
APACHE
CLOUDSTACK

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- Region, Zons, Pods, Cluster and host setup
- Roles, Accounts, Users, and Domains
- Service Offerings
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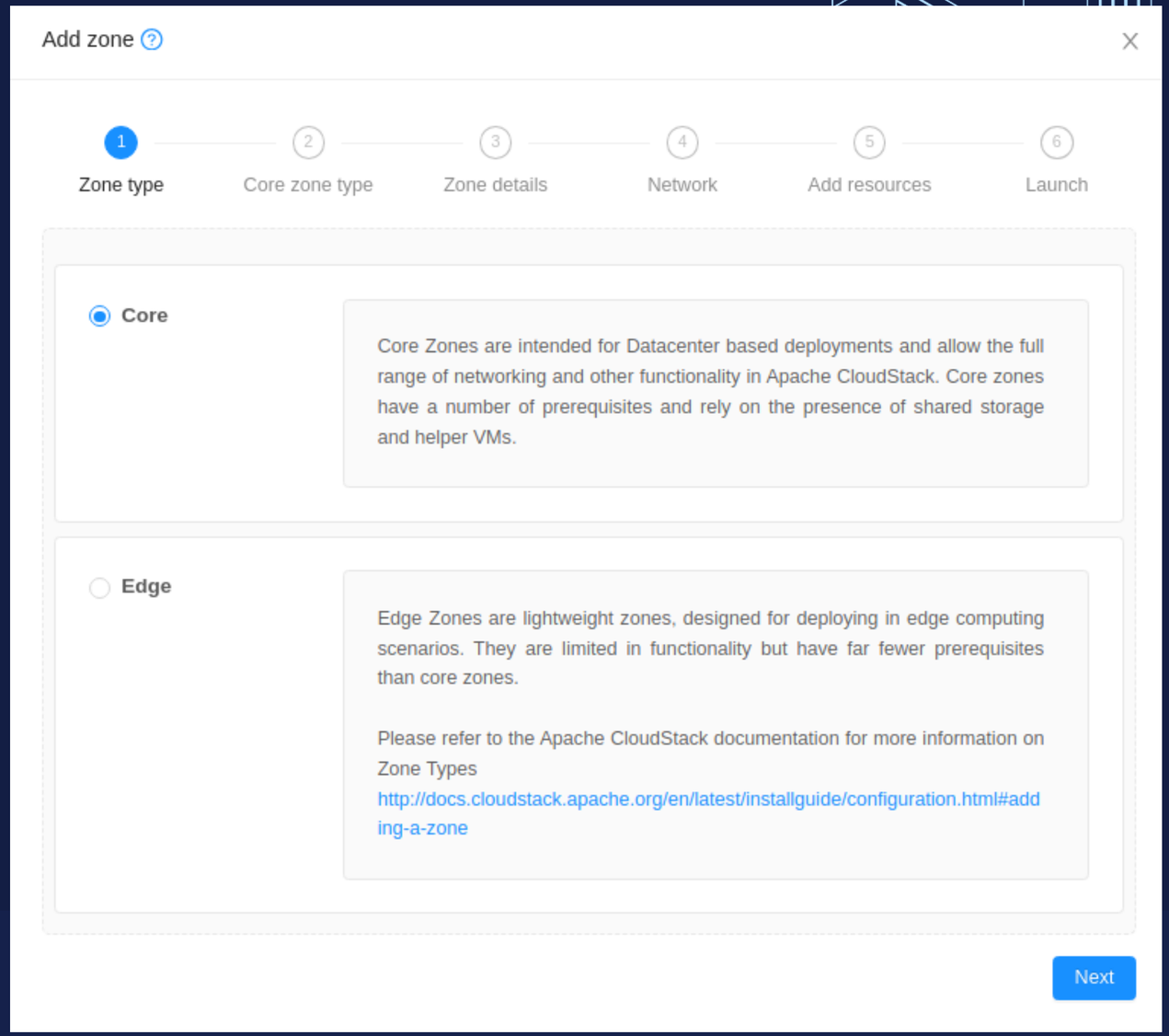
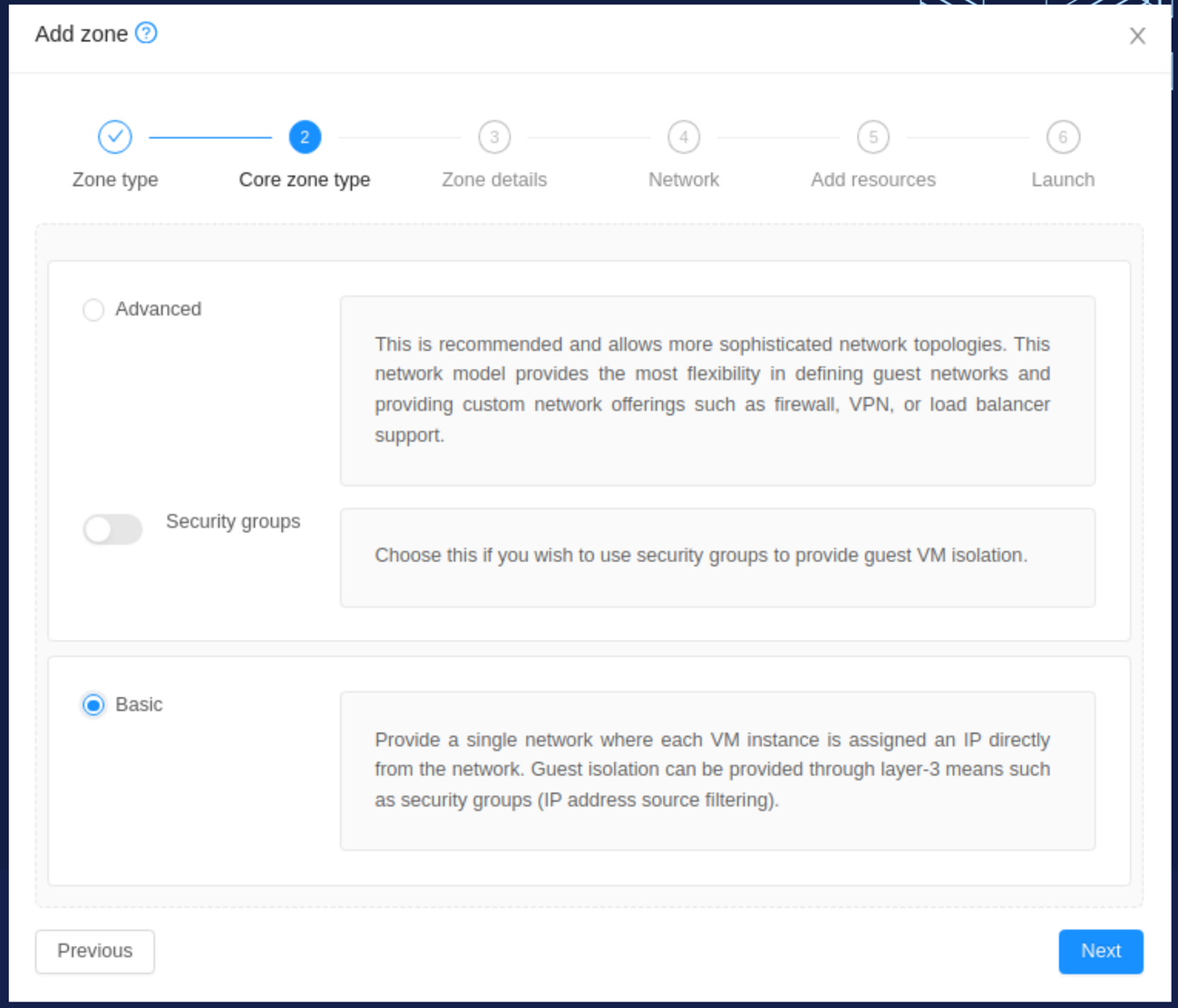
Zone setup

1. In the left navigation, choose Infrastructure.
2. On Zones, click View More.
3. Click Add Zone. The zone creation wizard will appear.
4. Choose one of the following network types:
    - Basic. For AWS-style networking. Provides a single network where each instance is assigned an IP directly from the network. Guest isolation can be provided through layer-3 means such as security groups (IP address source filtering).
    - Advanced. For more sophisticated network topologies. This network model provides the most flexibility in defining guest networks and providing custom network offerings



