the right side of the screen.



On the drop down menu select Disable, A confirmation message will appear on the upper part of the screen and the users enabled property will be set to No.

Deleting a local user

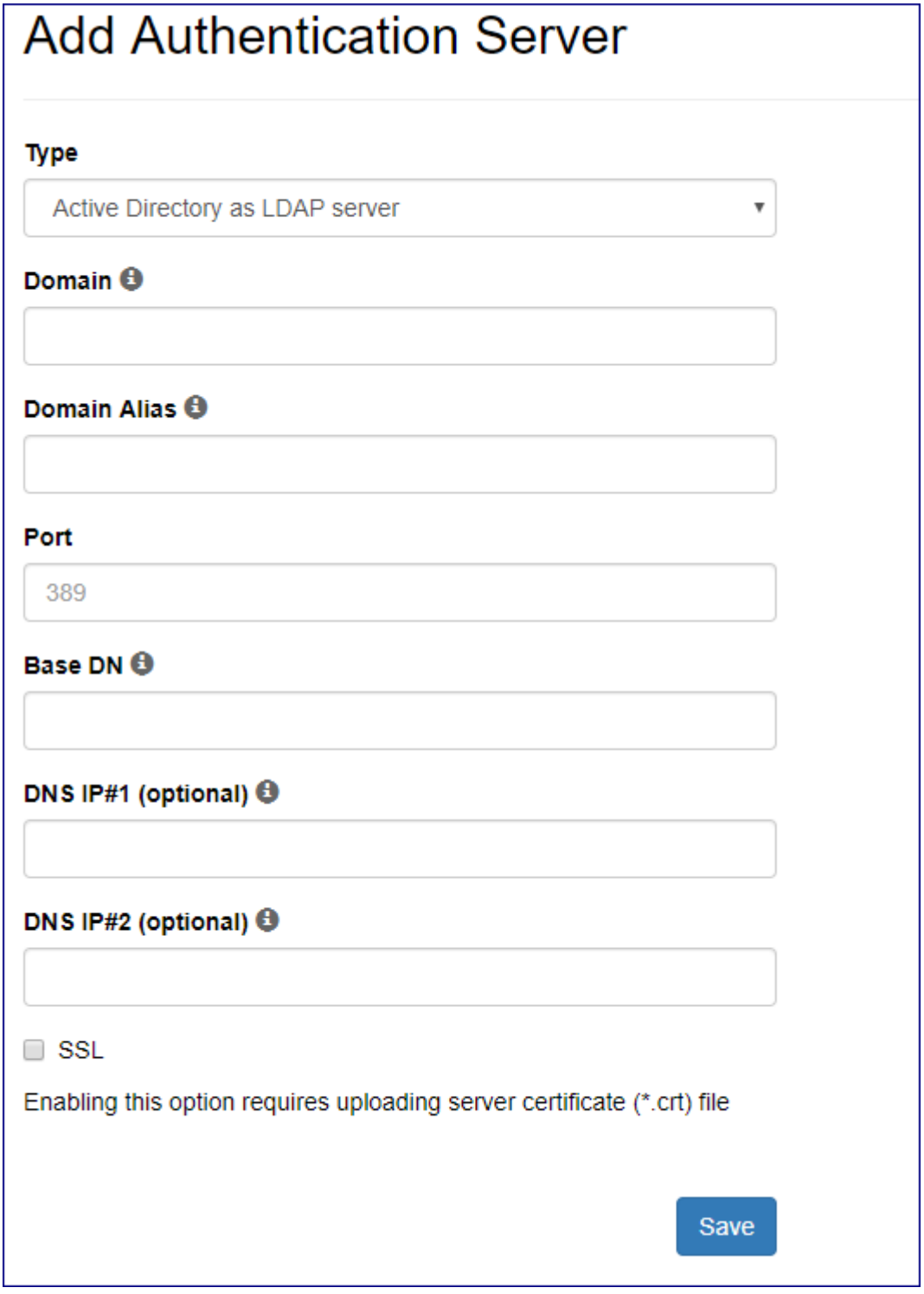
From the users management screen locate the user you would like to disable and click on the downward arrow button on the right side of the screen.

On the drop down menu select Delete, A popup windows requesting confirmation will appear, review that the user id about to be deleted is correct and click on `confirm` to perform deletion.

Importing users from an external directory

Defining connection to a directory server

To import users from an external directory service a connection to the service has to be defined. From Command center main dashboard click the icon on the upper right corner of the screen and select Remote Authentication from the drop down menu. Click on the `Add Authentication Server` button and provide the required details for the external directory connection.


Add Authentication Server
Type
Active Directory as LDAP server
Domain
Domain Alias
Port
389
Base DN
DNS IP#1 (optional)
DNS IP#2 (optional)
SSL
Enabling this option requires uploading server certificate (*.crt) file
Save

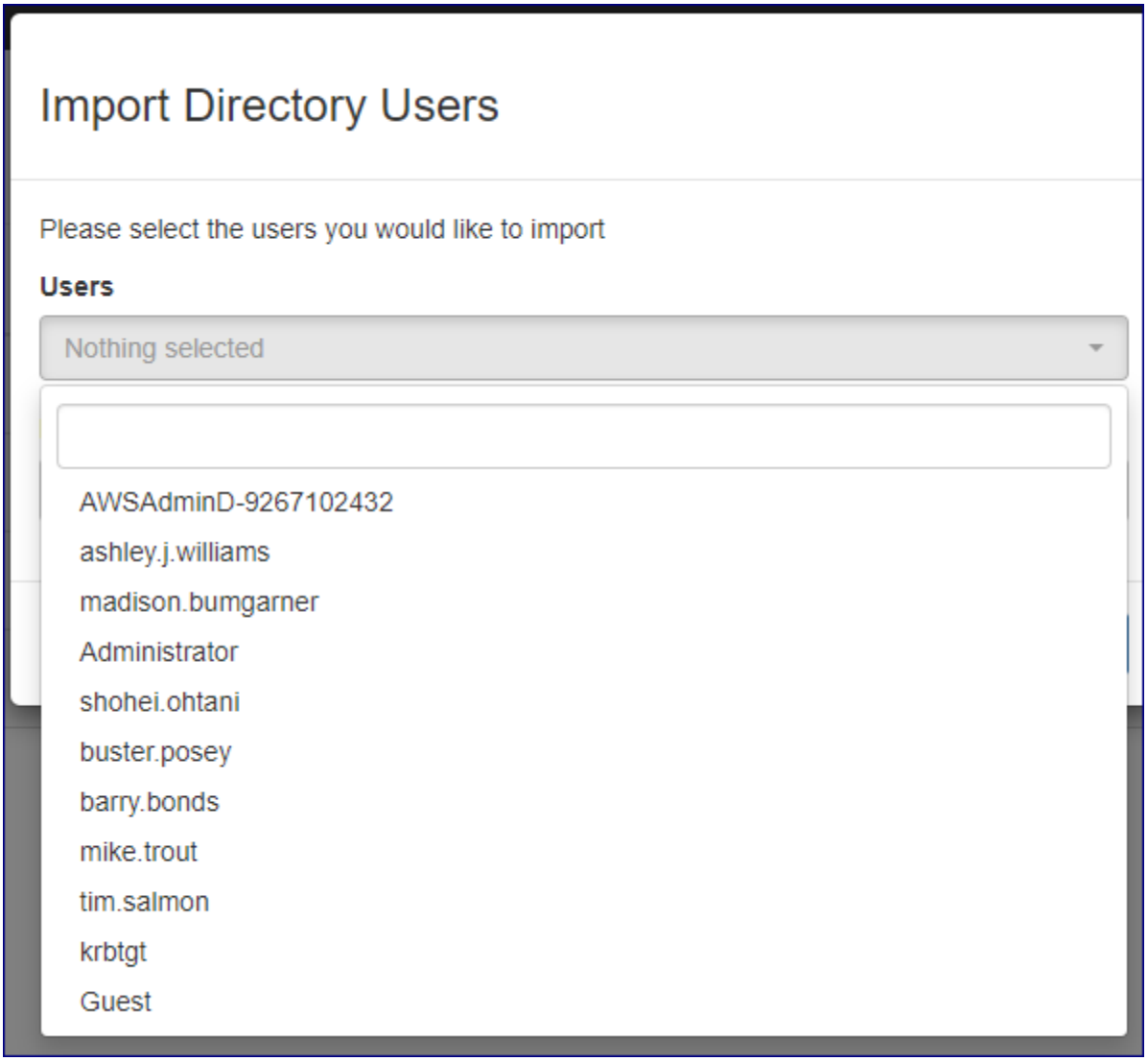
parameter	Description
Type	Directory type (currently AD LDAP is supported)
Domain	FQDN for the Domain
Alias	Short name for the domain
Port	LDAP service port
Base DN	DN for user search (format: CN=x,DN=y)
DNS IP #1	IP of the Domain DNS server
DNS IP #2	Alternate DNS IP
SSL	Whether to use SSL encrypted communication to the DC

After filling all required information click on the `Save` button to define the external directory.

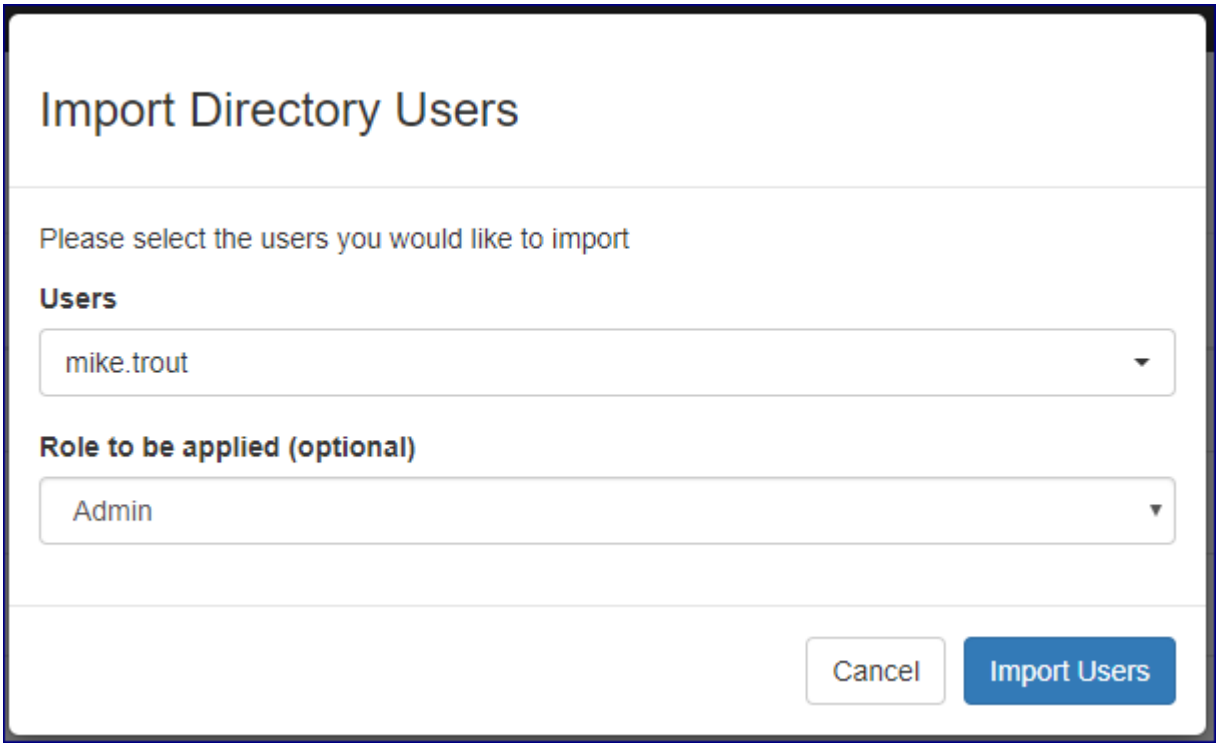
Important: Command Center uses LDAP or LDAPS protocol to integrate with Microsoft Active Directory. LDAP connectivity is done over port 389/TCP or 636/TCP in case of LDAPS.

