



The Linux & Open Source Company

Foreman

Resource Quota

Config Management Camp 2024

Outline

01. Who am I?

02. What are Resource Quotas?

03. Resource Quotas in Foreman

04. Design Considerations

05. Demonstration

06. Outlook

Bastian Schmidt

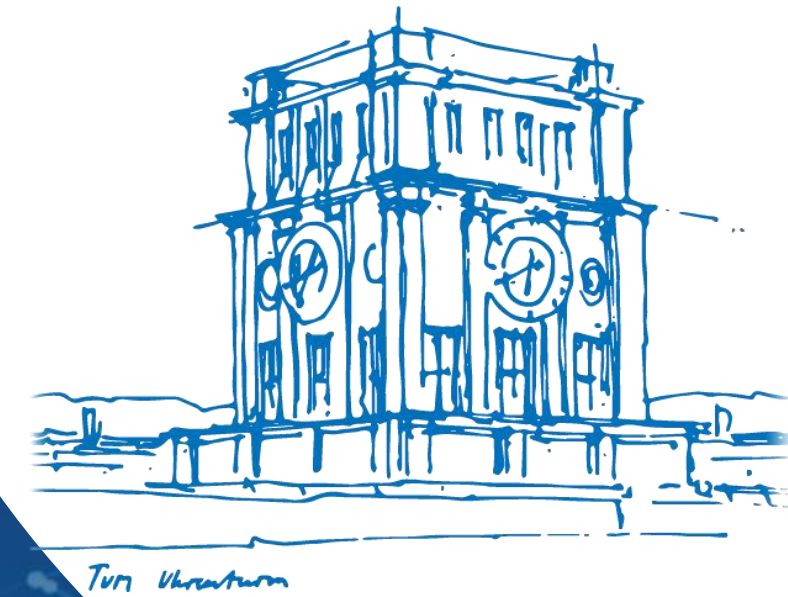
 [Bastian Schmidt](#)

 [bastian-src](#)

 schmidt@atix.de

Bastian Schmidt

- Master student at TU Munich



 [Bastian Schmidt](#)

 [bastian-src](#)

 schmidt@atix.de

Bastian Schmidt

- Master student at TU Munich
- Working student at ATIX since 2020

 [Bastian Schmidt](#)

 [bastian-src](#)

 schmidt@atix.de



Bastian Schmidt

- Master student at TU Munich
- Working student at ATIX since 2020
- Most of the time working on Foreman Salt and Ubuntu provisioning - nowadays *Resource Quota*

 [Bastian Schmidt](#)

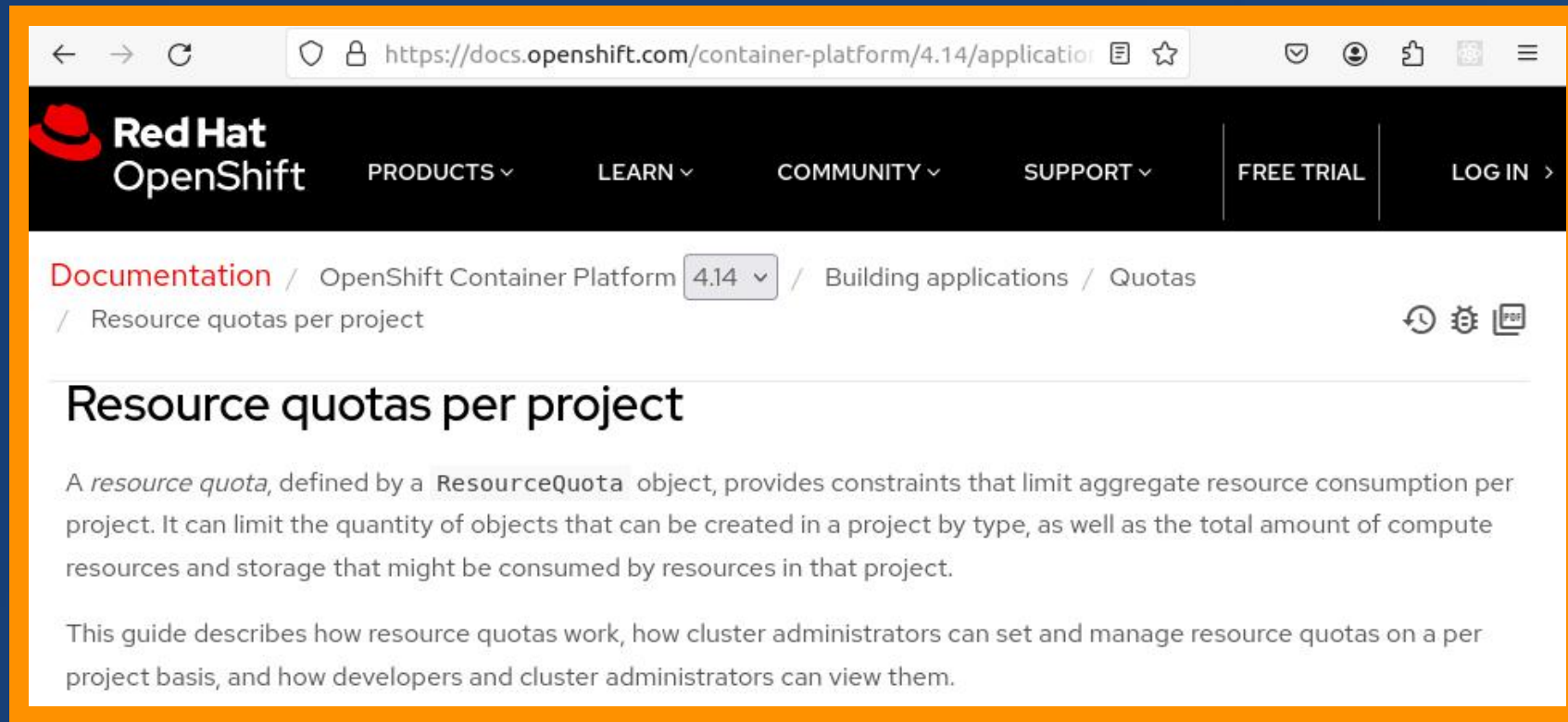
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 schmidt@atix.de