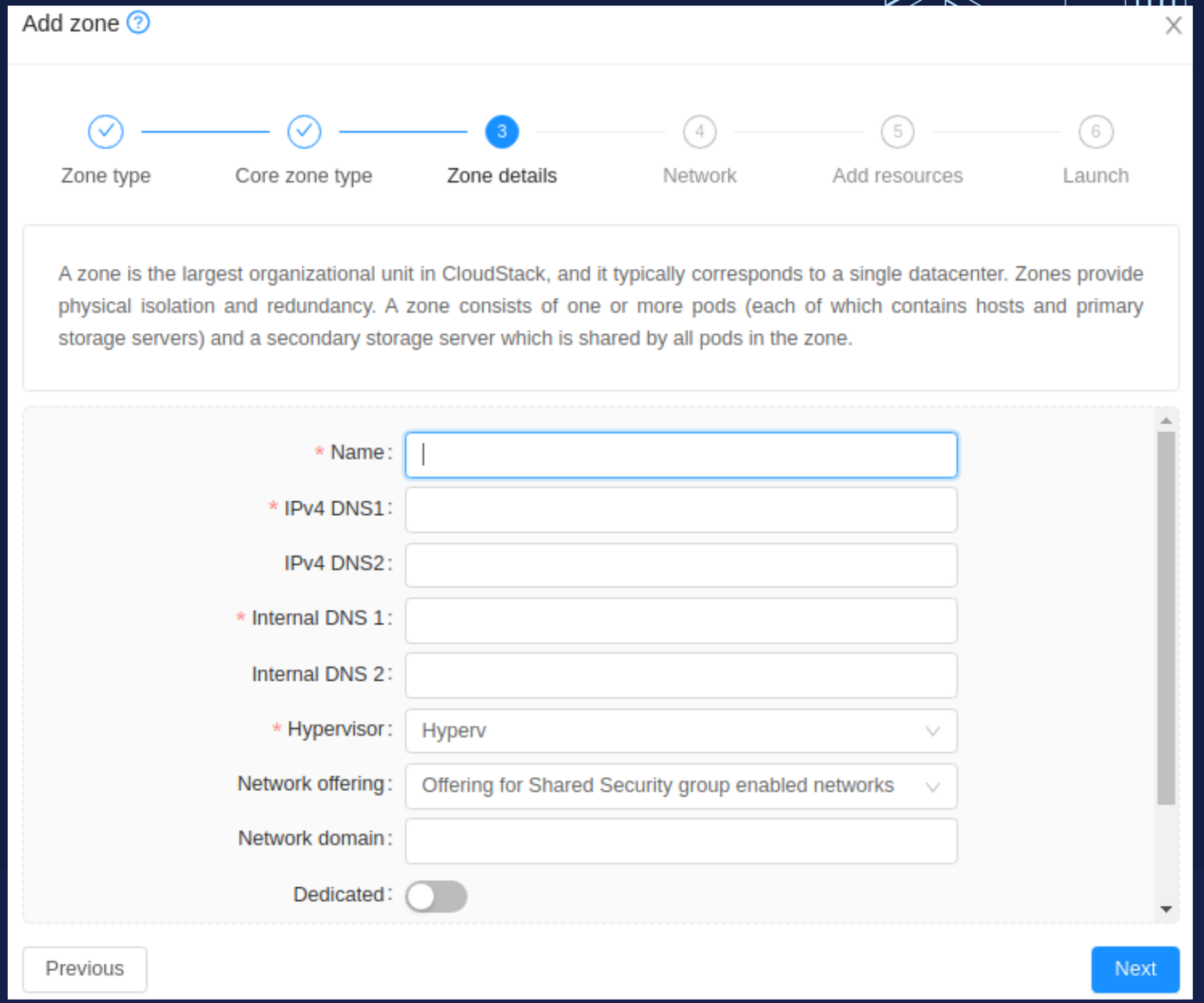
Zone setup

1. DNS 1 and 2. These are DNS servers for use by Guest Instances in the zone. These DNS servers will be accessed via the public network you will add later. The public IP addresses for the zone must have a route to the DNS server named here.
2. Internal DNS 1 and Internal DNS 2. These are DNS servers for use by system VMs in the zone (these are instances used by CloudStack itself, such as virtual routers, console proxies, and Secondary Storage VMs.) These DNS servers will be accessed via the management traffic network interface of the System VMs. The private IP address you provide for the pods must have a route to the internal DNS server named here.



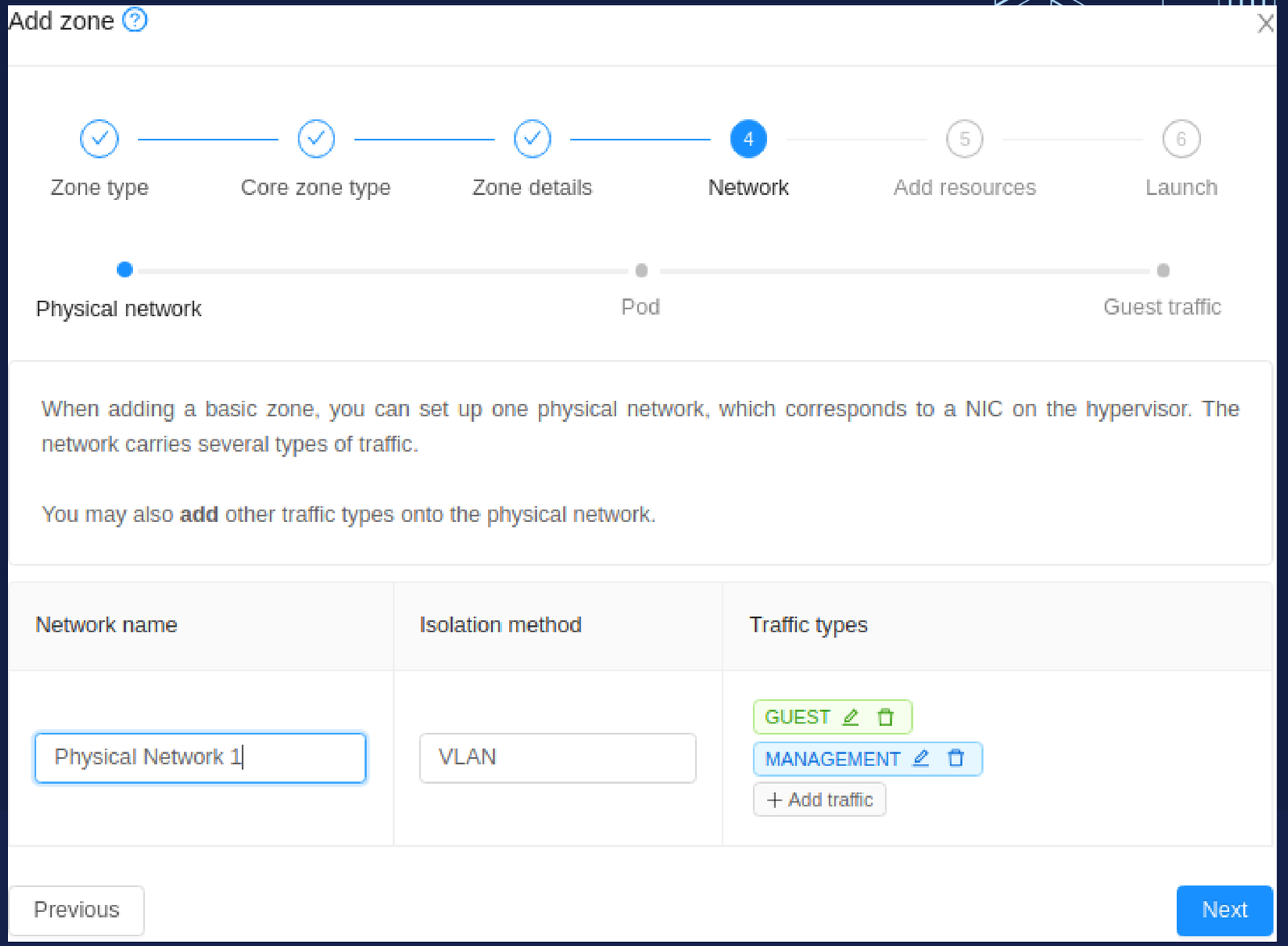
Zone setup

- Hypervisor. (Introduced in version 3.0.1) Choose the hypervisor for the first cluster in the zone. You can add clusters with different hypervisors later, after you finish adding the zone.
- Network Offering. Your choice here determines what network services will be available on the network for Guest Instances.



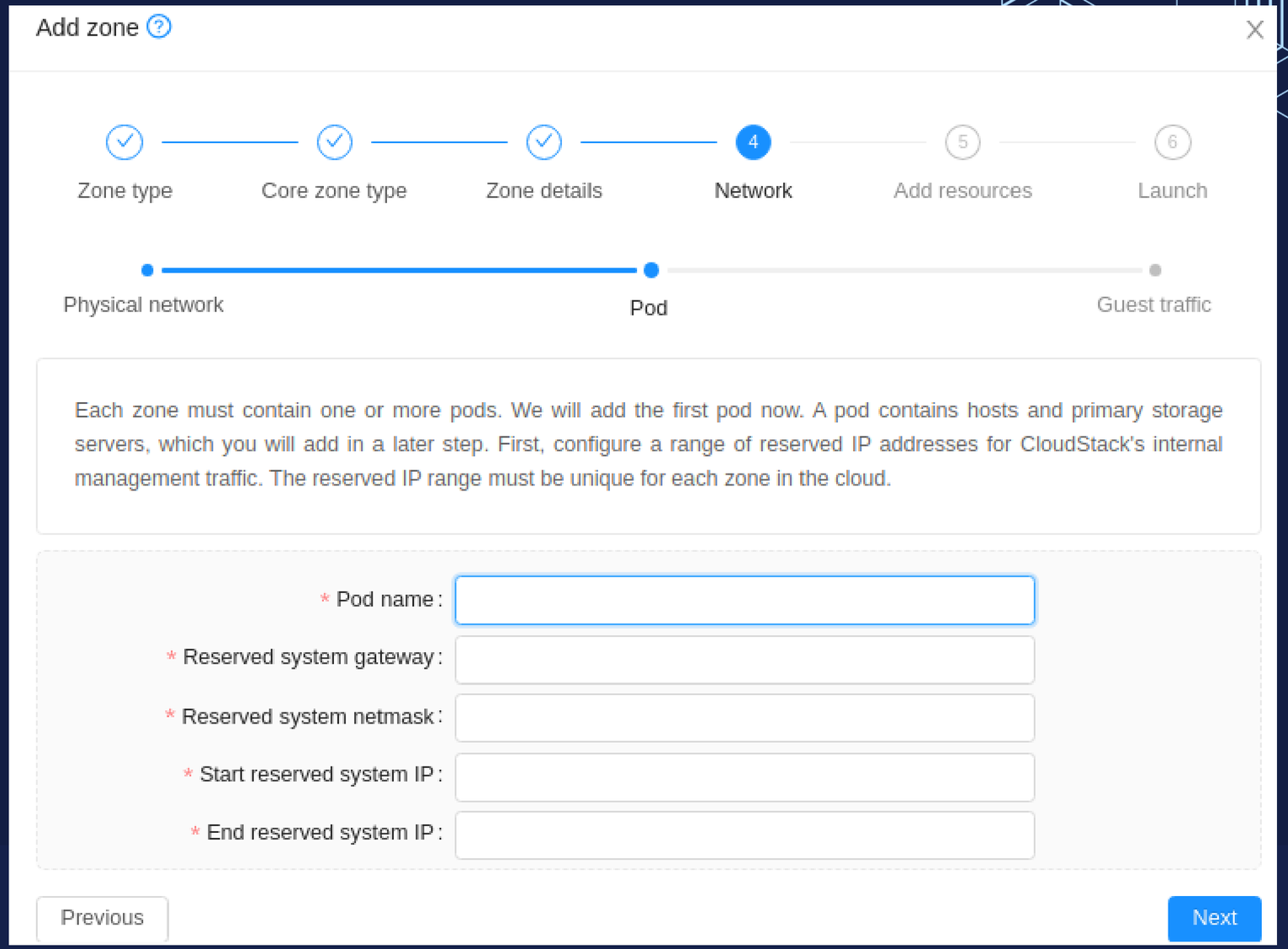
Zone setup

- Network Domain. (Optional) If you want to assign a special domain name to the Guest Instance network, specify the DNS suffix.
- Public. A public zone is available to all users. A zone that is not public will be assigned to a particular domain. Only users in that domain will be allowed to create Guest Instances in this zone.