Importing domain users

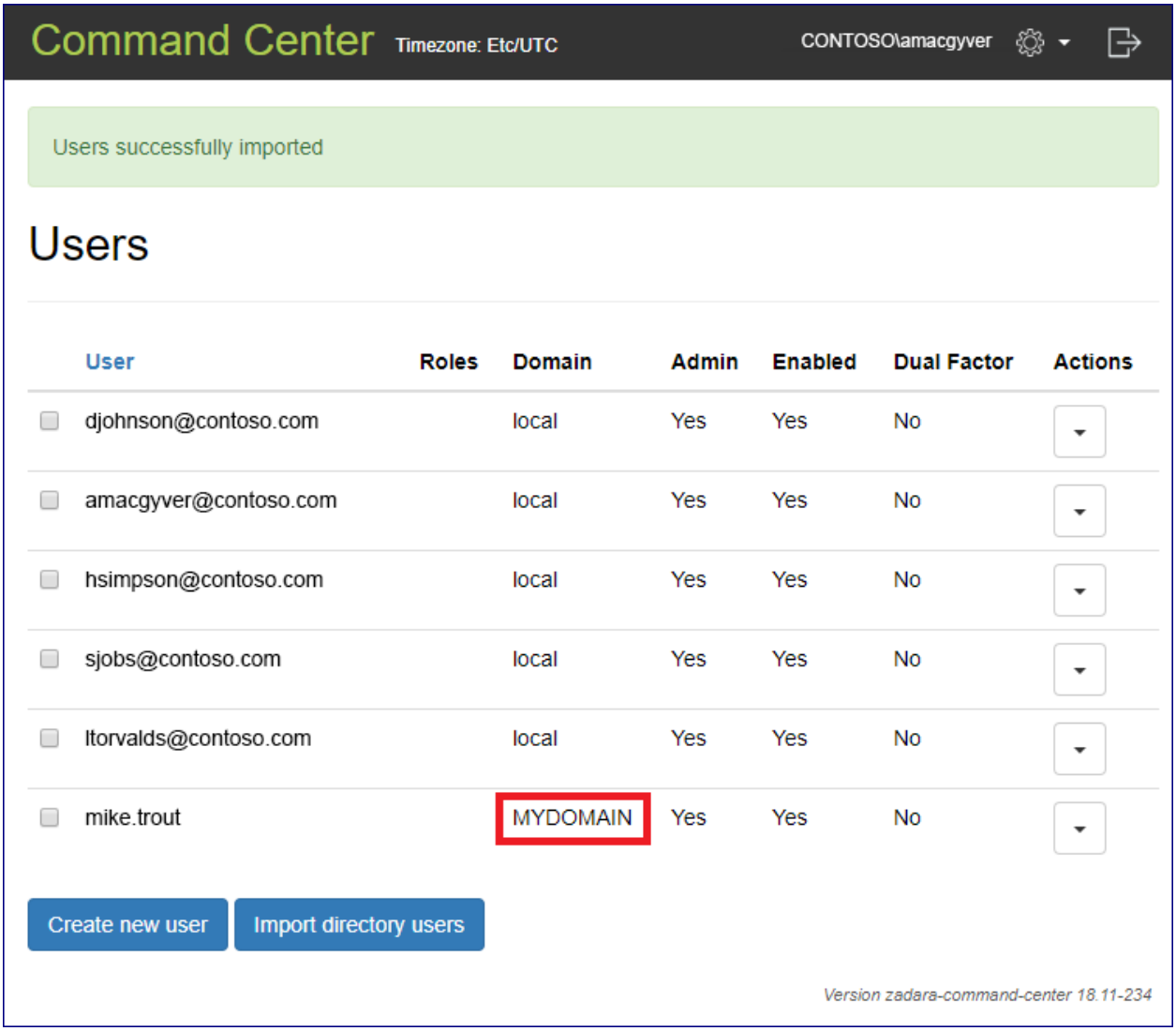
From the users screen click on the `import directory users` button. Select the domain name for the directory server you defined and type the logon credentials for domain connectivity. A pop up screen containing a list of domain users will appear, Select the ones you would like to allow command center logon for.



Same as with creating a local user; each imported user can be assigned with a role that will determine its specific privileges.



After confirming creation the imported users will appear on the command center users list, Imported can be differentiated from local users via the domain property displayed on the users management screen.


Command Center
Timezone: Etc/UTC
CONTOSO\amacgyver
Users successfully imported
Users
User
Roles
Domain
Admin
Enabled
Dual Factor
Actions
djohnson@contoso.com
local
Yes
Yes
No
amacgyver@contoso.com
local
Yes
Yes
No
hsimpson@contoso.com
local
Yes
Yes
No
sjobs@contoso.com
local
Yes
Yes
No
ltorvalds@contoso.com
local
Yes
Yes
No
mike.trout
MYDOMAIN
Yes
Yes
No
Create new user
Import directory users
Version zadara-command-center 18.11-234

CHAPTER

FIFTEEN

MANAGING CLOUD SETTINGS

Cloud administrators can use Command Center to configure global cloud settings.

Cloud settings can be reached by clicking the icon on the upper right corner of the screen and selecting the **Settings** option on the drop down menu.

Cloud setting managed by command center are divided into 5 categories:

Category	Description
General	General Cloud level setting
Security	Cloud level security settings
Network	Cloud networking parameters
VPSA	Settings effecting VPSA instances defined on the cloud
Object Storage	Settings effecting VPSA Object Storage instances defined on the cloud
Management	Management protocols settings

15.1 General Cloud Settings

General Settings

Cloud Name	Set the Cloud Name.
Domain Name	Set the Command Center Domain Name in the URL sent by email to users.
Internet Access	Set internet accessibilty of the cloud.
Support ticket method	Set the method the cloud will use to send support tickets.
Support Tickets Notifications	Set the email recipients to notify of support tickets
Emails sending method	Set the method the cloud will use to send emails.
Upload Endpoints	Set and manage upload endpoints.
ZSnap upload	Set ZSnap upload.
Metering data upload	Set Metering data upload.
Cloud configuration upload	Set Cloud configuration upload.
Cache/AFA-Meta drives settings	Set Cache/AFA-Meta drives settings
Mount Capacity Alert Threshold (GiB)	Set Mount Capacity Alert Threshold (GiB)
Ticket threshold	Set the ticket sending threshold.
CCVM Engine size	Set CCVM default Engine size
Automatic Drive Replacement	Automatic Drive Replacement.
Package Upload Size Limit	Set the maximum package upload size (GB).

Cloud Name Allows to change the Cloud name

✔ Note:

Cloud name can be set only if the cloud does not contain
any VPSA/VPSA Object Storage entities

Domain Name

Sets the domain name that will be used for sender address in emails sent from the cloud.

Internet Access Toggles between Online and Offline Cloud. An Offline cloud is defined as a Cloud that has no internet

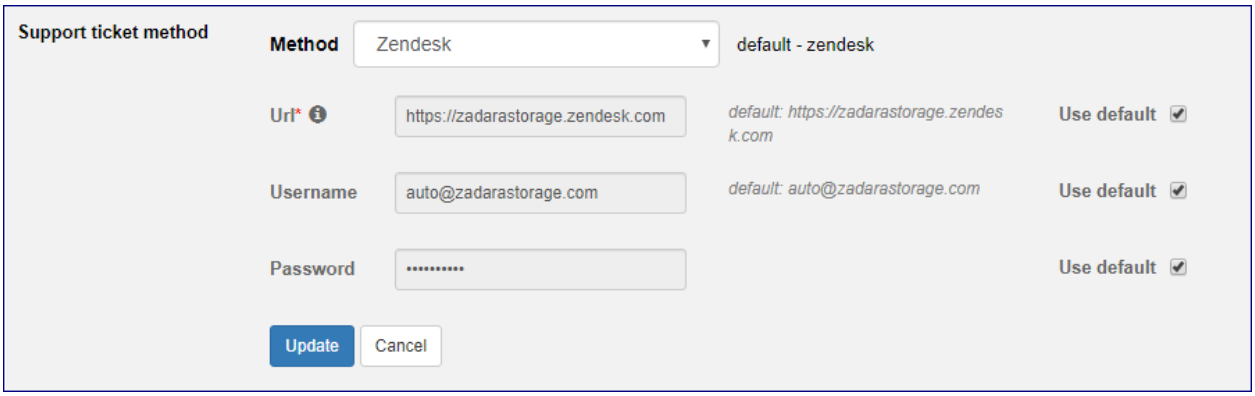
access for management. Users of offline clouds are required to provide local SMTP , FTP and NTP services and to configure support ticket and Zsnap methods accordingly. In offline clouds license management is also performed manually as there is availability of a remote licensing server.

