

zVirtuozzo

Virtuozzo PowerPanel

Administrator's Guide

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CHAPTER 1

About Virtuozzo PowerPanel

Virtuozzo PowerPanel is a solution for service providers that allows their customers to independently manage purchased virtual environments hosted on Virtuozzo 7 nodes. Virtuozzo PowerPanel eliminates the need for service providers to develop their own VPS management portals, helping them save resources and focus on their primary goals.

In terms of architecture, Virtuozzo PowerPanel consists of a single controller node and multiple Virtuozzo 7 compute nodes. The controller node runs the database, identity provider, API, VNC proxy, web server, and other required services while each compute node runs a compute service that interacts with Virtuozzo 7.

Virtuozzo PowerPanel typically integrates with service provider's identity database via LDAP. However, the service provider may also choose to create users locally on the controller node.

Virtuozzo PowerPanel has two modes: admin and user. The admin mode provides means to manage assignment of virtual environments to users while the user mode offers virtual environment management tools. The administrator logged in the admin mode can also switch to the user mode and back for complete control over virtual environments and their assignments.

The next chapter explains how to log in to Virtuozzo PowerPanel and perform administration tasks.

CHAPTER 2

Installing Virtuozzo PowerPanel

To install PowerPanel, you need to deploy one controller (management) node and after that as many compute nodes as required. The following sections describe these procedures in detail.

Note: Installation is performed by means of Ansible playbooks.

The following requirements that must be met to install Virtuozzo PowerPanel:

1. The controller can be deployed on a physical host, in a virtual machine or container running Virtuozzo Linux 7 or CentOS 7.
2. The controller's physical or virtual environment must have at least 2 CPU cores and 8GB of RAM.
3. The compute component can be installed on a Virtuozzo 7 host.
4. Operating systems on the controller and all compute nodes must be fully updated.
5. Each node in the PowerPanel cluster—the controller and all computes—must have a fully qualified domain name (FQDN) and be accessible by it.
6. Time must be synchronized on the controller and all compute nodes. For example, by running on each node `yum install ntpdate && ntpdate pool.ntp.org`.

2.1 Deploying the Controller

Note: If you need to change certificates used in deployment (e.g., replace self-signed ones with those from a trusted CA) or change controller hostname, rerun the `vzapi-installer controller` command with the new parameters. To change the controller hostname while keeping the same self-signed certificates, use the `--force-cert-gen` parameter.

To deploy the controller, do the following on the host chosen to be the controller:

1. (CentOS 7 only) Disable SELinux. To do this, set `SELINUX=disabled` in `/etc/sysconfig/selinux` file and reboot the system.

2. (CentOS 7 only) Import the key Virtuozzo PowerPanel packages are signed with:

```
# rpm --import https://docs.virtuozzo.com/keys/VIRTUOZZO_GPG_KEY
```

3. Install the `pp-release` package. It will add the repository with PowerPanel packages.

```
# yum install http://repo.virtuozzo.com/pp/releases/2.0/x86_64/os/Packages/p/\
pp-release-2.0-4.v17.noarch.rpm
```

4. Install the `vzapi-installer` package. It will provide the Ansible playbooks necessary to deploy PowerPanel and the `vzapi-installer` script that automates said deployment.

```
# yum install vzapi-installer
```

5. Launch the deployment script. A self-signed certificate is generated and used by default, however, you are recommended to use your own certificate, private key, and certificate authority (CA) files. If you have one or more intermediate certificates, you can specify them as well to indicate a chain of trust. Every intermediate certificate will be handled by `openssl verify` as untrusted. The deployment script will automatically concatenate the certificates and use the resulting file during installation. The original CA file will be added to `httpd` configs.