Zone setup

- To configure the first pod, enter the following, then click Next:
- Pod Name. A name for the pod.
- Reserved system gateway. The gateway for the hosts in that pod.
- Reserved system netmask. The network prefix that defines the pod's subnet. Use CIDR notation.
- Start/End Reserved System IP. The IP range in the management network that CloudStack uses to manage various system VMs, such as Secondary Storage VMs, Console Proxy VMs, and DHCP. For more information, see System Reserved



Zone setup

- Configure the network for guest traffic. Provide the following, then click Next:
  - Guest gateway. The gateway that the guests should use.
  - Guest netmask. The netmask in use on the subnet the guests will use.
  - Guest start IP/End IP. Enter the first and last IP addresses that define a range that CloudStack can assign to guests.
- In a new pod, CloudStack adds the first cluster for you. You can always add more clusters later. For an overview of what a cluster is, see About Clusters.
- To configure the first cluster, enter the following, then click Next:
- Hypervisor. (Version 3.0.0 only; in 3.0.1, this field is read only) Choose the type of hypervisor software that all hosts in this cluster will run. If you choose VMware, additional fields appear so you can give information about a vSphere cluster. For vSphere servers, we recommend creating the cluster of hosts in vCenter and then adding the entire cluster to CloudStack. See Add Cluster: vSphere.
- Cluster name. Enter a name for the cluster. This can be text of your choosing and is not used by

Zone setup

- To configure the first host, enter the following, then click Next:
  - Host Name. The DNS name or IP address of the host.
  - Username. The username is root.
  - Password. This is the password for the user named above (from your XenServer or KVM install).
  - One additional facility that is available in case of KVM is, host can also be added using CloudStack’s SSH key without having to provide host password.
  - Before adding the host in CloudStack do the following,
  - Copy the SSH public key from /var/cloudstack/management/.ssh/id_rsa.pub on the management server
  - Add the copied key to /root/.ssh/authorized_keys file on the host
  - Select “System SSH Key” and proceed with next steps.

Roles

A role represents a set of allowed functions. All CloudStack Accounts have a role attached to them that enforce access rules on them to be allowed or disallowed to make an API request. Typically there are four default roles: root admin, resource admin, domain admin and User. Newer roles have been added which include Read-Only Admin, Read-Only User, Support Admin and Support User which are in turn based on the aforementioned roles.

Accounts

An Account typically represents a customer of the service provider or a department in a large organization. Multiple Users can exist in an Account.

Domains

Accounts are grouped by domains. Domains usually contain multiple Accounts that have some logical relationship to each other and a set of delegated administrators with some authority over the domain and its subdomains. For example, a service provider with several resellers could create a domain for each reseller.

Users

Users are like aliases in the Account. Users in the same Account are not isolated from each other, but they are isolated from Users in other Accounts. Most installations need not surface the notion of Users; they just have one User per Account. The same User cannot belong to multiple Accounts.

Username is unique in a domain across Accounts in that domain. The same username can exist in other domains, including sub-domains. Domain name can repeat only if the full pathname from root is unique. For example, you can create root/d1, as well as root/foo/d1, and root/

Others

- Domain Administrators

Domain administrators can perform administrative operations for Users who belong to that domain. Domain administrators do not have visibility into physical servers or other domains.

- Root Administrator

Root administrators have complete access to the system, including managing Templates, service offerings, customer care administrators, and domains

- Read Only Administrator

A restricted admin role in which an Account is only allowed to perform any list, get or find operations but not perform any other operation which can change the infrastructure, configuration or User resources.

- Read Only User

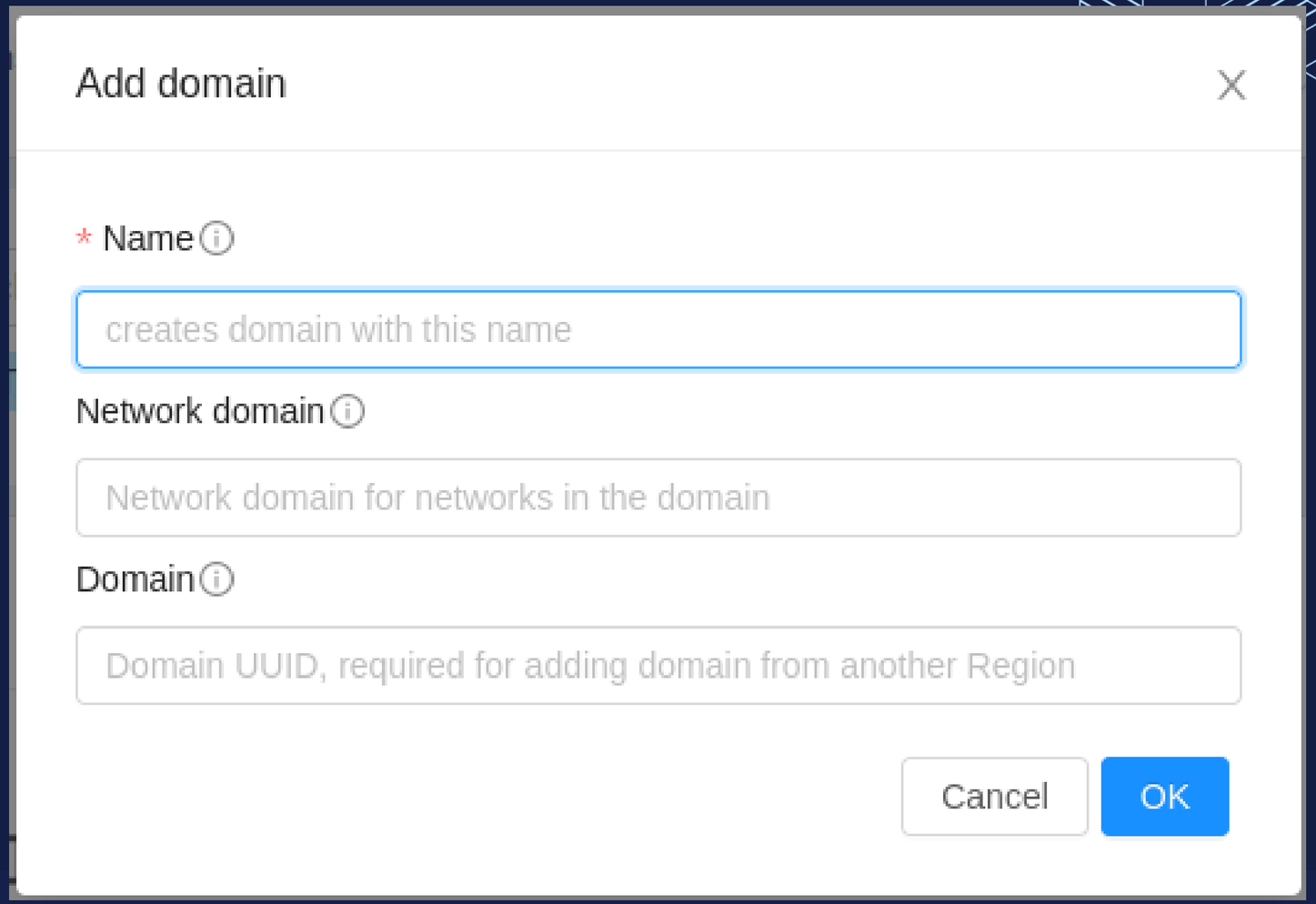
A restricted User role in which an Account is only allowed to perform list, get or find operations. It can be used by Users who may only be interested in monitoring and usage of resources.

Create a new domain

You will have to enter the details of the domain that you are creating now:

• Name: This is the name of the new domain that you are creating.

• Network Domain (Optional): This is the custom DNS suffix that you may want to assign to the network in this domain.