Note:

MAG files will be created and upload only in clouds with internet access

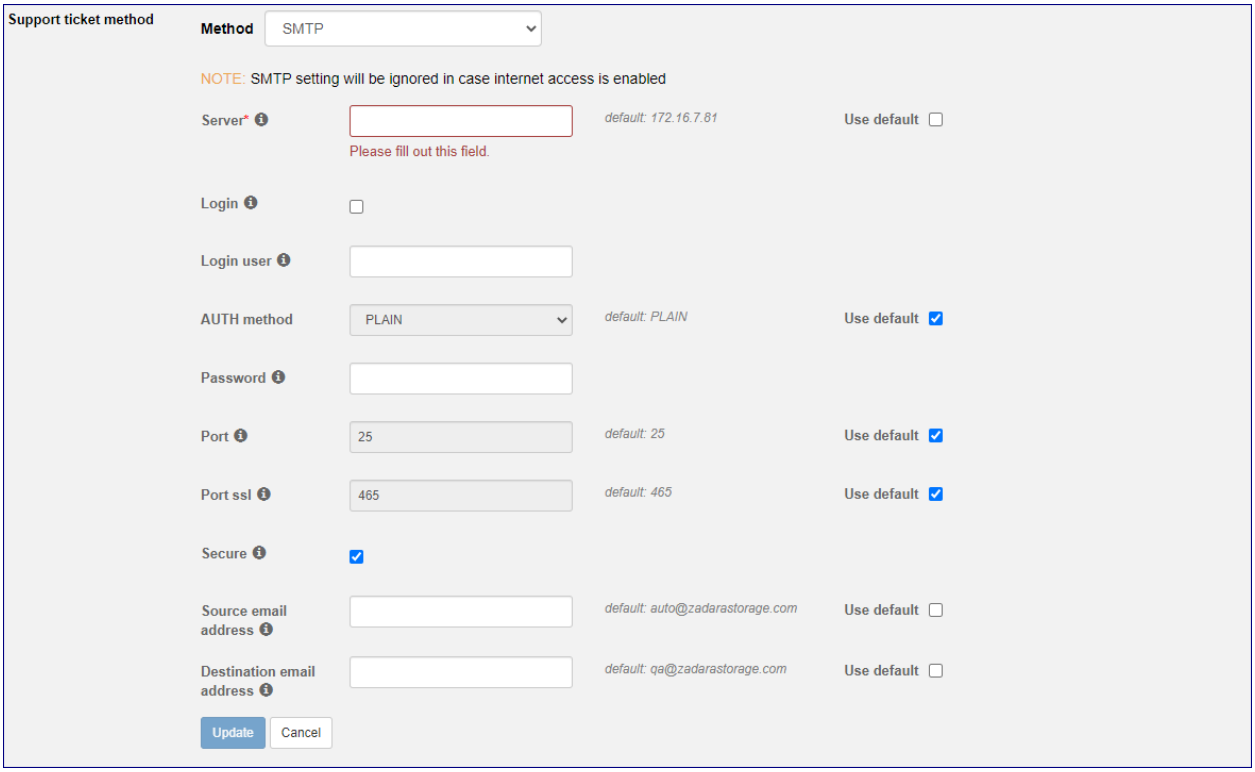
Support ticket method Toggles support tickets sending on/off and to select the ticket transmission method. Valid options for support ticket transmissions are Zendesk or SMTP

Settings for Zendsesk ticket transmission:



Parameter	Description
Zendesk URL	URL for the Zendesk Application
Zendesk user	User id used for Zendesk login
ZenDesk Password	Zendesk users password

Settings for SMTP ticket transmission:



Parameter	Description
Server	SMTP server address
Login	SMTP server login required?
Login User	SMTP User id
AUTH method	SMTP Authentication method to be used (PLAIN or LOGIN supported)
Password	Password for SMTP user
Port	TCP port number for SMTP service
Port SSL	TCP port number for SMTP service is SSL is used
Secure	Force secure SMTP(via TLS)
From user	Email sender address
To User	Email recipient address

Emails sending method

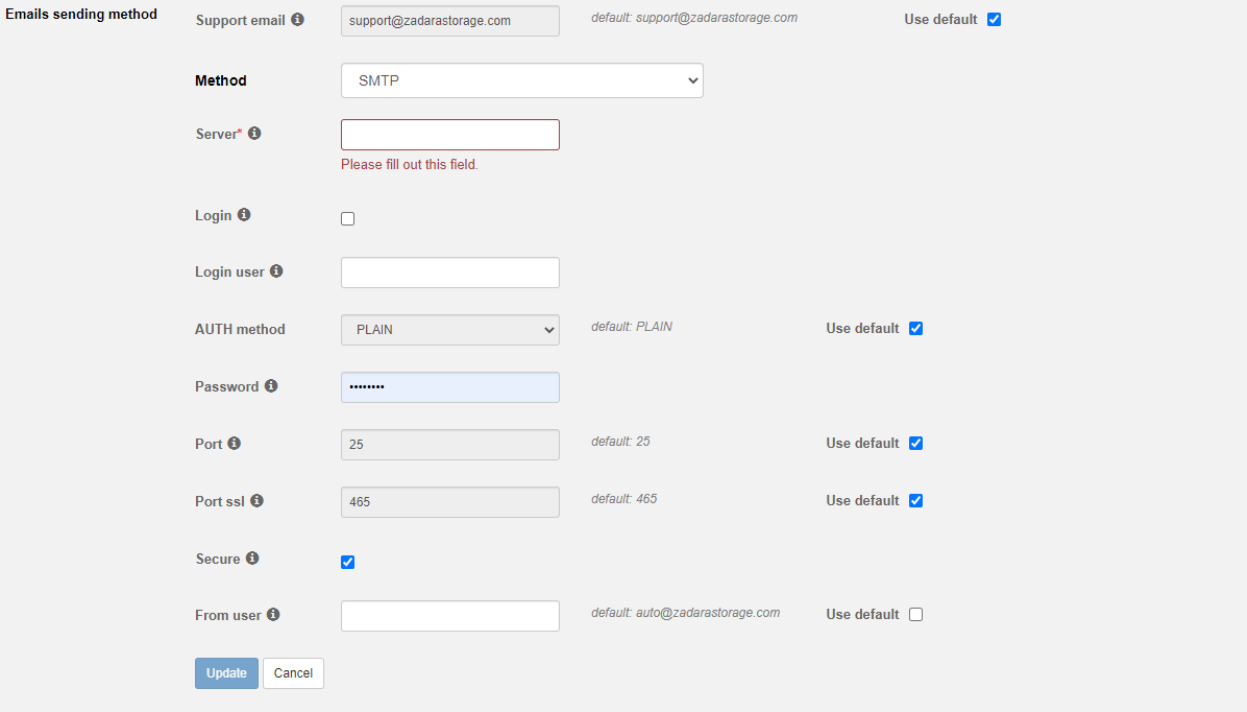
Allows the cloud admin to configure a personalized email account from which customer emails will be issued. The cloud admin can also define the support email address which will refenced in the emails body as the support contact email.

Note:

In case emails sending method is not defined and the cloud has internet connectivity customer emails will be issued from Zadara's AWS SES email account.

In case emails sending method is not defined and the cloud does not have internet connectivity customer emails will be issued from the SMTP account defined in the Support ticket method section.

Settings for personalized SMTP account



Parameter	Description
Server	SMTP server address
Login	SMTP server login required?
Login User	SMTP User id
AUTH method	SMTP Authentication method to be used (PLAIN or LOGIN supported)
Password	Password for SMTP user
Port	TCP port number for SMTP service
Port SSL	TCP port number for SMTP service is SSL is used
Secure	Force secure SMTP(via TLS)
From user	Email sender address
To User	Email recipient address

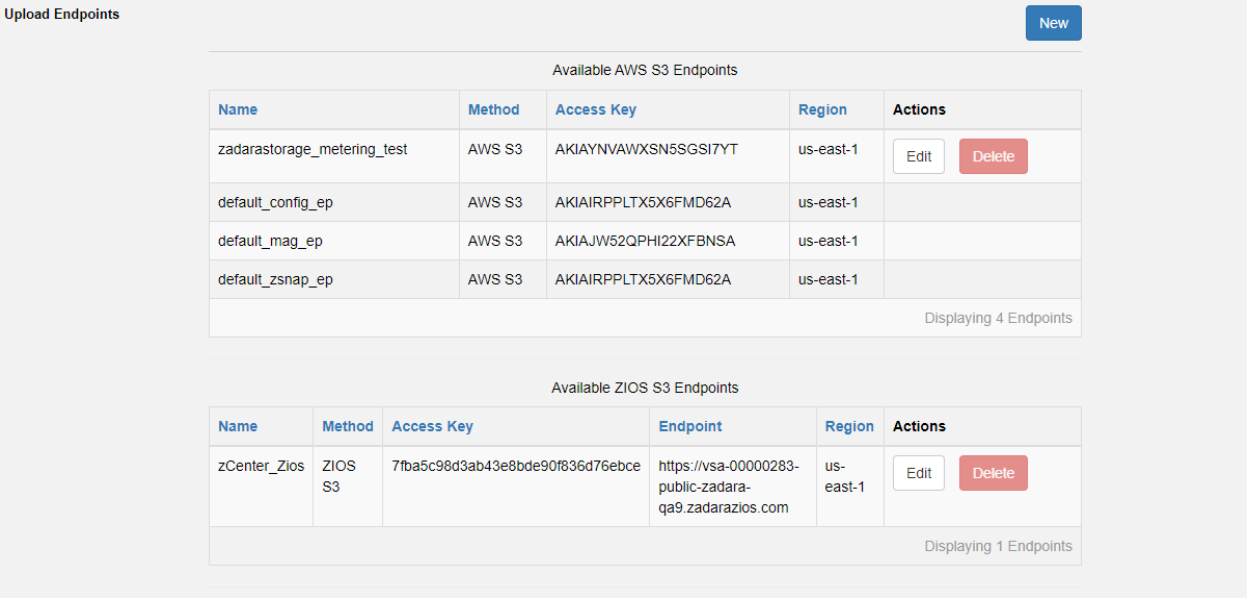
Upload endpoints settings

Allows the cloud administrator to configure alternate endpoints for upload of cloud Zsnaps, Mag and configuration information

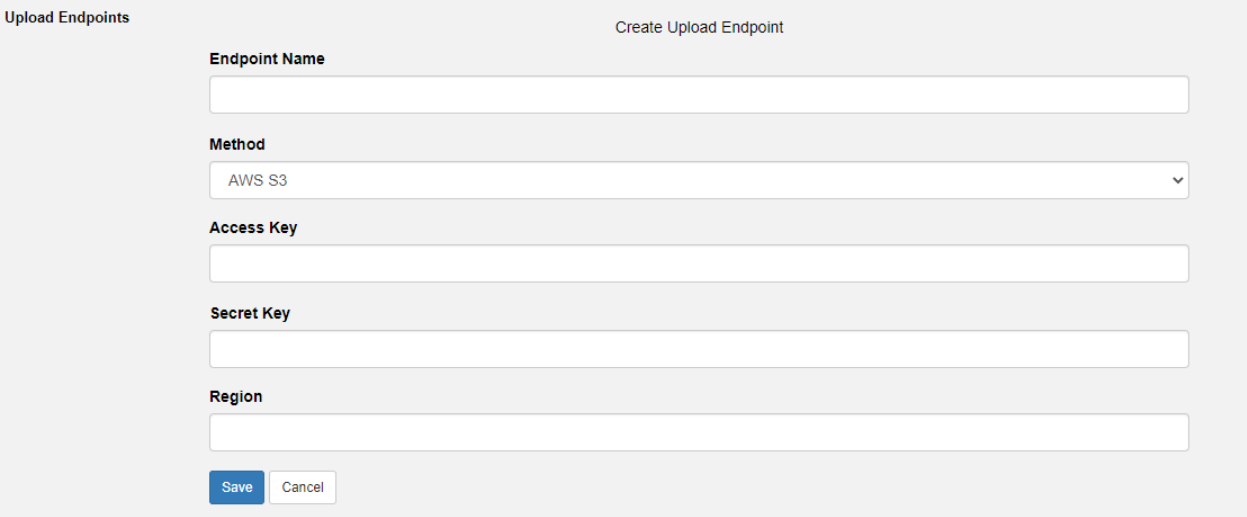
Upload endpoints can be of the following types:

- AWS S3 endpoint
- VPSA Object Storage endpoint
- FTP target

Upon entry this section will display details on the clouds configured endpoints.