- If you have an SSL certificate and key from a third-party trusted CA, run the deployment script as follows:

```
# vzapi-installer controller --ask-passwd --private-ip <IP_address> \
--ssl-ca-file <path_to_file> --ssl-cert-file <path_to_file> \
--ssl-key-file <path_to_file>
```

- If you have your own CA file that you used to generate an SSL key and a certificate that requires intermediate certificates for resolution, run the deployment script as follows:

```
# vzapi-installer controller --ask-passwd --private-ip <IP_address> \  
--ssl-ca-file <path_to_file> --ssl-cert-file <path_to_file> \  
--ssl-key-file <path_to_file> --ssl-intermediate-cert <path_to_file> \  
[--ssl-intermediate-cert <path_to_file> ...]
```

- If you want to deploy with a generated self-signed certificate, run the deployment script as follows:

```
# vzapi-installer controller --ask-passwd --private-ip <IP_address>
```

The `--private-ip <IP_address>` is the required parameter that sets the IP address of the network interface that the controller will use to communicate with compute nodes. Controller services used for internal communication will listen only on this network interface. This can be useful if you have a private network for the controller and compute nodes and do not want controller services to be accessible from other networks.

During setup, you will be asked to provide the administrator's password that will be required to log in to PowerPanel in the admin mode. If you need to specify the password in the command line, you can replace `--ask-passwd` with `-p <admin_passwd>`.

Note: Once set, the administrator's password is stored in the file `/var/lib/vzapi-installer/group_vars/all` alongside with automatically generated passwords for other services used by PowerPanel.

If you have a firewall enabled, the deploy script will create rules to open the required ports (see [Appendix A: Controller and Compute Ports](#) on page 22).

When deployment is completed successfully, you will see a recap from Ansible and information on how to access Virtuozzo PowerPanel web interface. For example:

```
PLAY RECAP *****  
ctrl.example.com      : ok=57  changed=49  unreachable=0  failed=0  
  
Controller has been deployed successfully!  
  
Virtuozzo PowerPanel web UI can be accessed at https://ctrl.example.com  
with this username/password: admin/password
```

6. If you used a self-signed certificate generated during deployment, import its file `/var/lib/vzapi/vzapi_rootCA.crt` into the browser in which you will open Virtuozzo PowerPanel web interface.

If you later need to redeploy or update the controller without changing the administrator's password, skip password-related options and run

2.2. Deploying Compute Nodes

```
# vzapi-installer controller
```

Note: By default, each user is allowed to create 3 backups of each of their VEs. Any changes to this backup limit are applied only to VEs added to the Virtuozzo PowerPanel infrastructure after the change. If you need to change the default backup limit from the start, do so before deploying the compute nodes. For instructions, see [Setting Backup Limit for Virtual Environments](#) on page 20.

2.2 Deploying Compute Nodes

To deploy compute nodes, that is, make your Virtuozzo nodes manageable by the controller, do the following on the controller node:

1. Create a file, e.g. `nodes.lst`, with a list of Virtuozzo nodes to be attached to the cluster. Specify each node, one per line, in the form `<user>:<password>@<node_hostname>`.

Important: Hostnames are case-sensitive.

For example:

```
root:passwd1@vz_hostname1  
root:passwd2@vz_hostname2
```

Use root credentials because deployment involves package installation, service setup, and other actions that require root privileges.

Note: Keep this file if you plan to add more compute nodes later. For details, see [Adding Compute Nodes](#) on page 6.

2. Set the required owner and file permissions to the nodes list file:

```
# chown root nodes.lst  
# chmod 600 nodes.lst
```

3. Run the deploy script:

```
# vzapi-installer computes --nodes=nodes.lst
```

The `vzapi-installer` script will place SSH keys stored in `/var/lib/vzapi` on each node in the list and launch `ansible-playbook` to perform actual deployment.

Note:

1. Once the compute component is deployed on a node, that node's name is added to the **computes** section of the file `/var/lib/vzapi-installer/inventory`.
2. Virtuozzo does not have the firewall enabled by default. If, however, you have configured and started a firewall manually on a compute node, create rules to open the required ports on that compute node (see [Appendix A: Controller and Compute Ports](#) on page 22).