Create a new account

You will have to enter the details of the domain that you are creating now:

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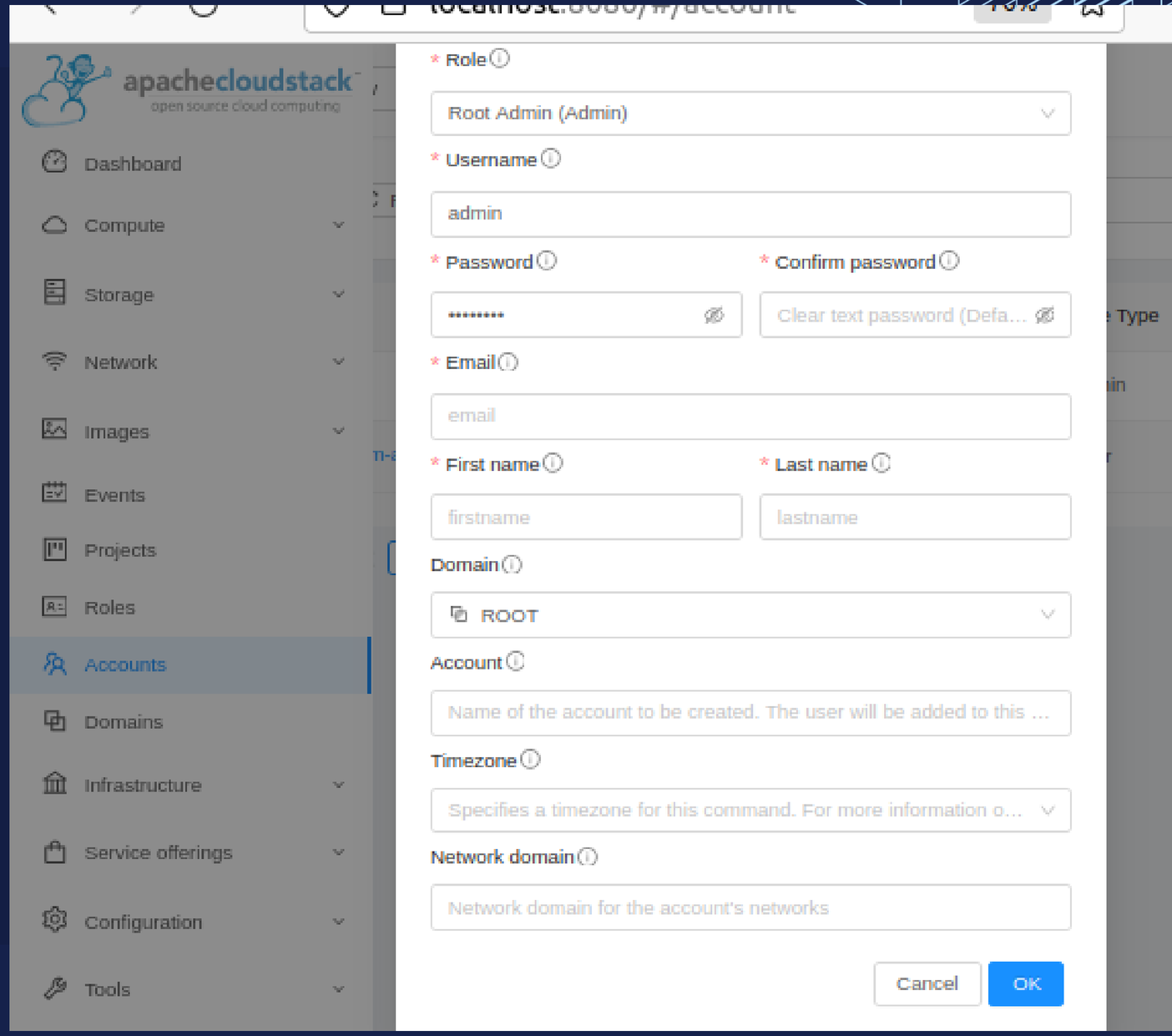
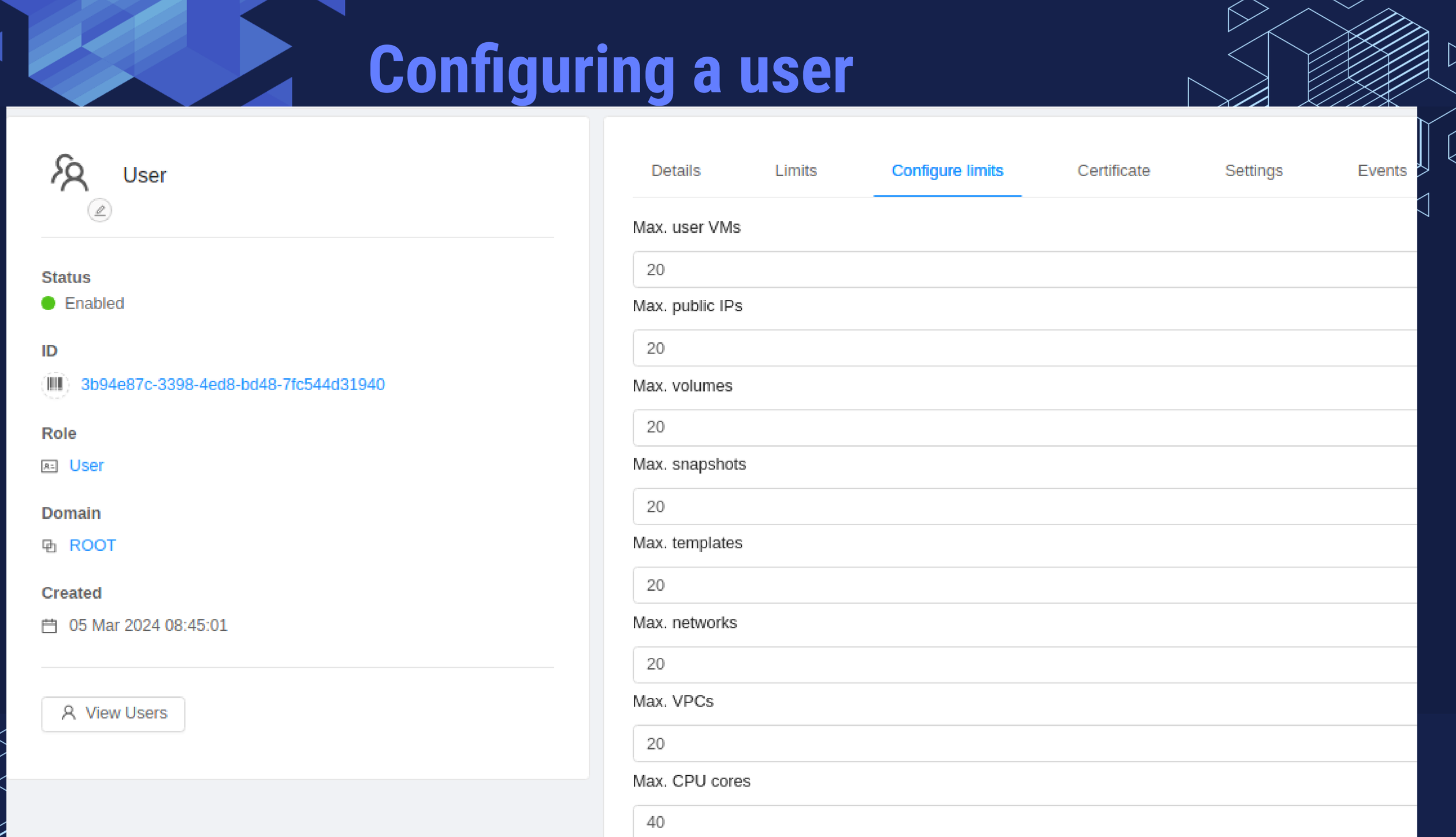
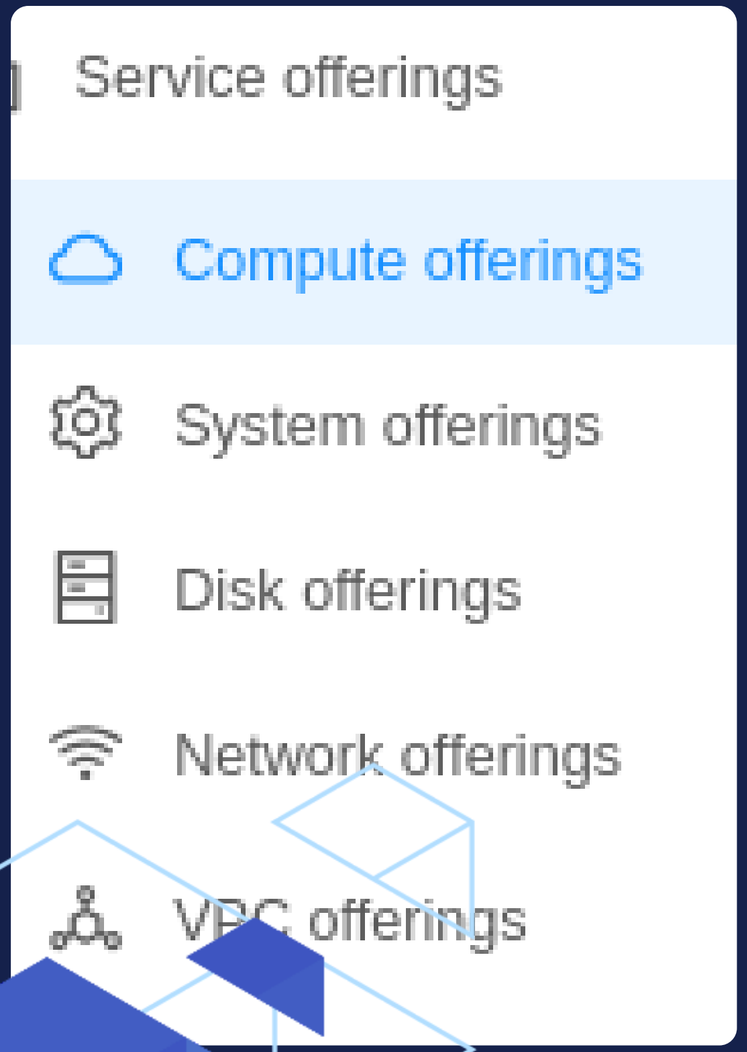