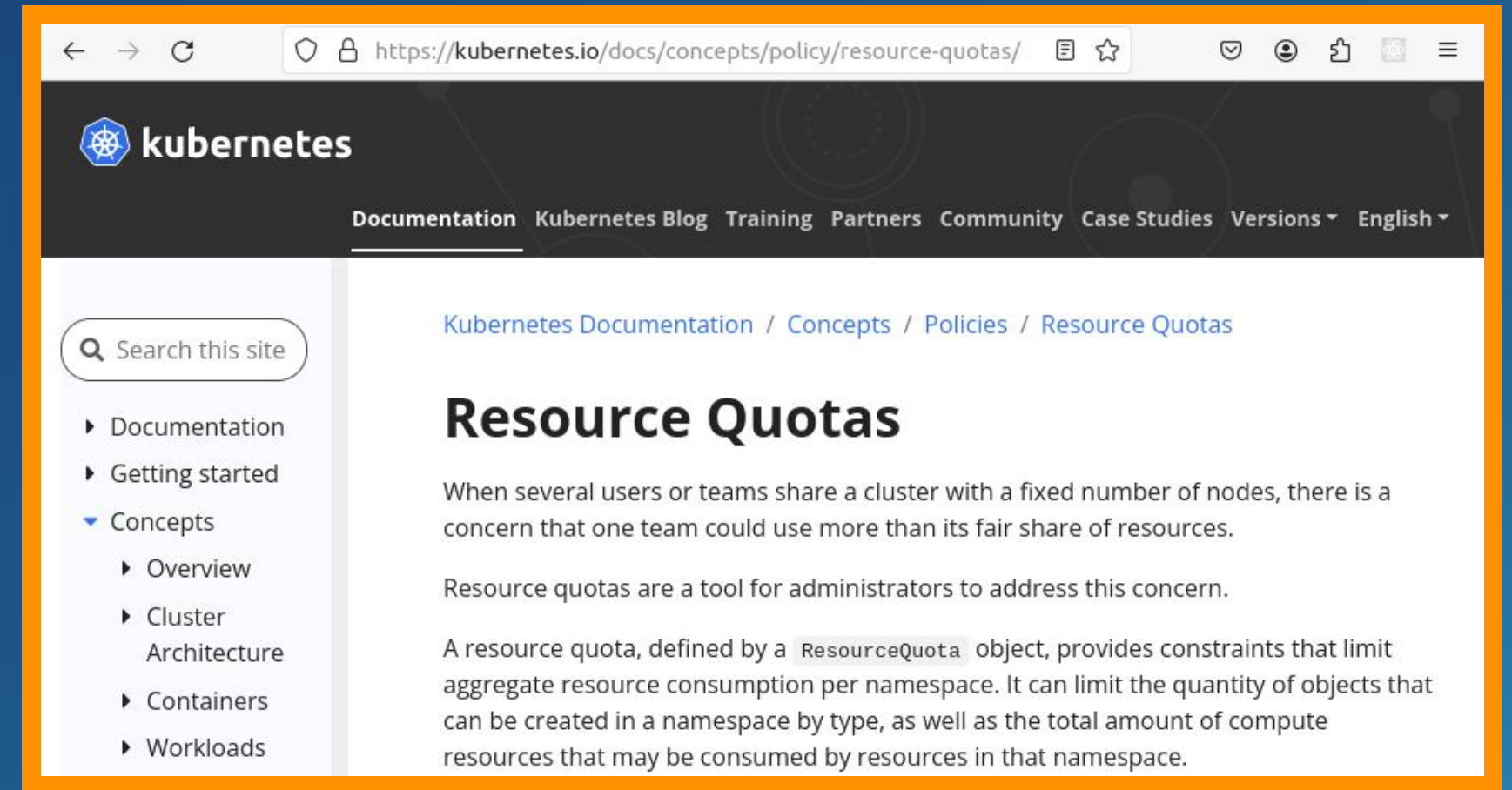


WHAT ARE RESOURCE QUOTAS?