When deployment is completed successfully, you will see a recap from Ansible. For example:

```
PLAY RECAP *****
compute1.example.com      : ok=15  changed=9  unreachable=0  failed=0
<...>
compute10.example.com    : ok=15  changed=8  unreachable=0  failed=0

Compute nodes have been deployed successfully!
```

If you later need to redeploy existing compute nodes listed in your `nodes.1st` file or update PowerPanel components on them, run

```
# vzapi-installer computes
```

2.2.1 Adding Compute Nodes

To add more compute nodes after installation, specify their information in `nodes.1st` in addition to compute nodes already deployed and run the deploy script:

```
# vzapi-installer computes --nodes=nodes.1st
```

Important: If invoked with the `--nodes=nodes.1st` option, the deploy script will only deploy compute nodes specified in `nodes.1st` and remove from Ansible configuration files all existing compute nodes that are not listed in this file. For information on how to remove a compute node from Virtuozzo PowerPanel completely, see [Removing Compute Nodes](#) on page 7.

2.3. Post-Installation Tasks

2.2.2 Removing Compute Nodes

To remove a deployed compute node from Virtuozzo PowerPanel, do the following:

1. Stop and disable the `vzapi-compute` service:

```
# systemctl stop vzapi-compute
# systemctl disable vzapi-compute
```

2. Remove the `vzapi-compute` package:

```
# yum remove vzapi-compute
```

3. Remove information on the compute node and its VEs from the Virtuozzo PowerPanel database.

- 3.1. On the controller node, find out the ID of the node to delete by means of the `vzapi host list` command. For example:

```
# vzapi host list
<...>
{
  "created_at": "2017-03-06T12:18:27.000000",
  "hostname": "compute4.example.com",
  "id": "6ddb2c1632a42ce9d2d8a83a7c93e04"
},
<...>
```

- 3.2. With the compute node ID, delete information about the node and all its VEs from the Virtuozzo PowerPanel database. For example:

```
# vzapi host delete 6ddb2c1632a42ce9d2d8a83a7c93e04
```

Note: If you remove host information from the database without stopping and removing the `vzapi-compute` service, said information will be restored in the database on next `vzapi-compute` restart.

2.3 Post-Installation Tasks

After installing Virtuozzo PowerPanel, the administrator needs to set up a user database on the controller node in one of these ways:

- integrate an LDAP database with Virtuozzo PowerPanel (see *Integrating Virtuozzo PowerPanel with a LDAP*)

Database on page 9), or

- create users locally on the controller node (see *Managing Users Locally* on page 12).

2.4 Upgrading Virtuozzo PowerPanel

Note: Virtuozzo PowerPanel services may need to be stopped and restarted during upgrade, resulting in a certain downtime.

Virtuozzo PowerPanel can be upgraded to a new version with the following commands:

```
# yum update vzapi-installer
# vzapi-installer upgrade <upgrade_package>
```

Where `<upgrade_package>` is the URL of a specific `pp-release` package that installs a repository for a specific upgrade. The URL becomes available when an upgrade is released.

The upgrade process requires no other interaction from the administrator. All the necessary changes are automatically made to both the controller and all computes.

CHAPTER 3

Setting Up User Database

3.1 Integrating Virtuozzo PowerPanel with a LDAP Database

This chapter describes how to integrate the Virtuozzo PowerPanel controller with an existing LDAP database (on the example of OpenLDAP).

Note: If your LDAP setup differs from this example, more configuration details are available [here](#).

The following prerequisites need to be met prior to LDAP setup:

1. Virtuozzo PowerPanel must be deployed.
2. For remote LDAP, firewall must be disabled or necessary rules must be added.

To set up LDAP, do the following:

1. Decide on how to map LDAP attributes to Keystone user names and IDs. For example, assign names to the `sn` parameters, IDs to `cn` parameters.
2. In your LDAP database, create the `vzapi` and `admin` users.

- 2.1. Find out the IDs and names of users `admin` and `vzapi` in the Keystone database on the controller.