Configuring a user





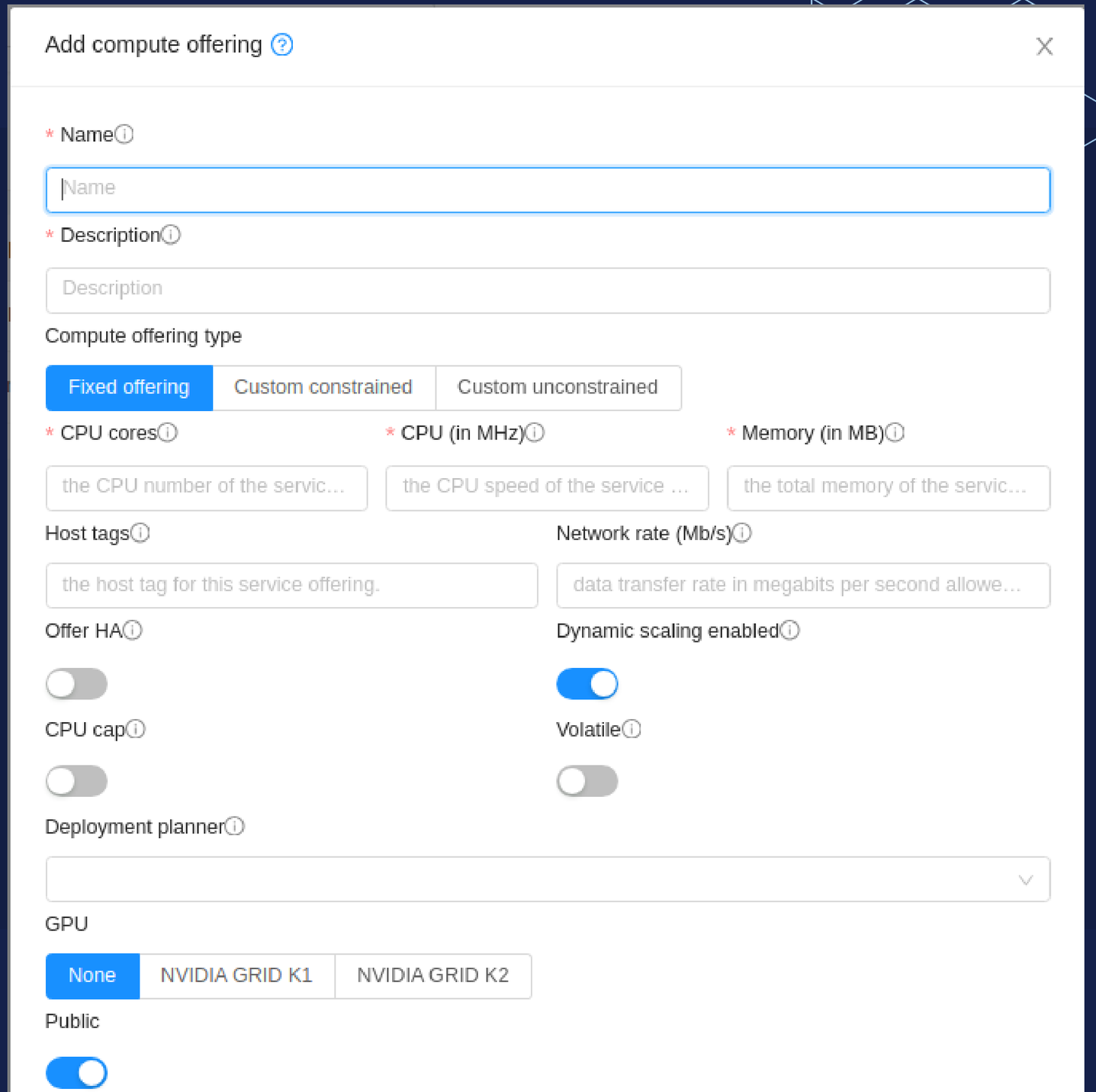
Service offerings

Disk Offerings, Network Offerings, and Templates

In addition to the physical and logical infrastructure of your cloud and the CloudStack software and servers, you also need a layer of user services so that people can actually make use of the cloud. This means not just a user UI, but a set of options and resources that users can choose from, such as Templates for creating Instances, disk storage, and more.

Compute offerings

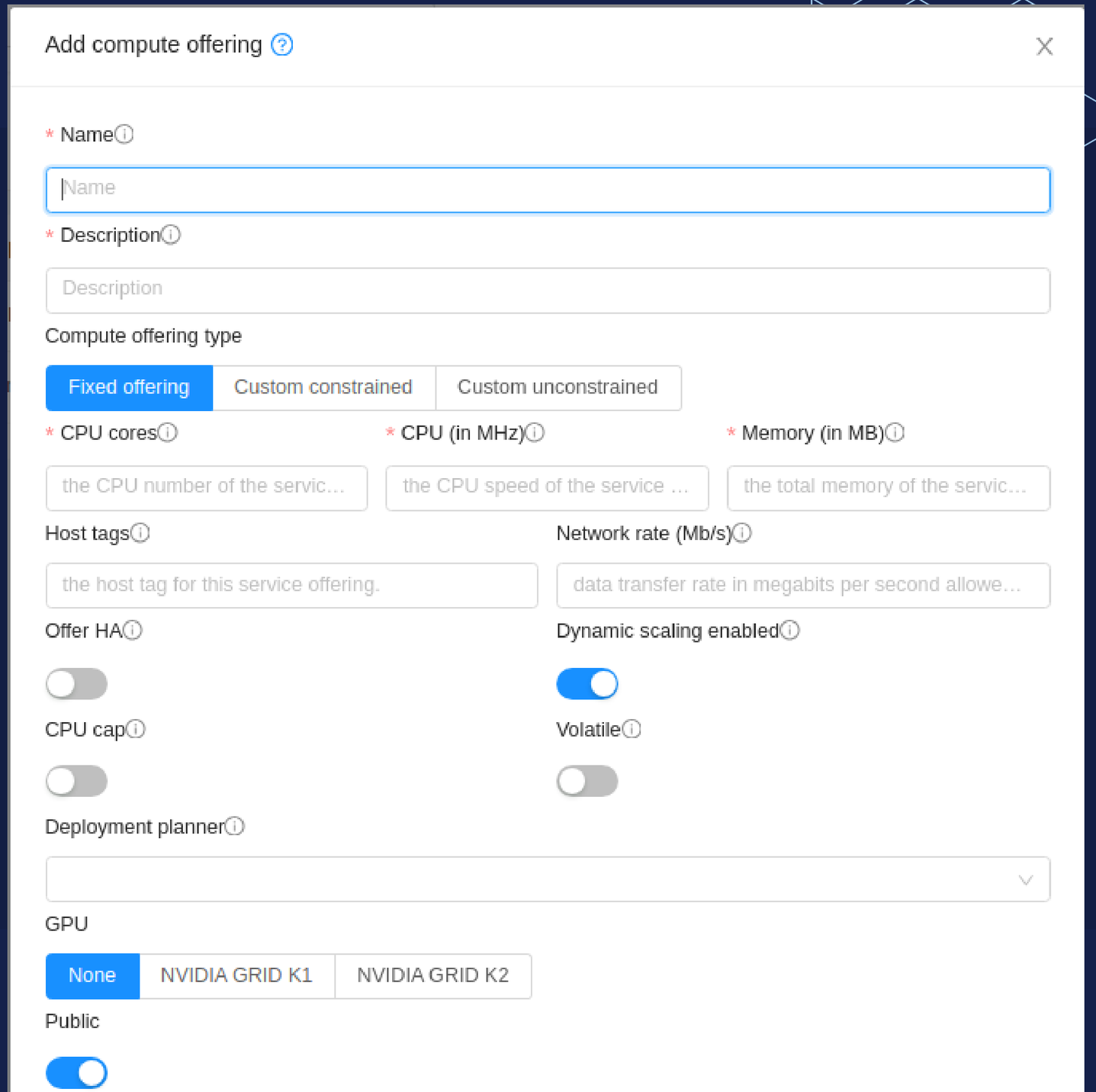
Compute offerings These offerings are basically details about the compute offerings such as the choice of CPU speed, number of vCPUs, RAM size, root device tags, storage type and storage tags, network rate, and other compute choices. To add a new compute offering, we need to move to the Service offerings tab and select compute offering from the drop-down menu at the top



Compute offerings

A service offering is a set of virtual hardware features such as CPU core count and speed, memory, and disk size. The CloudStack administrator can set up various offerings, and then end users choose from the available offerings when they create a new Instance. Based on the user's selected offering, CloudStack emits usage records that can be integrated with billing systems.

Compute offerings may be "fixed"



Compute Offerings

- In fixed offering the Number of CPUs, Memory and CPU frequency in each service offerings are predefined by the CloudStack administrator
- In custom unconstrained offerings they are left undefined so that the end-user can enter their own desired values when creating a Guest Instance.
- Instead of defining a compute offering for every imaginable combination of values that a user might want, the administrator can define offerings that provide some flexibility to the users and can serve as the basis for several different Instance configurations.

Compute Offerings

A service offering includes the following elements:

- CPU, memory, and network resource guarantees
- How resources are metered
- How the resource usage is charged
- How often the charges are generated

Compute Offerings

- Network Rate: Allowed data transfer rate in MB per second.
- Offer HA: If yes, the administrator can choose to have the system VM be monitored and as highly available as possible.
- Dynamic Scaling Enabled: If yes, Instance can be dynamically scalable of cpu or memory
- CPU cap: Whether to limit the level of CPU usage even if spare capacity is available.
- Volatile: If checked, Instances created from this service offering will have their root disks reset upon reboot. This is useful for secure environments that need a fresh start on every boot and for desktops

Compute Offerings

Deployment Planner: Choose the technique that you would like CloudStack to use when deploying Instances based on this service offering.