The Cloud administrator can configure additional upload endpoints by clicking on the `New` button on the top left corner of this section.



Upload endpoint configuration requires the following input:

Parameter	Description
Endpoint name	A name for this upload endpoint
Method	Endpoint type(AWS S3/VPSA Object Storage/FTP
Access Key	in case of AWS S3/VPSA Object Storage a valid access key for this endpoint
Secret Key	in case of AWS S3/VPSA Object Storage a valid secret key for this endpoint
Server	in case of FTP the FTP server address
User	in case of FTP the FTP FTP user
Password	in case of FTP the FTP FTP password
Use Proxy	in case of FTP wether to use a proxy for FTP connection

To configure the new upload endpoint provide all required details and click on **Save**, your endpoint will be created. User configured endpoints can also be updated or deleted.

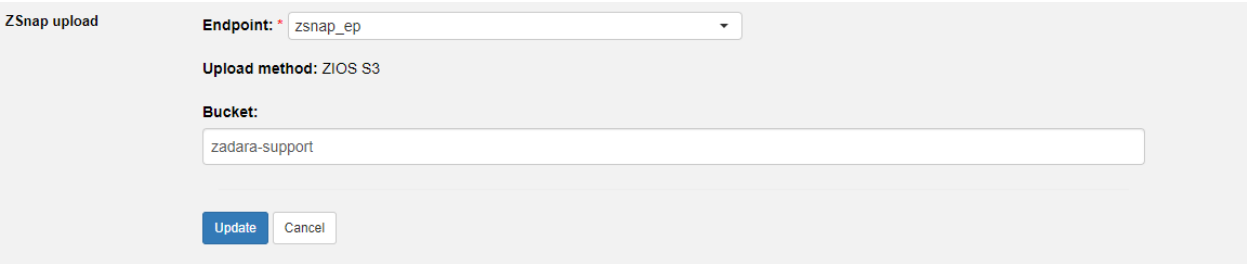
ZSNAP upload settings

Sets upload target used for the cloud zSnaps upload.

Note:

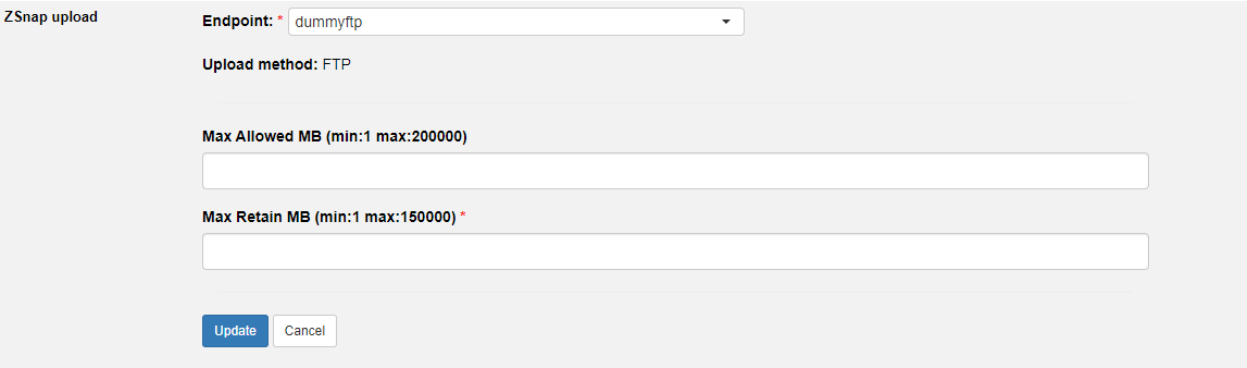
Only one upload endpoint can be specified for zSnap upload.

Settings for zSnap upload to an AWS S3/VPSA Object Storage endpoint:



Parameter	Description
Bucket	bucket for ZSANP upload

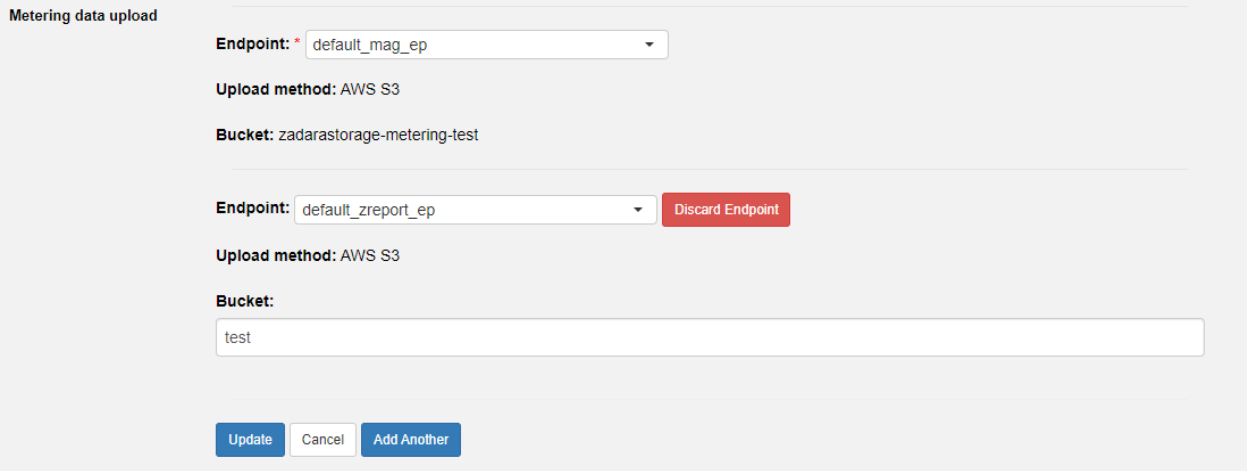
Settings for zSnap upload to an FTP endpoint



Parameter	Description
Max-allowed-mb	When using CCmaster FTP server. maximum ZSNAP capacity threshold
Max-retain-mb	When using CCmaster FTP server. minimum ZSNAP capacity retained

Settings for metering data upload

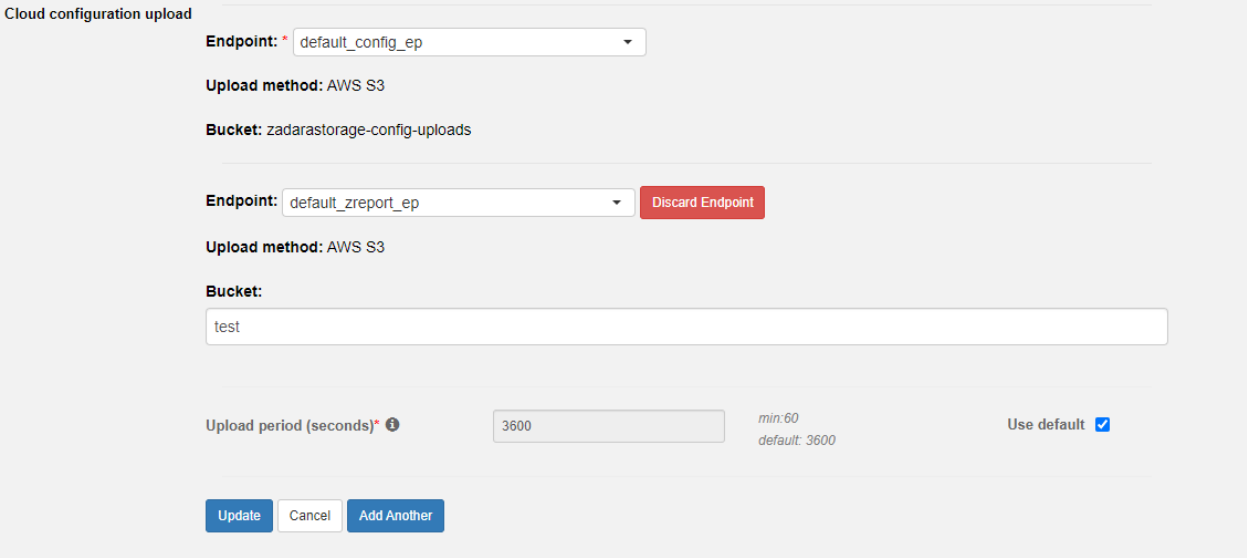
Sets the target endpoints to which metering data can be uploaded. Up to 3 AWS S3 endpoints can be configured for metering data upload. To add additional upload endpoints click on the `Add Another` button. Additional endpoints can also be removed by clicking on the `Discard` button.



Parameter	Description
Bucket	bucket for metering data upload

Settings for configuration data upload

Sets the target endpoints to which configuration data can be uploaded. Up to 3 AWS S3 endpoints can be configured for metering data upload. To add additional upload endpoints click on the `Add Another` button. Additional endpoints can also be removed by clicking on the `Discard` button.



Parameter	Description
Bucket	bucket for configuration data upload
Upload period (seconds)	Sets the configuration data upload interval

Cache/AFA-Meta drives settings

Configures the behavior of the cloud when provisioning VPSA all flash and whether to allow the use of cloud solid state drives as AFA cache instead of Optane drives.

✔ Note:

VPSA All Flash architecture was designed to utilize Optane drives to optimize overall system performance.
The use of Solid state drives as AFA cache should be limited for testing purposes only and coordinated with Zadara support.