For example:

```
# openstack --os-cloud local user show admin
<...>
| id                | 86921a8ec6a5497895ca07c5d6b738af |
<...>
```

```
# openstack --os-cloud local user show vzapi
<...>
| id                | d8e4a93d60954c92b4239981c6c40707 |
<...>
```

- 2.2. Generate password hashes for the users `admin` and `vzapi`:

```
# slappasswd
New password:
Re-enter new password:
{SSHA}E2qhe244kX8r+stF0b6mX2bfHYSpygTk
# slappasswd
New password:
Re-enter new password:
{SSHA}wBjzhGnmH13hT9mZja9GLyt0XBU4qHcS
```

- 2.3. Create the file `users.ldif` with the contents shown further. Specify the IDs of users `admin` and `vzapi` in the `cn` parameters, their password hashes in the `userPassword` parameters, and your domain name in the `dc` parameters. For example:

```
dn: cn=d8e4a93d60954c92b4239981c6c40707,ou=<PP_users_OU>,dc=ctrl,dc=example,dc=com
objectClass: person
cn: d8e4a93d60954c92b4239981c6c40707
sn: vzapi
userPassword: {SSHA}E2qhe244kX8r+stF0b6mX2bfHYSpygTk

dn: cn=86921a8ec6a5497895ca07c5d6b738af,ou=<PP_users_OU>,dc=ctrl,dc=example,dc=com
objectClass: person
cn: 86921a8ec6a5497895ca07c5d6b738af
sn: admin
userPassword: {SSHA}wBjzhGnmH13hT9mZja9GLyt0XBU4qHcS
```

Where `<PP_users_OU>` is the organizational unit with the list of users that need to be available in Virtuozzo PowerPanel.

- 2.4. Add the corresponding entry to the LDAP database:

```
# ldapadd -x -D cn=Manager,dc=ctrl,dc=example,dc=com -W -f users.ldif
Enter LDAP Password:
adding new entry "cn=d8e4a93d60954c92b4239981c6c40707,ou=<PP_users_OU>,dc=ctrl<...>"
adding new entry "cn=86921a8ec6a5497895ca07c5d6b738af,ou=<PP_users_OU>,dc=ctrl<...>"
```

- 2.5. Specify the password (not hash) of the user `vzapi` in the file `/etc/vzapi/vzapi.conf` on the controller:

```
[keystone_authtoken]
password = <vzapi_password>
```

3. On the controller node, edit `/etc/keystone/keystone.conf` according to your needs. You may need to do the following:

3.1. Integrating Virtuozzo PowerPanel with a LDAP Database

3.1. Specify LDAP server information. For example:

```
[ldap]
url = ldap://<ldap_server_address>
user = cn=Manager,dc=ctrl,dc=example,dc=com
password = <ldap_admin_password>
suffix = dc=ctrl,dc=example,dc=com
```

3.2. Specify the organizational units (OU) in the LDAP directory with information about users that will be managed in Virtuozzo PowerPanel. For example:

```
[ldap]
user_tree_dn = ou=<PP_users_OU>,dc=ctrl,dc=example,dc=com
user_objectclass = person
```

3.3. Switch to the LDAP identity driver:

```
[identity]
#driver = sql
driver = ldap
```

4. On the controller node, restart the Apache HTTP Server:

```
# systemctl restart httpd
```

5. On the controller node, create Keystone projects with names that match corresponding user names:

```
# vzapi user sync
```

This command needs to be run after creating or deleting users. It does not need to be run after editing user attributes or changing their passwords.

6. On the controller node, make sure that Keystone sees LDAP users:

```
# openstack --os-cloud local user list
```

7. On the controller node, make sure that a project has been created for each user on step 5:

```
# openstack --os-cloud local project list
```

You should see a list of projects with names that match corresponding user names.

3.2 Managing Users Locally

3.2.1 Creating Users Locally

If no identity provider is available to obtain user information from, an administrator with access to the controller's console can create users locally on the controller node. Created users appear in the PowerPanel web interface after creation and can be assigned virtual environments.

Note:

1. You cannot create LDAP users with `vzapi user create`.
2. If you switch to LDAP, existing local users will not be available in Virtuozzo PowerPanel anymore. They will, however, remain in the local identity database.