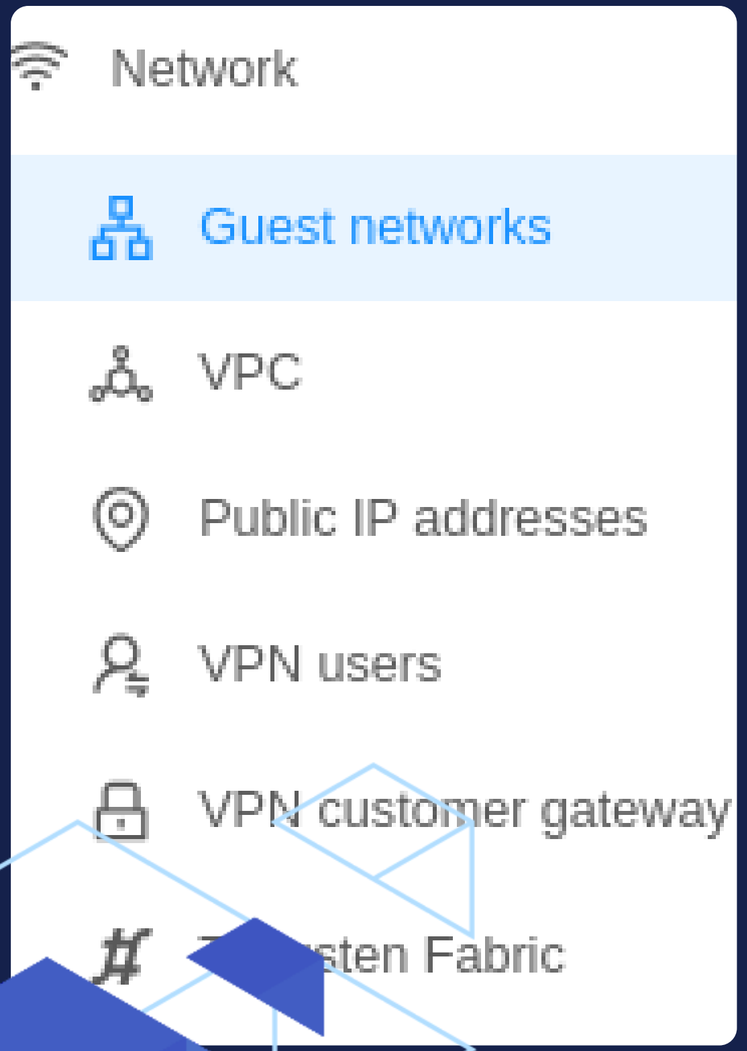
- First Fit: places new Instances on the first host that is found having sufficient capacity to support the Instance’s requirements.
- User Dispersing: makes the best effort to evenly distribute Instances belonging to the same account on different clusters or pods.
- User Concentrated: prefers to deploy Instances belonging to the same account within a single pod.
- Implicit Dedication: will deploy instances on private infrastructure that is dedicated to a specific domain or account.
- Bare Metal: is used with bare metal hosts. See Bare Metal Installation in the Installation

Compute Offerings

- Planner Mode: Used when ImplicitDedicationPlanner is selected in the previous field. The planner mode determines how instances will be deployed on private infrastructure that is dedicated to a single domain or account.
  - Strict: A host will not be shared across multiple accounts. For example, strict implicit dedication is useful for deployment of certain types of applications, such as desktops, where no host can be shared between different accounts without violating the desktop software's terms of license.
  - Preferred: The instance will be deployed in dedicated infrastructure if possible. Otherwise, the instance can be deployed in shared infrastructure.

Compute Offerings

- Storage type: The type of disk that should be allocated. Local allocates from storage attached directly to the host where the system VM is running. Shared allocates from storage accessible via NFS.
- Provisioning type: The type of disk that should be allocated. Valid values are thin, sparse, fat. When using the VMWare hypervisor, these values are mapped to the following vSphere disk provisioning types:
  - thin: Thin Provision
  - sparse: Thick Provision Lazy Zeroed
  - fat: Thick Provision Eager Zeroed



Network Setup

Overview of Setting Up Networking for Users

Networking is one of the most important aspects in the deployment of a cloud solution. Maintaining the privacy and isolation of the users' data in a multitenant environment is of prime importance. CloudStack allows administrators to define network topologies at various levels, which enables users to build complex application environments on the cloud.

Virtual Networks

A virtual network is a logical construct that enables multi-tenancy on a single physical network. In CloudStack a virtual network can be shared or isolated.

Isolated Networks

- An isolated network can be accessed only by Instances of a single account. Isolated networks have the following properties.
- Resources such as VLAN are allocated and garbage collected dynamically
- There is one network offering for the entire network
- The network offering can be upgraded or downgraded but it is for the

Shared Networks

A shared network can be accessed by Instances that belong to many different accounts. Network Isolation on shared networks is accomplished by using techniques such as security groups, which is supported only in Basic zones or Advanced Zones with Security Groups.

- Shared Networks are created by the end users or the administrator. Network offerings which allow the network creator to specify a VLAN can only be created by the root admins.
- Shared Networks can be designated to a certain domain
- Shared Network resources such as VLAN and physical network that it maps to are designated by the administrator

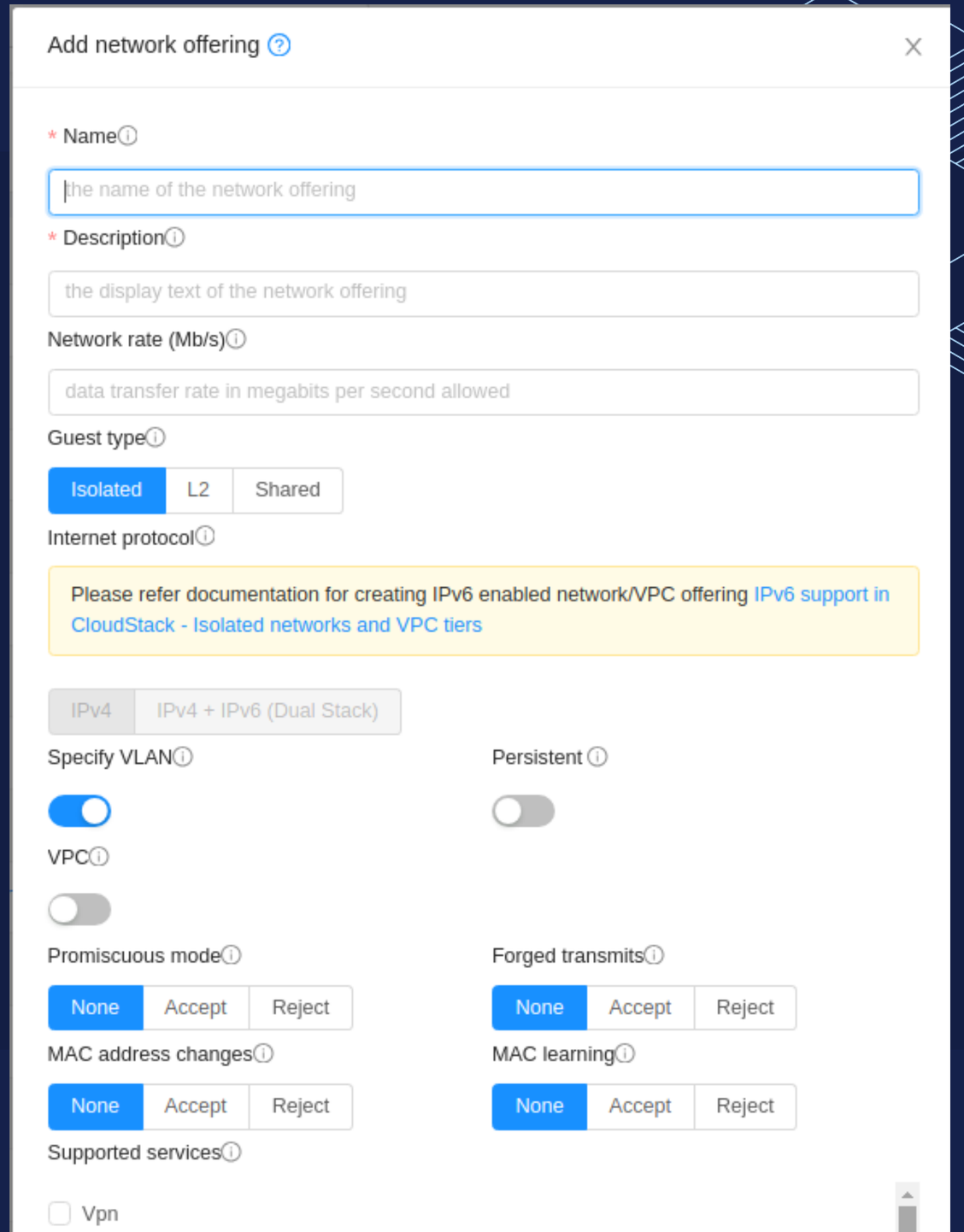
L2 Networks

L2 networks provide network isolation without any other services. This means that there will be no virtual router. It is assumed that the end user will have their own IPAM in place, or that they will statically assign IP addresses.

- L2 networks can be created by the end users, however network offerings which allow the network creator to specify a VLAN can only be created by the root admins.
- CloudStack does not assign IP addresses to instances.
- Userdata and metadata can be passed to the instance using a config drive (which must be enabled in the network service offering)

Network Offerings

The CloudStack administrator can create any number of custom network offerings, in addition to the default network offerings provided by CloudStack. By creating multiple custom network offerings, you can set up your cloud to offer different classes of service on a single multi-tenant physical network.



Network Offerings

- Network Rate. Allowed data transfer rate in MB per second.
- Guest Type. Choose whether the guest network is isolated or shared.
- Persistent. Indicate whether the guest network is persistent or not. The network that you can provision without having to deploy an instance on it is termed persistent network.
- Specify VLAN. Indicate whether a VLAN could be specified when this offering is used. If you select this option and later use this network offering while creating a VPC Network Tier or an isolated network, you will be able to specify a VLAN ID for the network you create.
- VPC. This option indicate whether the guest network is Virtual Private Cloud-enabled. A Virtual Private Cloud (VPC) is a private, isolated part of CloudStack. A VPC can

Network Offerings

- Promiscuous Mode. Applicable for guest networks on VMware hypervisor only. It accepts the following values for desired behaviour of the network elements:
  - Reject - The switch drops any outbound frame from an Instance adapter with a source MAC address that is different from the one in the .vmx configuration file.
  - Accept - The switch does not perform filtering, and permits all outbound frames.
- Forged Transmits. Applicable for guest networks on VMware hypervisor only. It accepts the following values for desired behaviour of the network elements:
  - Reject - The switch drops any outbound frame from an Instance adapter with a source MAC address that is different from the one in the .vmx configuration file.
  - Accept - The switch does not perform filtering, and permits all outbound frames.