Parameter	Description
Allow temporarily setting SSDs as AFA-Meta Drive	Enables setting SSDs as AFA cache
SSD Cache Max usable capacity	Sets the Maximum capacity that will be used for an SSD drive designated as AFA cache

Mount Capacity Threshold

Sets the Clouds /mnt/Nova folder capacity threshold. an alert will be issued in case this capacity threshold is exceeded.

Parameter	Description
Mount Capacity Alert Threshold (GiB)	Capacity treshold in GiB

Ticket threshold

Sets timed thresholds for specific events to be considered for support ticket generation:

Parameter	Description
Failed drive ticket time	Allowed Failure time before user ticket generation
Failed drive support ticket time	Allowed Failure time before support ticket generation
Failed heartbeat ticket time	Allowed Failure time before user ticket generation

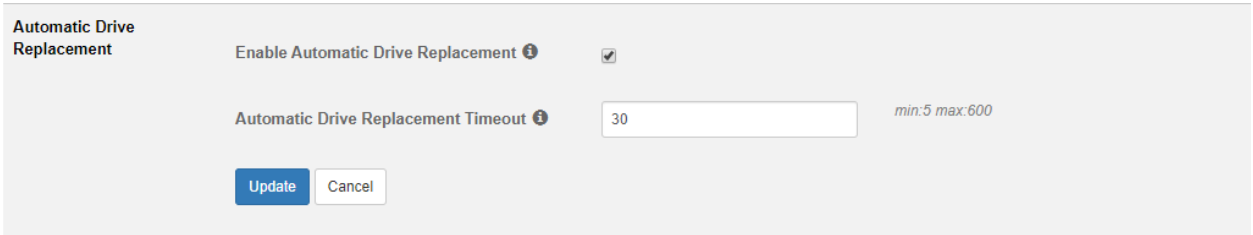
CCVM Engine size

Sets the CCVM configuration in terms of CPU and memory.

Engine size	Number of CPUs	Ram(Gib)
Small	1	2
Medium	2	4
Large	4	8

Automatic drive replacement

Configuration for the cloud automatic drive replacement feature. When Automatic drive replacement is enabled replacement will be triggered for a failed drive reported in any cloud resident VPSA. The Drive replacement will be performed after a user provided monitoring interval. Failed drives will be replace by drives from similar model an similar capacity (given that spares from this drive types exist in the cloud).



Parameter	Description
Enable Automatic Drive Replacement	Is auto replace enabled
Failed drive support ticket time	The time (in minutes) after which replacement will be triggered for a drive presumed to be failed

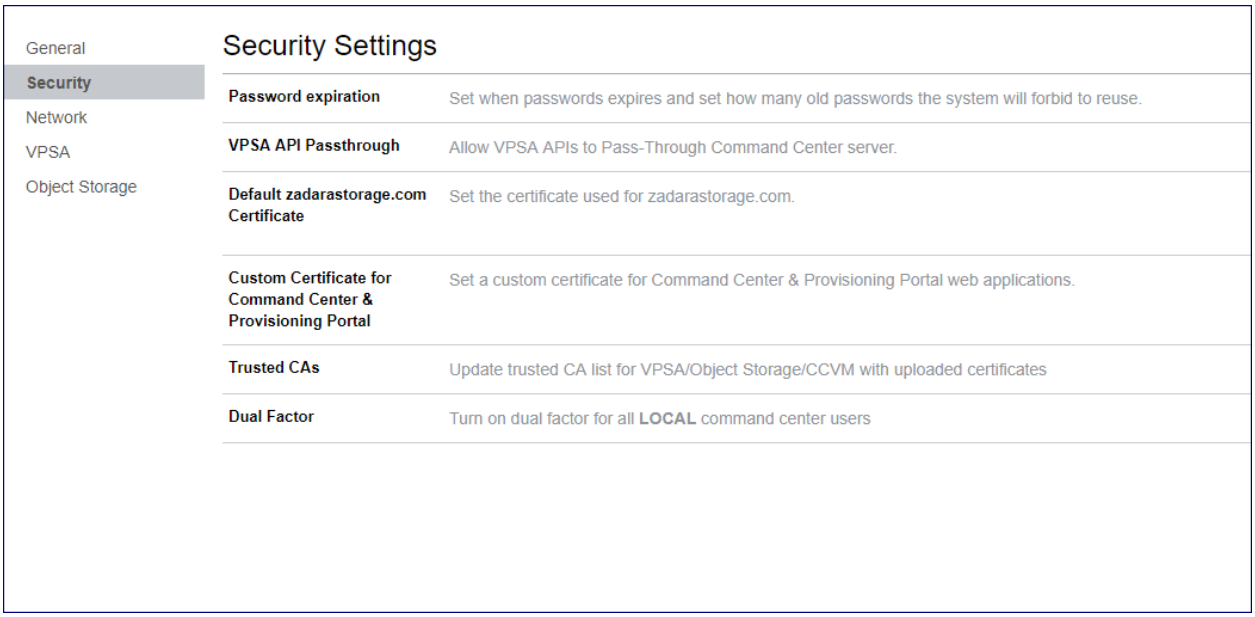
✔ **Note:**

The recommended value for automatic drive replacement timeout is 30 minutes.

Automatic drive replacement will not occur for drives which are members in a RAID group with dedicated hot spare drive defined.

Automatic drive replacement will not occur when more then 4 drives fail at the same time.

15.2 Security Settings



Password expiration

Settings to determine the managed entities password expiration and replacement policy.

Parameter	Description
Enforce Password Expiration	ON - User Password expires and replacement is required after the specified period
Password Expire After	Number of days a certain password is valid
Password history	Number password replacement cycles in which a password cannot be repeated

VPSA API Passthrough

Allows VPSA instances running in the cloud to be managed using Command Center as an API endpoint. This option should be used when an application requires management access to VPSAs from a dedicated network outside of the Zadara cloud.

Custom Certificate for Command Center & Provisioning Portal

Allows replacement of the default certificate used in Command Center and Provisioning Portal by a user provided certificate. Users are required to upload their `.crt` and `.key` files to perform the certificate replacement.

Note:

The provided user certificate must be compatible with NGINX HTTP server.

Trusted CAs

Allows for adding certificate authorities to the VPSACommand Center Trusted CA lists by uploading Certificates signed by them bundled in a `.zip` file.

Dual Factor Turns on dual factor authentication for all local command center users.

15.3 Network Settings

MTU Size

Allows user to increase their Cloud Networks MTU.

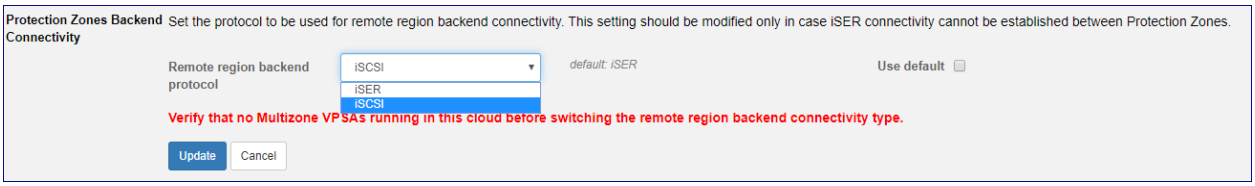
Parameter	Description
FE MTU size	MTU size for the VPSA network (Front-End
Public MTU size	MTU size for the public network

Note:

FE MTU setting effect all custom networks defined in the cloud.

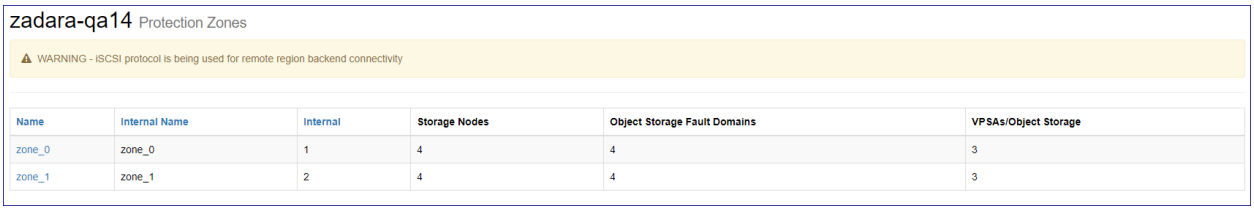
Protection Zones backend connectivity

Allows to configure the use of the iSCSI protocol instead of the iSER protocol in multizone clouds. Protection Zones backend connectivity settings modifies the backend protocol used for inter-zone connectivity **only** (in-zone requests will still use iSER). Inter-Zone Backend connectivity should be switched to iSCSI only in cases where iSER connectivity cannot be established between zones (for example due to the network setup).



To configure iSCSI Inter-Zone Backend connectivity first make sure that no multizone VPSA\Object storage is already configured in the cloud . Set Remote region backend protocol to iSCSI and click on the `Update` button to apply settings.

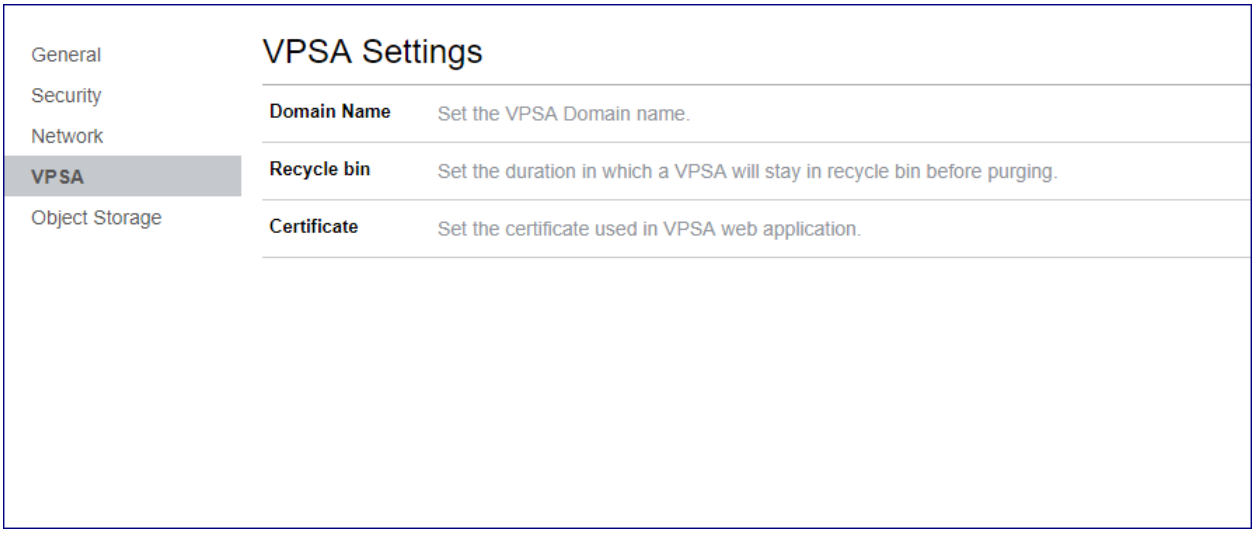
When Remote region backend protocol is set to iSCSI a warning message will be displayed on Command center Protection Zone tab.