To create a user, run the command `vzapi user create <username>` on the controller node. You will also be asked to create the user's password. For example:

```
# vzapi user create user1
Password:
Confirm:
```

To make sure that the user has been created, you can run the command `openstack --os-cloud local user list`. For example:

```
# openstack --os-cloud local user show user1
+-----+-----+
| Field          | Value                               |
+-----+-----+
| domain_id     | default                             |
| id            | 315a8d0ee4d84474bd8c8c0574e9e987   |
| name          | user1                               |
| password_expires_at | None                               |
+-----+-----+
```

3.2.2 Changing Passwords of Local Users

To change the password of a user created locally, run the command `openstack --os-cloud=local user set <username> --password <new_passwd>`. For example:

```
# openstack --os-cloud=local user set user1 --password newpassword
```


3.2. Managing Users Locally

3.2.3 Deleting Local Users

To delete a user created locally, run the command `vzapi user delete <username>`. For example:

```
# vzapi user delete user1
```

CHAPTER 4

Performing Administration Tasks

The main purpose of the admin mode is to provide an easy way for an administrator to assign virtual environments (VEs) hosted on compute nodes to end users from an identity provider, e.g., LDAP database. If such an identity provider is not available, users can be created locally on the controller node (see *Managing Users Locally* on page 12).

After having been assigned a VE, an end user can log in to Virtuozzo PowerPanel with the username and password set for the VE and manage it in the user mode.

4.1 Logging In to Virtuozzo PowerPanel

To log in to the Virtuozzo PowerPanel web interface, visit controller node's hostname or IP address in a supported web browser.

Note:

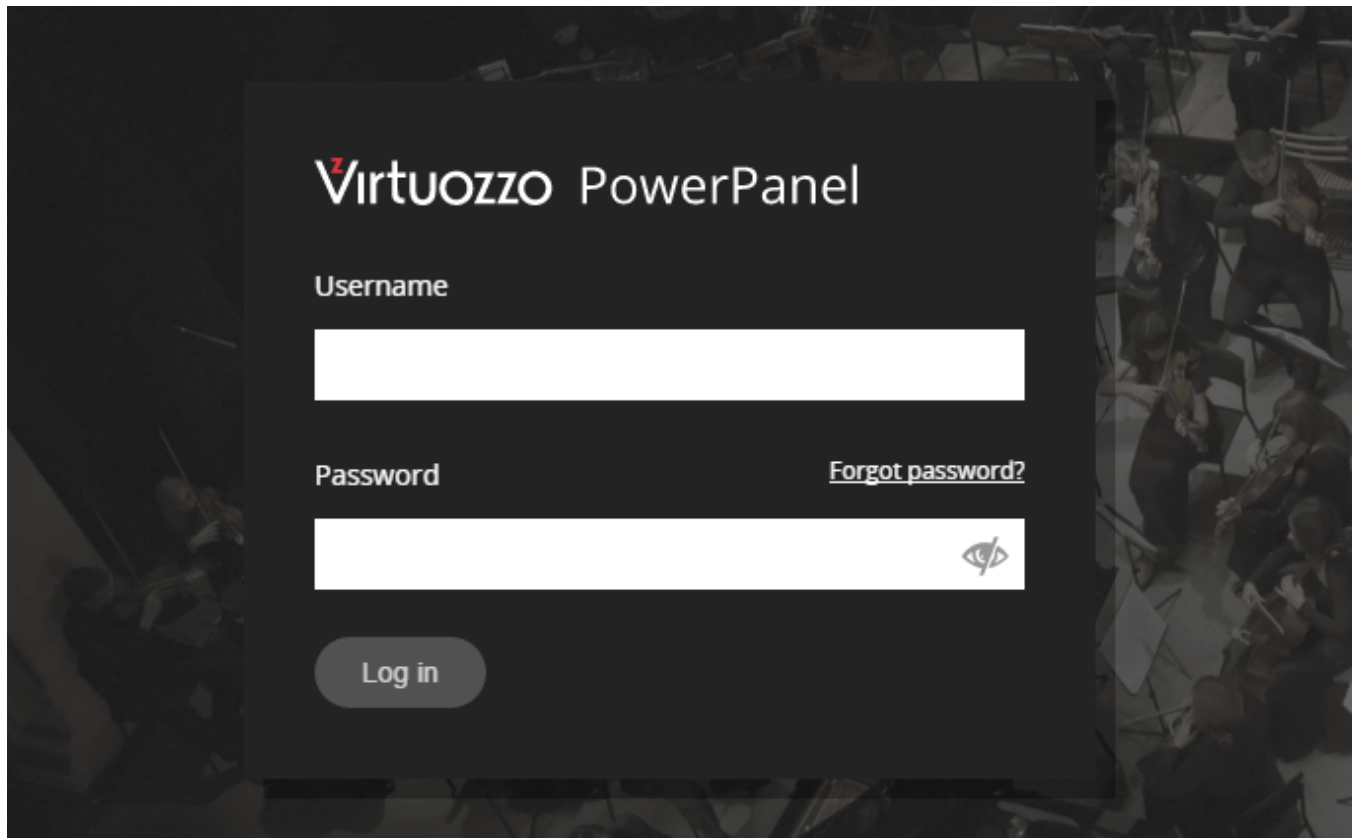
1. The latest versions of all popular web browsers are supported: Chrome, Firefox, Edge, Opera, Safari.
2. Regular users can also log in to manage single VEs via an old-style welcome screen accessible at https://<controller_hostname>/login/ve. For details, see the [Virtuozzo PowerPanel User's Guide](#).