Network Offerings

- **MAC Address Changes.** Applicable for guest networks on VMware hypervisor only. It accepts the following values for desired behaviour of the network elements:
  - Reject - If the guest OS changes the effective MAC address of the Instance to a value that is different from the MAC address of the instance network adapter.
  - Accept - If the guest OS changes the effective MAC address of the Instance to a value that is different from the MAC address of the instance network adapter, the switch allows frames to the new address to pass.
- **MAC Learning**. Applicable for guest networks on VMware hypervisor only with VMware Distributed Virtual Switches version 6.6.0 & above and vSphere version 6.7 & above. It accepts the following values for desired behaviour of the network elements:
  - Reject - Network connectivity for multiple MAC address behind a single vNIC will not work.

Network Offerings

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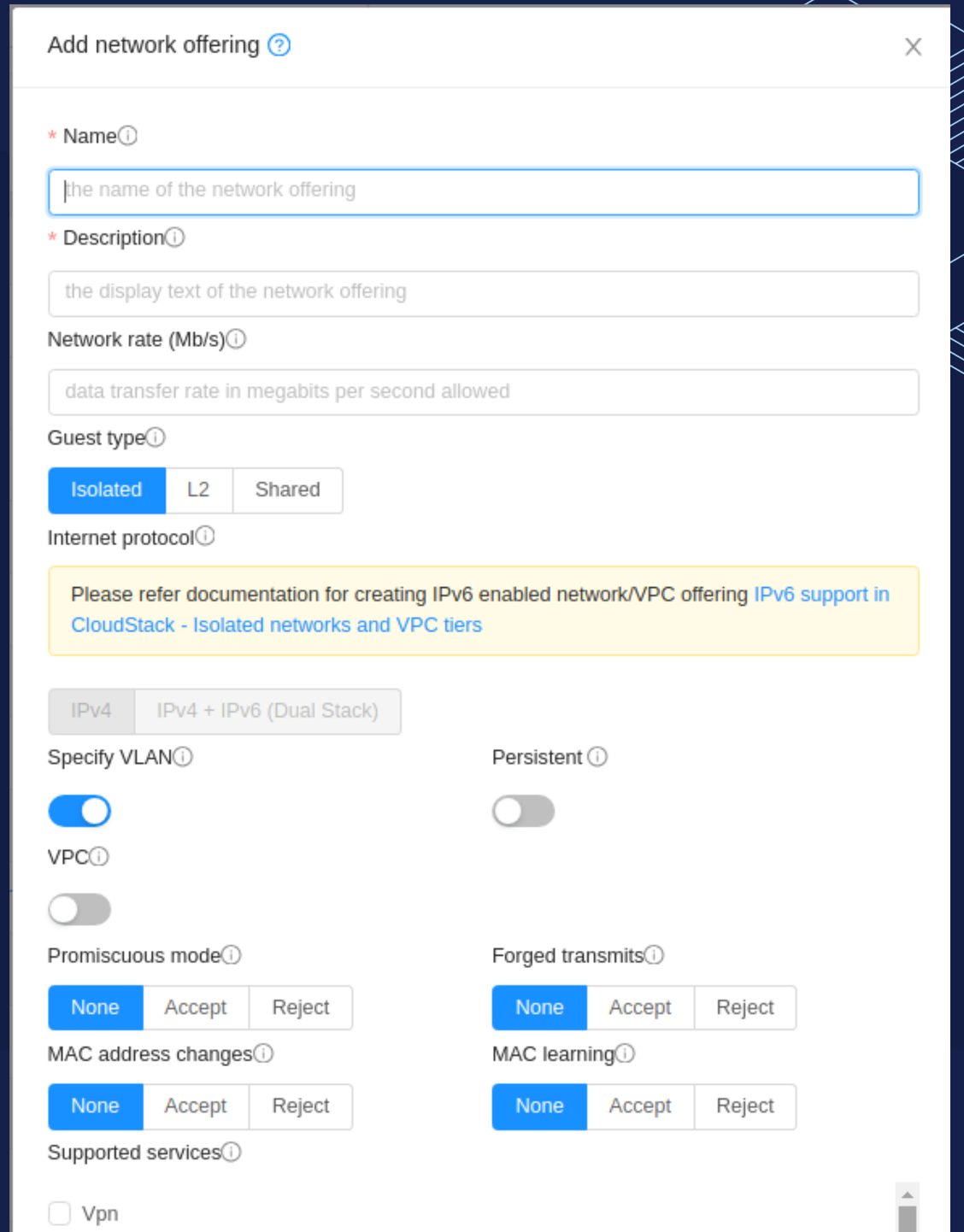
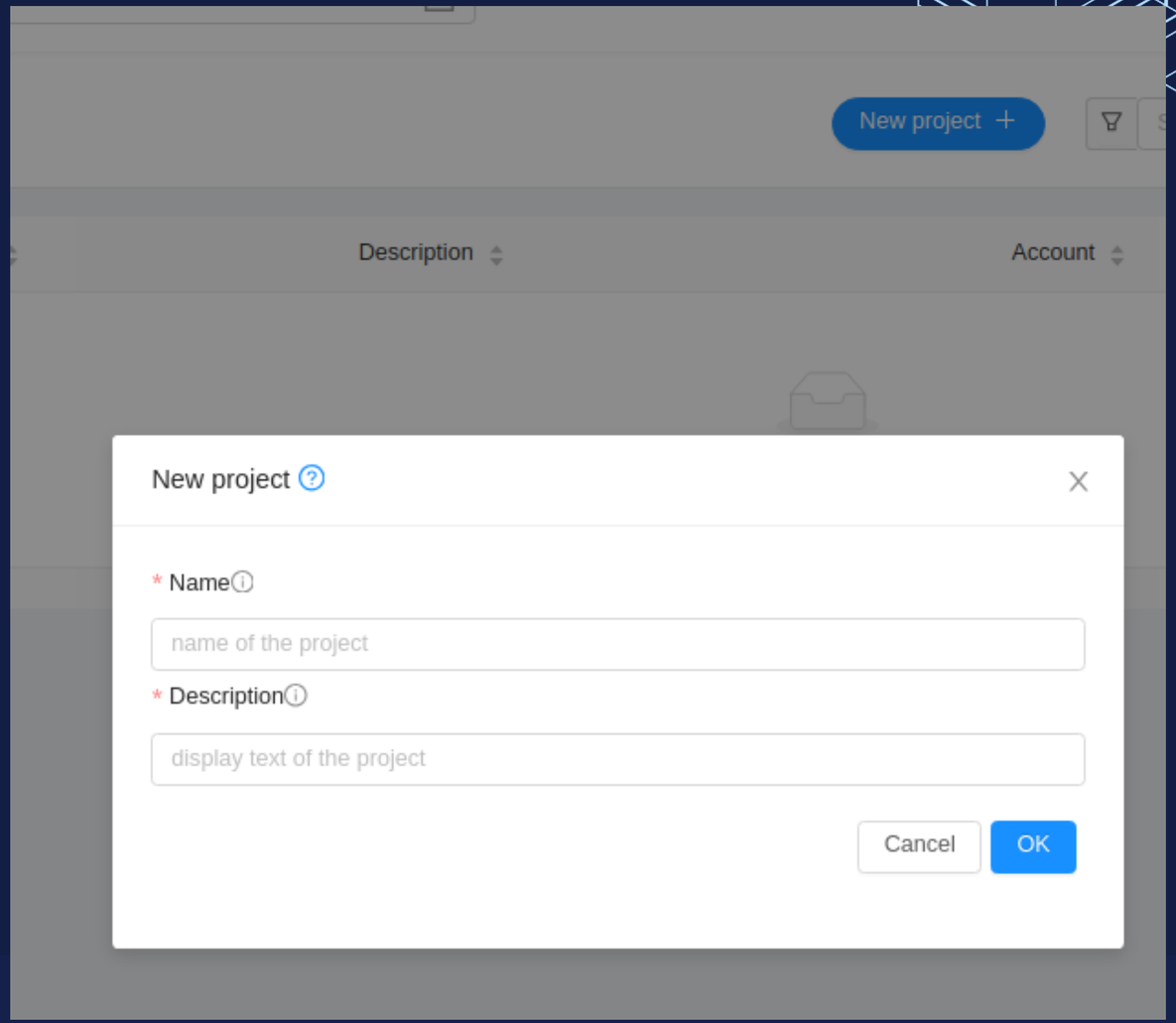