Warning:

switching inter-region connectivity protocol to iSCSI might impact VPSA/Object storage performance

15.4 VPSA Settings



Domain name

Sets the domain name to be used for VPSA entities defined on the cloud.

Recycle bin

Sets the period (in days) in which deleted VPSA entities remain in the recycle bin before being purged from the system therefore becoming unrecoverable.

Certificate

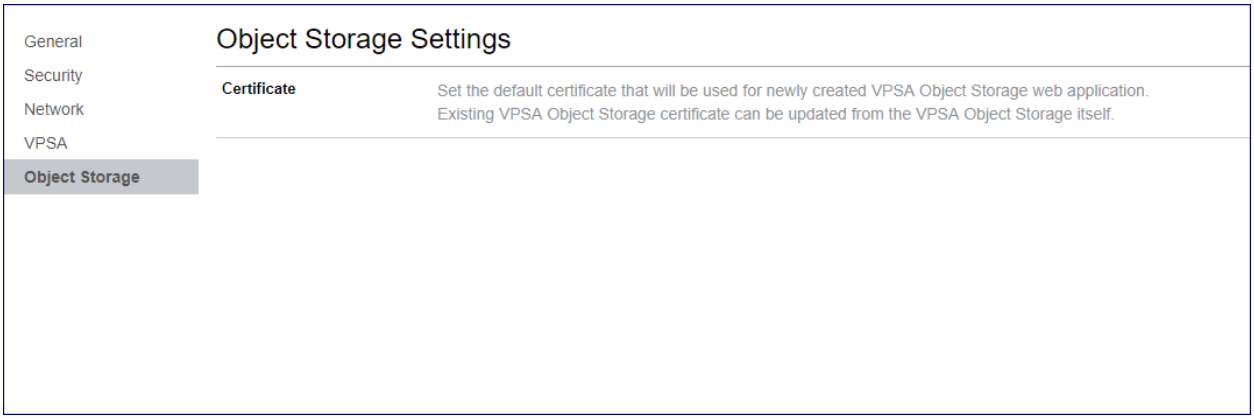
Allows replacement of the default certificate used in VPSA web management application by a user provided certificate. Users are required to upload their `.crt` and `.key` files to perform the certificate replacement.

Note: The provided user certificate must be compatible with NGINX HTTP server.

The default certificate is automatically updated and propagated to existing VPSAs.

The new certificate can be propagated to all existing VPSAs by marking the **Update new certificate on all running VPSAs in the cloud** checkbox, that displays after uploading the new certificate and key files.

15.5 Object Storage Settings



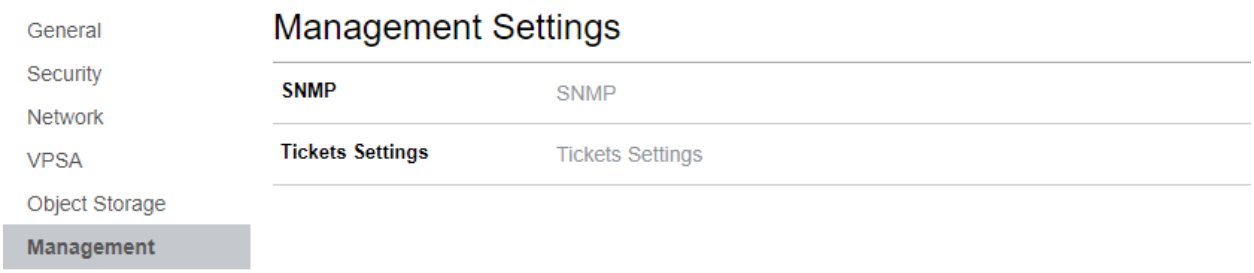
Certificate

Allows replacement of the default certificate used for newly VPSA Object storage web management application by a user provided certificate. Users are required to upload their `.crt` and `.key` files to perform the certificate replacement.

Note:

The provided user certificate must be compatible with NGINX HTTP server.
To replace certificates used in existing VPSA Object storage instances use the VPSA GUI.

15.6 Management Settings



SNMP

The Zadara cloud ecosystem supports Cloud/VPSA/Object Storage administrator level infrastructure monitoring via SNMP Traps. Zadara Cloud SNMP traps are architecture to alert administrator on infrastructure events and are produced in parallel to Zendesk tickets.

SNMP traps can be sent from:

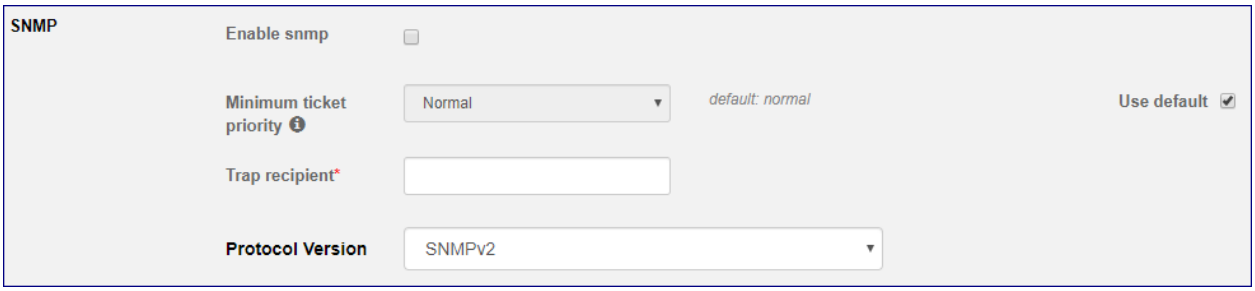
- VPSA
- VPSA Object Storage
- Cloud Storage Nodes
- CCVM

The Zadara cloud SNMP MIB is publicly available for downloading at the following link: https://zadarastorage-software.s3.amazonaws.com/snmp-mib/20.01/ZADARA-MIB.txt

Note:

- The Zadara cloud currently supports a single trap recipient
- SNMP is supported for VPSA/VPSA Object Storage entities in version 20.01 and above
- Storage Node level SNMP traps are not supported for nodes running with trusty kernel

General SNMP Setting

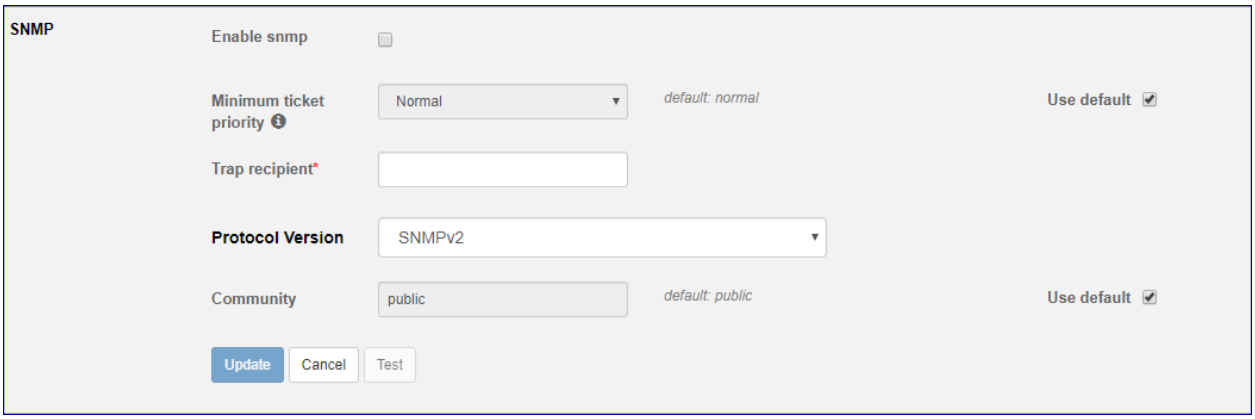


Parameter	Description
Enable SNMP	If checked - SNMP Traps will be sent from all the cloud monitored elements according to the specified configuration
Minimum ticket priority	Minimum priority set for a Zendesk ticket from which an SNMP trap will also be sent
Protocol Version	SNMP version to be used (supported versions are SNMPv2 and SNMPv3)

Note:

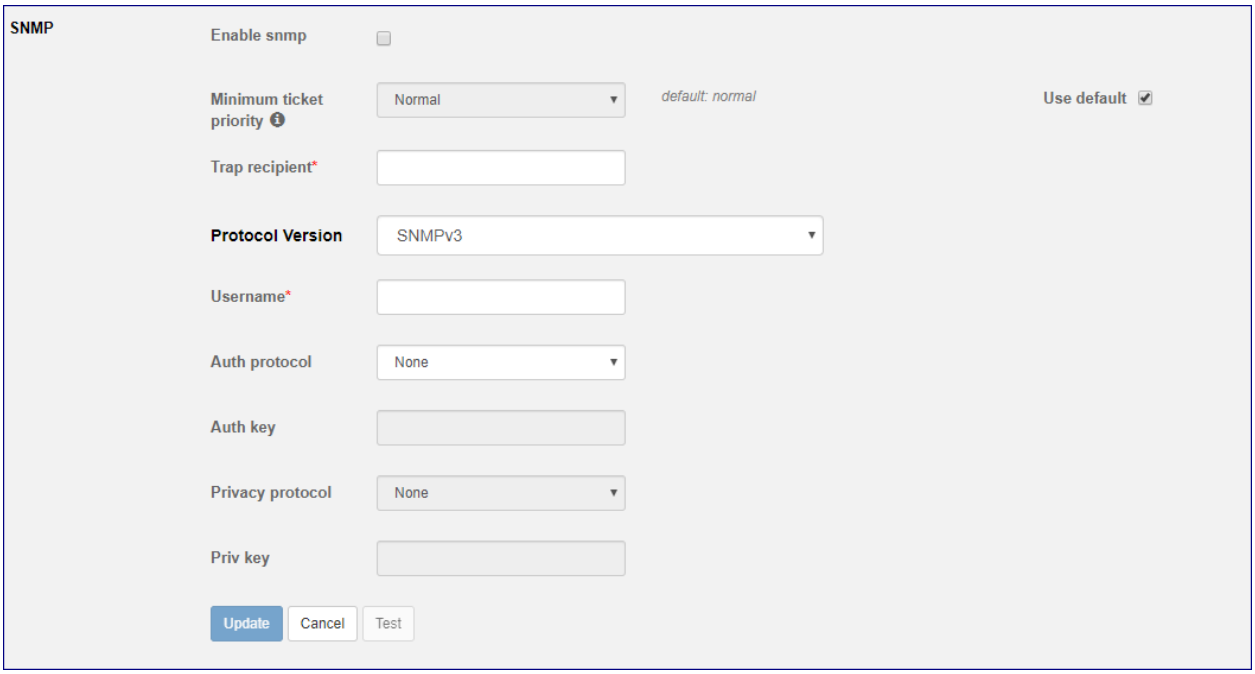
SNMP Traps are not bound to any specific network. The network interface from which SNMP traps will be sent will be determined according to the managed entity routing configuration