If you deployed the controller with a self-signed certificate, accept it when prompted and add it to browser's exceptions.

4.1. Logging In to Virtuozzo PowerPanel

Note: Some browsers, e.g., Firefox, require exceptions to be added in the form of `<controller_address>:<port>` for ports 6556, 6557, and 35357.

You will be taken to the welcome screen where you will need to enter the username `admin` and the password created during controller setup (see *Deploying the Controller* on page 3).



After logging in, you will be taken to the main screen of Virtuozzo PowerPanel.

Note: At any time, you can click the Virtuozzo PowerPanel logo in the top left corner to return to the main screen.

Virtuozzo PowerPanel

Virtual Environments

Assign Unassign Search

<input type="checkbox"/>	VE Name	UUID	IP Address	Host
Unassigned				
<input type="checkbox"/>	ct1	0f29802f-6392-4552-b46c-1e80761fca4f	172.16.24.225	dhcp-10-30-17-112.sw.ru
<input type="checkbox"/>	authorit	4fc2d95e-8cd5-44bc-8497-9dd3e0d12396	Not configured	dhcp-10-30-17-112.sw.ru
<input type="checkbox"/>	cl_ac3	8c70b3a2-1a32-4917-91d1-7d8a11a3f7c4	Not configured	dhcp-10-30-17-112.sw.ru
<input type="checkbox"/>	cl_ac4	15b23b2b-60eb-4f3d-a256-60c14db5e7f5	Not configured	dhcp-10-30-17-112.sw.ru
<input type="checkbox"/>	vm1	112beb4c-9fa1-4e24-8c0f-e78fead5082c	Not configured	doc-pp2-compute1.sw.ru
Show 3 more virtual environments				
Admin				
<input type="checkbox"/>	cl_ac1	0511e8d8-f51d-4e43-8cac-930b0b4d8c8f	Not configured	dhcp-10-30-17-112.sw.ru
<input type="checkbox"/>	cl_ac2	464cef81-d9ba-481e-be66-54e135906fba	Not configured	dhcp-10-30-17-112.sw.ru
User2				

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On the main screen, you can see the list of virtual environments hosted on all compute nodes. The VEs in the list are divided into groups based on what user they are assigned to, if any: **Unassigned**, **Admin**, and **<username>**.

Each VE area in the list expands on click, showing more details about the VE, including state, type, UUID, name, IP address (the one assigned with `pr1ct1`, not the one obtained from inside the guest OS), virtual hardware configuration, backups, and logs. In the VE area, you can also see the buttons for tasks available for this specific VE.