Create a Project

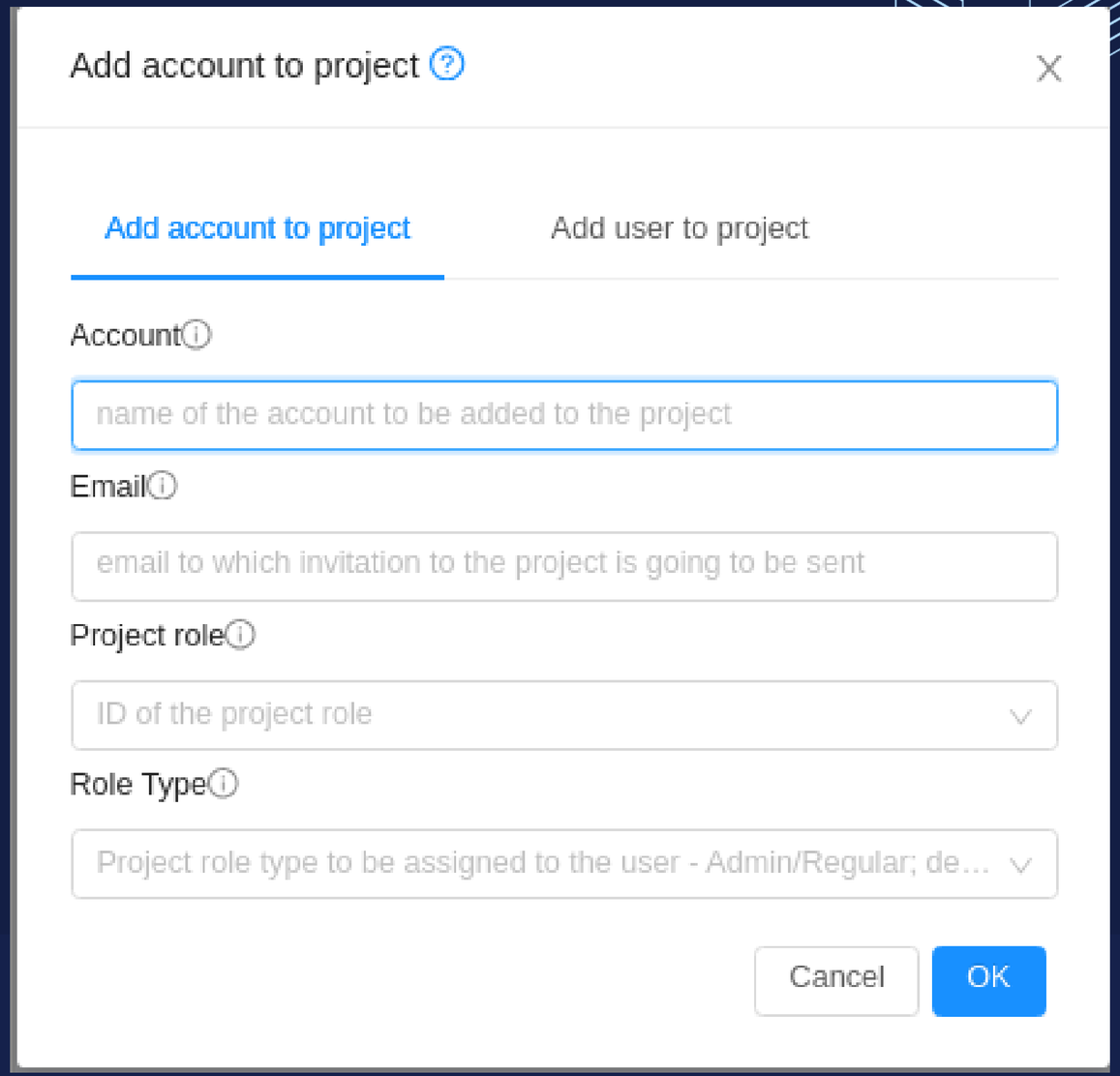
Projects are used to organize people and resources. CloudStack Users within a single domain can group themselves into project teams so they can collaborate and share virtual resources such as Instances, Snapshots, Templates, data disks, and IP addresses. CloudStack tracks resource usage per project as well as per User, so the usage can be billed to either a User Account or a project. For example, a private cloud within a software company might have all members of the QA department assigned to one project, so the company can track the resources used in testing while the project members can more



Add users to a Project

Add users and accounts to project to associate with a single associations

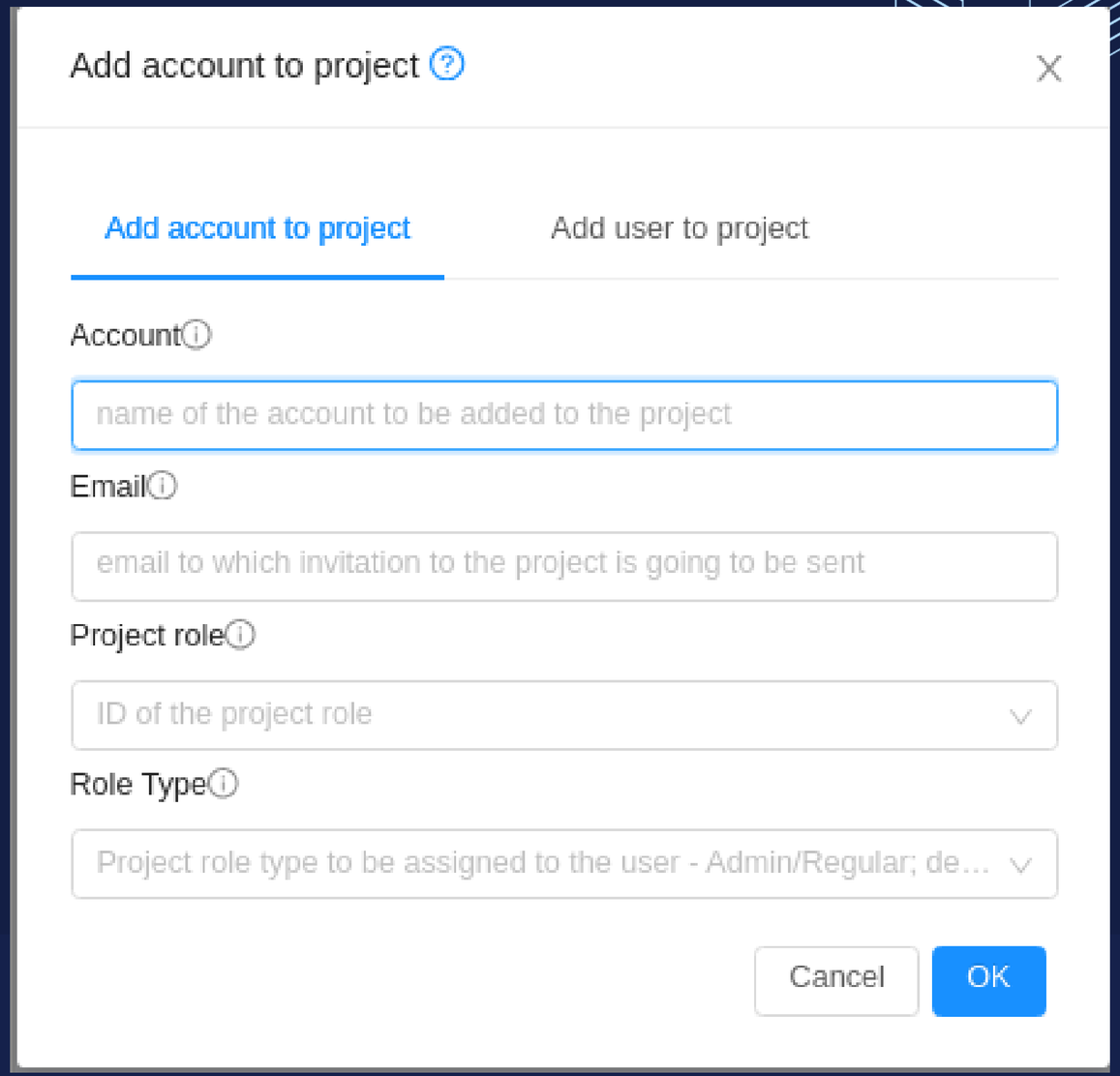
1. Click the name of the project you want to work with.
2. Click on the Add Account to Project button. This will have 2 tabs, one to add Account to the project and the other to add a User to the project. Here, we can specify the:
    - Account or User and/or email id of the User to be invited
3. You can invite only people who have an Account in this cloud within the same domain as the project. However, you can send the invitation to any email address.



Accepting a Membership Invitation

If you have received an invitation to join a CloudStack project, and you want to accept the invitation, follow these steps:

1. Log in to the CloudStack's UI.
2. In the left navigation, click Projects.
3. Click on the Project Invitations button
4. If you see the invitation listed onscreen, click the Accept button.

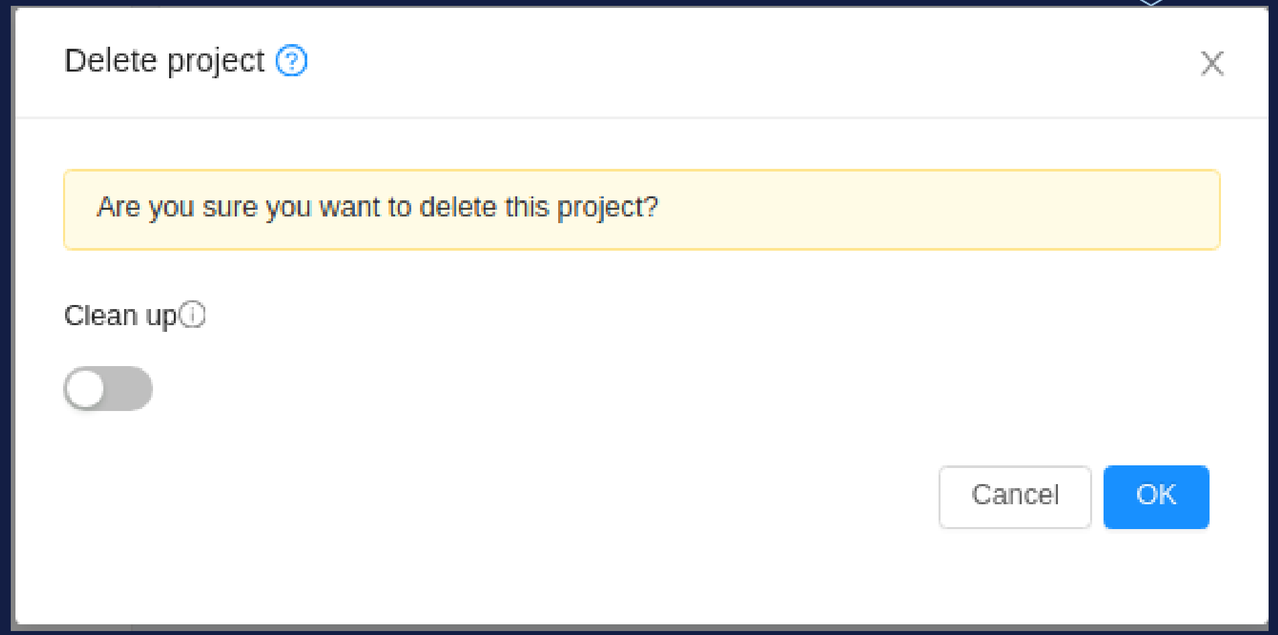


Deleting a project

When a project is suspended, it retains the resources it owns, but they can no longer be used. No new resources or members can be added to a suspended project.

When a project is deleted, its resources are destroyed, and member Accounts are removed from the project. The project's status is shown as Disabled pending final deletion.

A project can be suspended or deleted by the project administrator, the domain administrator of the domain the project belongs to or of its parent domain, or the CloudStack root administrator.



1. Log in to the CloudStack UI.
2. In the left navigation, click Projects.
3. Click the name of the project.

THANK YOU