Settings for SNMPV2



Parameter	Description
Community	SNMPv2 trap community to be used

Settings for SNMPV3



Parameter	Description
Username	SNMPV3 username for sending traps
Minimum ticket priority	Minimum priority set for a Zendesk ticket from which an SNMP trap will also be sent
Auth Protocol	SNMPv3 Authentication protocol to use. Supported protocols are: none, MD5, SHA-1, SHA-2-224, SHA-2-256, SHA-2-384 and SHA-2-512.
Auth key	SNMPv3 authentication password (valid of Auth protocol is set to any value but none). Minimum Auth key lengths is 8 characters.
Privacy Protocol	SNMPv3 privacy(encryption) protocol to use. Supported protocols are: none, AES128 , AES192, AES256 and DES
Priv key	SNMPv3 privacy(encryption) key (valid of privacy protocol is set to any value but none) Minimum. Priv key lengths is 8 characters.

Note:

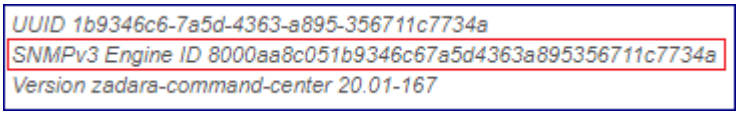
SNMPv3 supported modes of operations are : NoAuthNoPriv, AuthNoPriv, AuthPriv

Testing SNMP Settings Cloud Administrator can test and validate their SNMP settings prior to applying then by sending a test trap. Test traps are produced by clicking on the `Test` button on the SNMP settings dialog, Test traps are produced and transmitted according to the specified settings.

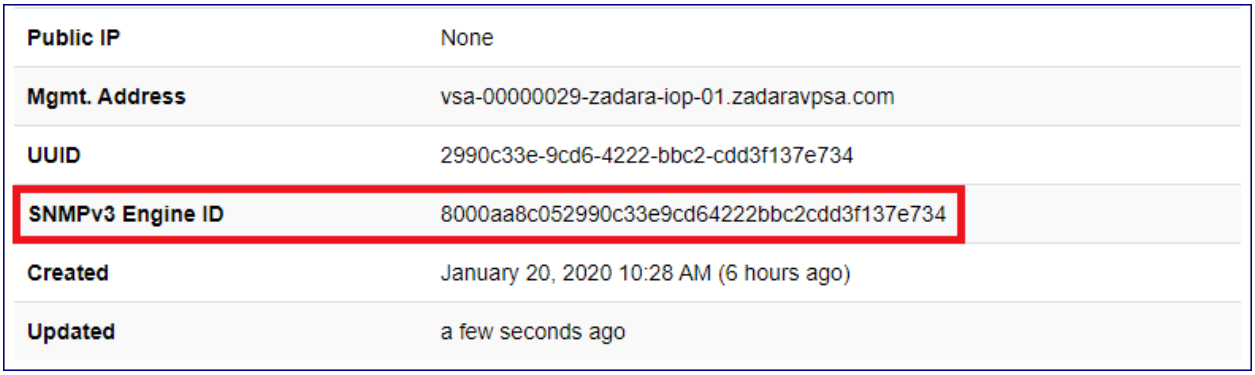
Working with SNMPv3 Engine IDs Sending and receiving SNMPv3 Traps requires the usage of a managed element identifier known as SNMP Engine ID. Each managed element engine ID should be configured in the SNMP trap recipient to allow receival of traps from this entity. The Zadara cloud defines a different engine ID for :

- The Zadara Cloud infrastructure(All Storage Node and the Cloud Controller VM)
- Each VPSA/VPSA Object Storage entity

The Engine ID for the Zadara Cloud infrastructure is specified on the bottom right corner of the screen.



The Engine ID for a VPSA/VPSA object Storage entity is specified in the entities property tab.



Note:

for VPSA/VPSA Object storage entities with versions lower then 20.01 - SNMPv3 Engine ID will not be displayed.

Ticket Settings

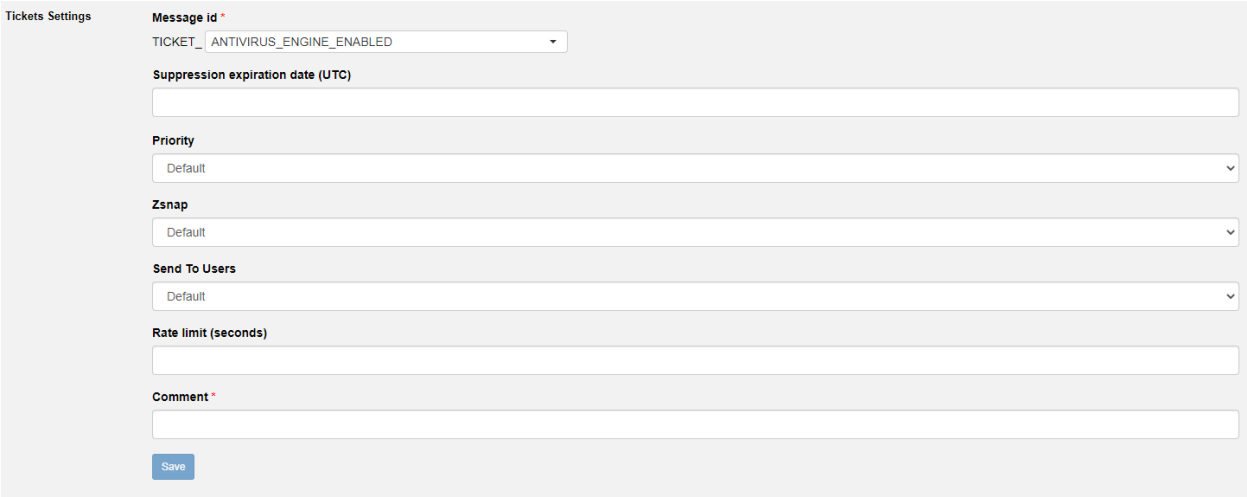
The Ticket Settings Section allows the cloud administrator to override the default attributes of the cloud infrastructure support tickets.

Ticket attributes can be configured in 2 different scopes:

- Cloud level scope - performed from Command Center Settings management section
- VPSA/VPSA Object Storage scope - performed from the virtual array settings tab

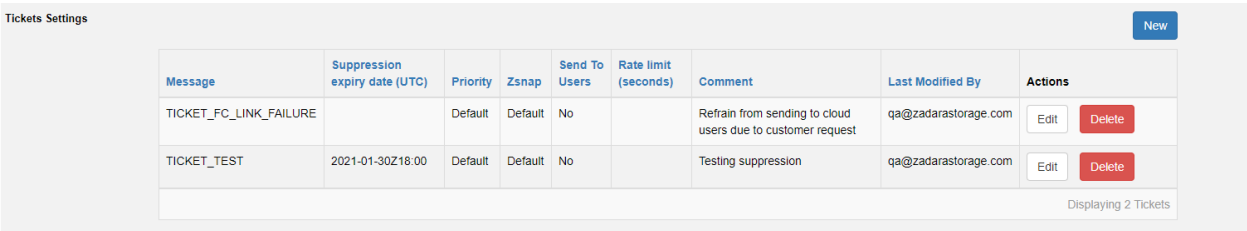
Note:

In case of conflict between global and VPSA/VPSA Object Storage ticket settings
VPSA/VPSA Object storage setting are applied for tickets produced by the virtual array.



Parameter	Description
Message ID	The Message Id of the ticket to be configured
Suppression expiration date (UTC)	Sets a ticket as suppressed until a given timestamp. Suppressed will not be sent into zendesk from this particular cloud
Zsnap	allows the user to configure weather a Zsnap will be created when this ticket is produced and what type of Zsnap will be created (full/light)
Send To Users	indicates weather tickets for the specific message id will be sent to cloud users that have enabled notifications.
rate limit(seconds)	The interval from the time a specific ticket is produced to the time in which another ticket with the same message id and concerning the monitored element can be produced again
comment	User Filled Comment explaining the reason for this attributes change

After creation of a custom ticket rule the initial dialog of the ticket settings section will be modified to display the rules currently applied on this cloud.



Existing rules can also be edited or deleted by clicking on the appropriate button in the Actions column.

Note:

The cloud level ticket rules display does not provide any visibility of rules defined in a single VPSA or VPSA Object Storage
Scope and vice versa.

CHAPTER

SIXTEEN

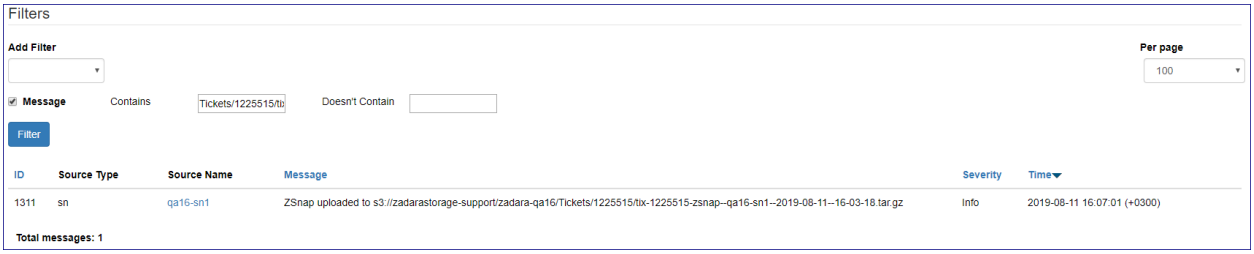
MANAGING CLOUD LOGS

Command Center maintains a centralized cloud level event log which can be utilized for detailed infrastructure monitoring and troubleshooting. Log event can be viewed and searched from the Command Center Central Log tab. Events may also be shipped to an external syslog daemon for 3rd party application based event monitoring.