4.2. Managing Virtual Environment Assignments

The screenshot displays the details for a virtual environment (VE) named 'ct1'. At the top, there are four columns: a checkbox, the VE name 'ct1', the UUID '0f29802f-6392-4552-b46c-1e80761fca4f', the IP address '172.16.24.225', and the DHCP lease 'dhcp-10-30-17-112.sw.ru'. Below this, there are two buttons: 'Assign' and 'Unassign'. The 'Information' section shows the state as 'running', the type as 'Container', the VE name as 'ct1', the IP address as '172.16.24.225', the image as 'centos-7', and the UUID as '0f29802f-6392-4552-b46c-1e80761fca4f'. The 'Specifications' section shows three progress bars: CPU at 4 cores, Memory at 512 MB, and Storage at 10 GB. At the bottom, there are 'Backups' and 'Log' buttons. A log entry shows 'Mar 2, 2017, 12:34:13 AM' with a size of 256.41 MB.

In the admin mode, the administrator can perform the following tasks:

- Assign VEs to users and unassign VEs from users, see [Managing Virtual Environment Assignments](#) on page 17.
- Impersonate users to perform user-specific VE management tasks, see [Impersonating Users](#) on page 19.

These tasks are described in more detail in the following sections.

4.2 Managing Virtual Environment Assignments

Virtual environments listed in the **Unassigned** group can be assigned to users available to Virtuozone PowerPanel.

Note: Users that have no VEs assigned are not shown in the list on the main screen.

To assign one or more VEs to a user:

1. Check the boxes of the required VEs and click **Assign** above the VE list.

3 VEs selected

Assign **Unassign**

<input type="checkbox"/>	VE Name	UUID
? Unassigned		
<input checked="" type="checkbox"/>	ct1	0f29802f-6392-4552-b46c-1e80761fca4f
<input checked="" type="checkbox"/>	authorit	4fc2d95e-8cd5-44bc-8497-9dd3e0d12396
<input type="checkbox"/>	cl_ac3	8c70b3a2-1a32-4917-91d1-7d8a11a3f7c4
<input checked="" type="checkbox"/>	cl_ac4	15b23b2b-60eb-4f3d-a256-60c14db5e7f5
<input type="checkbox"/>	vm1	112beb4c-9fa1-4e24-8c0f-e78fead5082c

2. Select a user in the opened drop-down list and click **OK**.

Assign 3 instances ✕

Choose user

user1 ✕ ▼

Assign **Cancel**

To assign a single VE to a user, you can also click the VE area to expand it, click **Assign** in the VE area, select a user in the opened drop-down list, and click **OK**.

Unassigning VEs from users is done in a similar way by means of the **Unassign** button.

4.3. Impersonating Users

4.2.1 Assigning Virtual Environments to Users from Command Line

You can also assign virtual environments to users from command line as follows:

```
# vzapi instance update --new-user <username> --new-project <username> <VE_UUID>
```

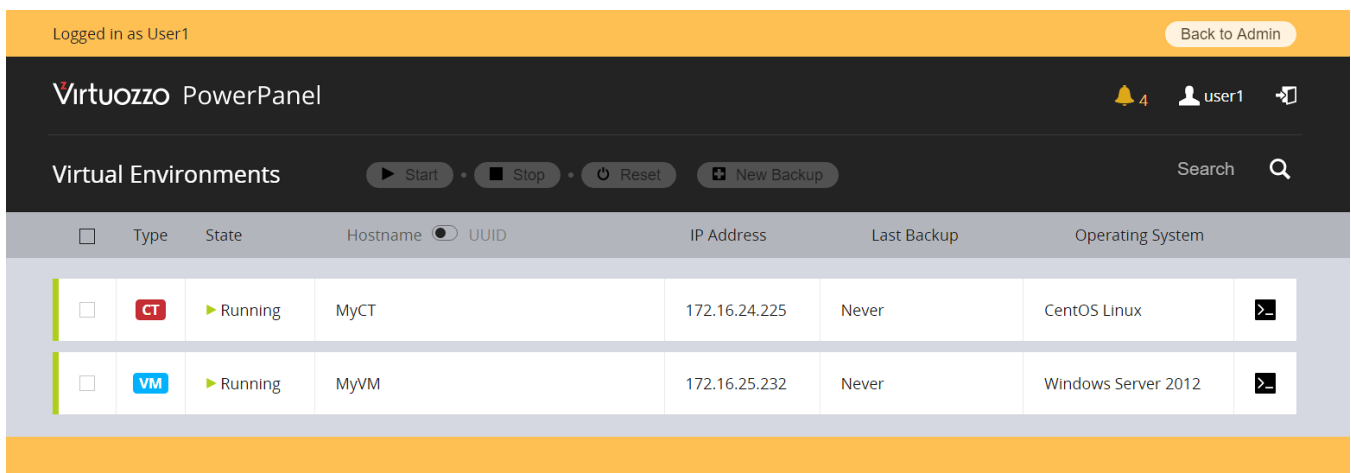
This can be useful if you need to automate the assignment process, for example.

4.3 Impersonating Users

By clicking a user name on the main screen (**Admin** included), the administrator can switch to the user mode, as if logged in to Virtuozzo PowerPanel under that user account, and manage that user's virtual environments.



An example of impersonation is shown below. Click **Back to Admin** in the top right corner to switch to the admin mode.



Impersonating the administrator differs from impersonating regular users, however, as the administrator still sees (and can manage) all VEs, not just those assigned to the user **Admin**.

Note: For details on tasks that can be performed in the user mode, see the [Virtuozzo PowerPanel User's Guide](#).

4.4 Miscellaneous Tasks

4.4.1 Setting Backup Limit for Virtual Environments

By default, each user can create up to 3 backups of each of their virtual environments. To change the default value for both existing and new VEs, do the following:

1. Set the `backup_limit` parameter in the `[DEFAULT]` section of the file `/etc/vzapi/vzapi.conf`. For example:

```
[DEFAULT]
<...>
backup_limit = 5
<...>
```

This will apply the new backup limit to new VEs on compute nodes to be added to the Virtuozzo PowerPanel infrastructure.

2. Restart the `vzapi-compute` service on existing compute nodes. This will apply the new backup limit to new VEs on these nodes.
3. On the controller node, set the same backup limit for existing VEs manually. For example:

```
# mysql vzapi --execute="UPDATE instances SET backup_limit=5;"
```

Note: Backup directory (`/vz/vmprivate/backups` by default) can be changed with the `prlsrvctl set --backup-path <path>` command.

4.4.2 Setting Idle Timeout

By default, users are automatically logged out of Virtuozzo PowerPanel after 24 hours of inactivity. You can change this default value by setting the `expiration` parameter (in seconds) in the `[token]` section in the file `/etc/keystone/keystone.conf`. For example:

4.4. Miscellaneous Tasks

```
[token]
<...>
expiration = 43200
<...>
```

CHAPTER 5

Appendices

5.1 Appendix A: Controller and Compute Ports

This section lists the TCP ports that need to be open for Virtuozzo PowerPanel to operate properly. I in the **Description** column indicates that the port should be open for incoming traffic and O, for outgoing traffic.

5.1.1 Controller Ports

If you have a firewall enabled on the controller, the deploy script will create rules to open these ports automatically.

Port	Description
35357	(IO) Used by the Keystone identity service.
6556, 6557	(IO) Used by the Virtuozzo PowerPanel services <code>vzapi</code> and <code>vnproxy</code> .
5671	(IO) Used by the RabbitMQ message broker to exchange messages between PowerPanel components.
3306	(IO) Used to connect to the internal database.
443	(O) Used to send problem reports to the support team.
80	(IO) Used for HTTP connections, e.g., to download Virtuozzo updates from remote repositories.

5.1. Appendix A: Controller and Compute Ports

5.1.2 Compute Ports

Compute nodes running Virtuozzo do not have the firewall enabled by default. If, however, you have configured and started a firewall manually on a compute node, create rules to open these ports on that compute node. For example, if you use `firewalld`:

```
# firewall-cmd --permanent --zone=public --add-port=35357/tcp --add-port=6556-6557/tcp \  
--add-port=5671/tcp --add-port=3306/tcp
```

Port	Description
35357	(IO) Used by the Keystone identity service.
6556, 6557	(IO) Used by the Virtuozzo PowerPanel services <code>vzapi</code> and <code>vncproxy</code> .
5671	(IO) Used by the RabbitMQ message broker to exchange messages between Virtuozzo PowerPanel components.
3306	(IO) Used to connect to the internal database.