16.1 Searching And Filtering Logs

Cloud log can be searched and specific events extracted using the Command Center filtering functionality. To search for specific content in log messages:

On the Central Log tab select **Message** in the **Add Filter** list box. Type a search string in **Contains** or an exclude string in **Doesn't Contain** and Click on the `Filter` button



Additional filters can be applied can be applied by selecting more statements in the **Add Filter** list box.

Users can filter log messages by:

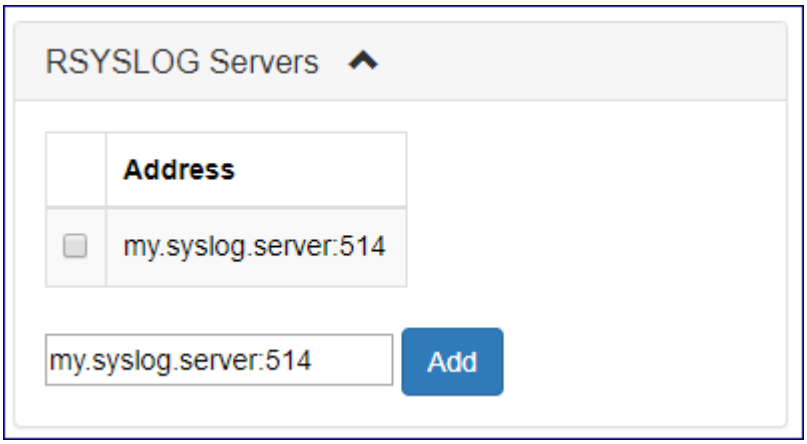
Statement	Description
Message	Search\exclude string
Created	Event creation date range
Min Severity	Minimum severity level
Source Type	Element in which event occurred (Storage Node, VPSA, etc.)
Source Name	Selection\exclusion of a specific element

✔ **Note:** Filter statements have a "logical and" relationship between them

16.2 Forwarding Events To A Syslog Daemon

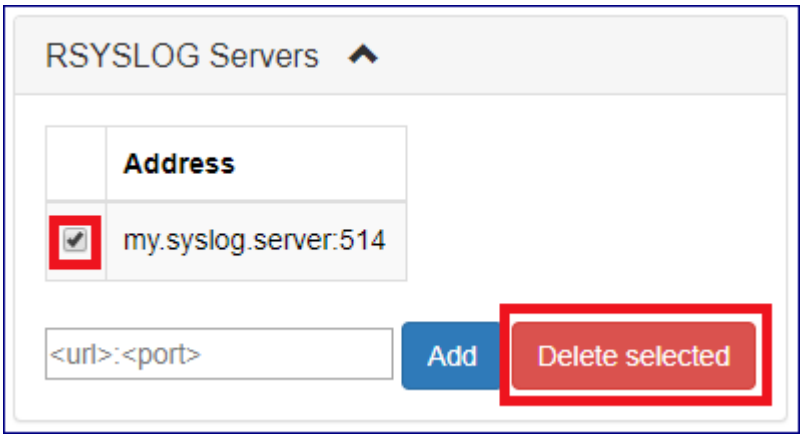
To forward cloud events events to an external syslog daemon:

On the Central Log tab select click on the **RSYSLOG Servers** caption. In the text box below type your syslog server IP address and the syslog daemon port number separated by **":"** . Click on the **Add** button to apply changes.



To stop forwarding cloud events events to a defined syslog daemon:

On the Central Log tab select click on the **RSYSLOG Servers** caption. Select the checkbox for the specific syslog daemon server you would like to remove and click the **Delete selected** button.



16.3 Managing Command Center Access Log

To view command center access log click on the icon on the top right side of the screen and select Access logs from the drop down menu.

Access log messages can be filtered in a similar way as with cloud central logs.

Available filter statements are :

Statement	Description
Action	Command center Action performed or attempted
Access Type	Web or API access
IP Address	Originating IP address
User	Originating User ID
Created	Log record creation date

CHAPTER

SEVENTEEN

USING COMMENTS IN COMMAND CENTER

17.1 Understanding Command Center Comments

Command center allows cloud administrators to attach comments to most of the cloud managed entities. Comments can be used to document any issue or business process conducted in the cloud for example communicate resource (storage nodes or parts of it , disk drives etc.) dedication to a specific project/tenant.

Command center comments can be assigned to the following Zadara could entities:

- Storage nodes
- VPSA/VPSA object storage
- Cloud users
- Disk drive series/Individual disk drives

Comments as assigned with a severity level, supported levels are : low , medium ,high and critical. An indication of all cloud comments according to their severity is displayed on Command centers main dashboard.

All comments created in command center can be displayed by clicking on the comment section on command centers main dashboard.

Note:

Command center comments support standard GitHub markdown

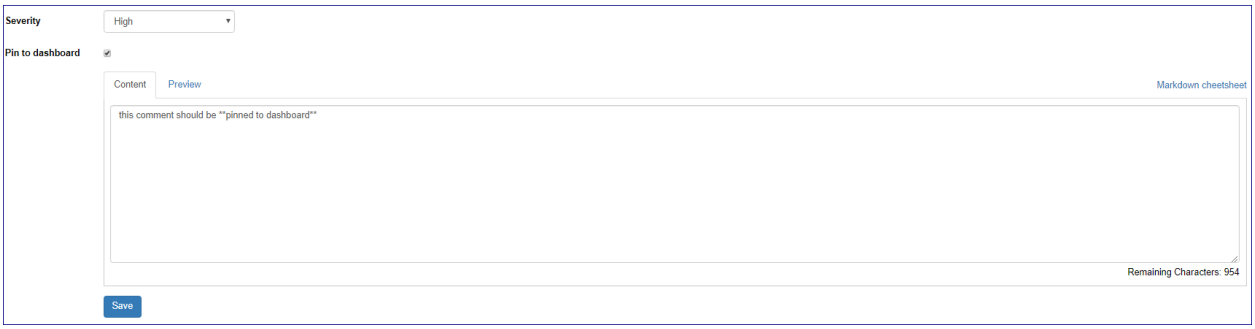
Comments for zadara-iop-01

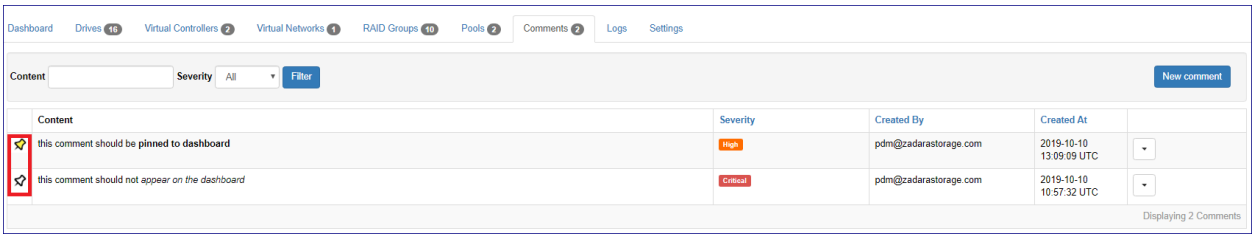
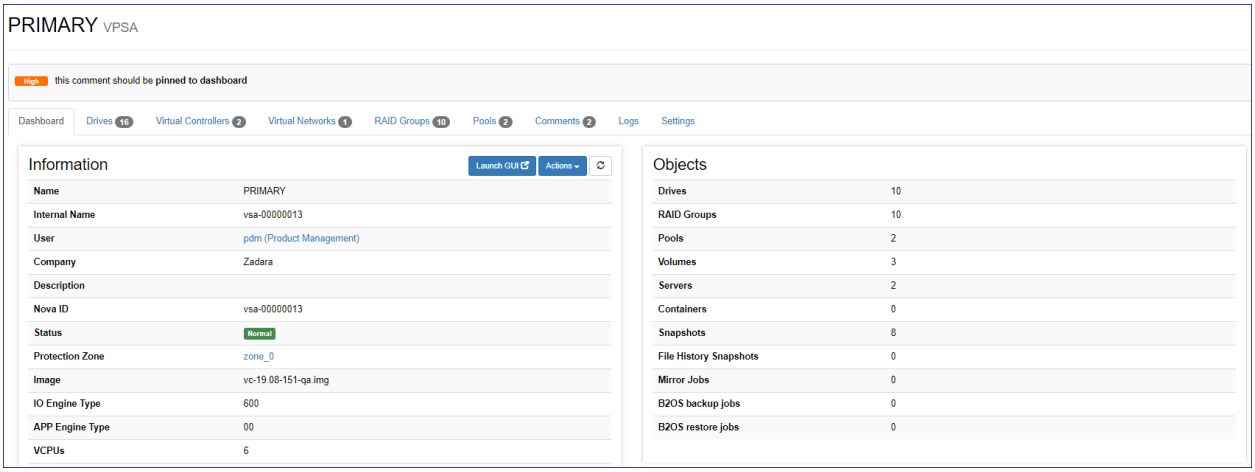
Type	Name	Content	severity	created_by	created_at	
Vpsa	PRIMARY	this comment has a `code block` in it.	Critical	pdm@zadarastorage.com	2019-10-10 11:59:31 UTC	
Node	zdr-iop-sn-01	this comments contains several items: • this is the first item • this is the second item	Critical	pdm@zadarastorage.com	2019-10-10 11:56:47 UTC	
Vpsa	PRIMARY	test markdown **comment** with **highlight**	Critical	pdm@zadarastorage.com	2019-10-10 10:57:32 UTC	
Zios	ZOBS	test comment with `markdown`	High	pdm@zadarastorage.com	2019-10-10 10:37:01 UTC	
Drive Type	SSD CACHE DRIVES	this comment has a logo embedded in it	Medium	pdm@zadarastorage.com	2019-10-10 11:38:13 UTC	
Drive Type	SAS 5588GB 7200RPM	markdown H2 title this is an embedded hyper link to Serial Attached SCSI wikipedia definition	Medium	pdm@zadarastorage.com	2019-10-10 11:12:27 UTC	
Zios	ZOBS	*this is another test comment with markdown*	Low	pdm@zadarastorage.com	2019-10-10 11:08:46 UTC	

Displaying 7 Comments

17.2 Working With Comments

To add a new comment to a supported command center entity navigate to its dashboard and click on the comments tab and then on the `New Comment` button. Assign a severity to your comment ,add the required content and tick the Pin to dashboard box if you want this specific comment text to be displayed on the elements dashboard. Click on the `Save` button to create the new comment.



Note:

Comments can be pinned\unpinned from the elements dashboard by clicking on the comments pin icon on the elements Comments tab