What are Resource Quotas?

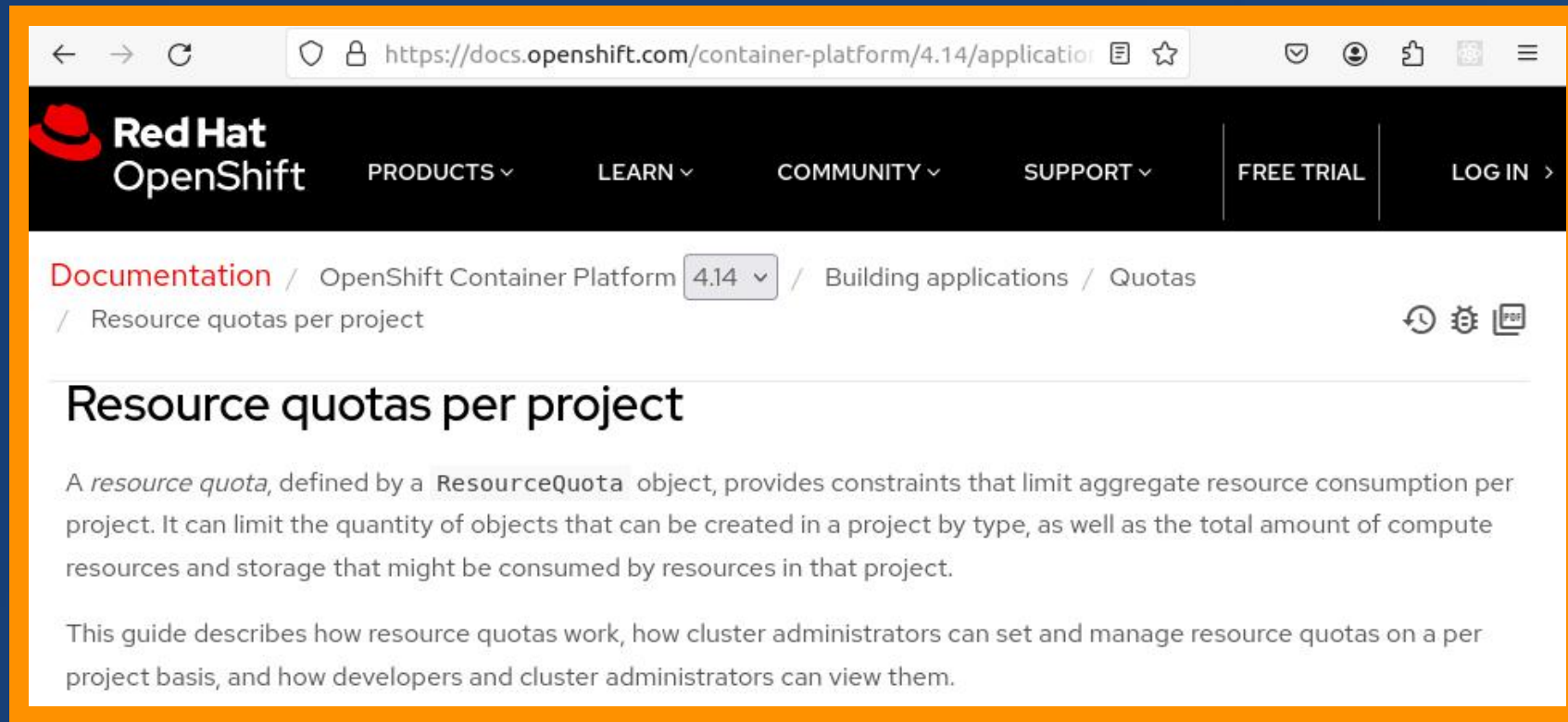


The screenshot shows the Red Hat OpenShift documentation page for "Resource quotas per project". The breadcrumb trail is: Documentation / OpenShift Container Platform 4.14 / Building applications / Quotas / Resource quotas per project. The page title is "Resource quotas per project". The main text explains that a resource quota, defined by a ResourceQuota object, provides constraints that limit aggregate resource consumption per project. It can limit the quantity of objects that can be created in a project by type, as well as the total amount of compute resources and storage that might be consumed by resources in that project. The guide describes how resource quotas work, how cluster administrators can set and manage resource quotas on a per project basis, and how developers and cluster administrators can view them.



The screenshot shows the Kubernetes documentation page for "Resource Quotas". The breadcrumb trail is: Kubernetes Documentation / Concepts / Policies / Resource Quotas. The page title is "Resource Quotas". The main text explains that when several users or teams share a cluster with a fixed number of nodes, there is a concern that one team could use more than its fair share of resources. Resource quotas are a tool for administrators to address this concern. A resource quota, defined by a ResourceQuota object, provides constraints that limit aggregate resource consumption per namespace. It can limit the quantity of objects that can be created in a namespace by type, as well as the total amount of compute resources that may be consumed by resources in that namespace.

What are Resource Quotas?



Red Hat OpenShift

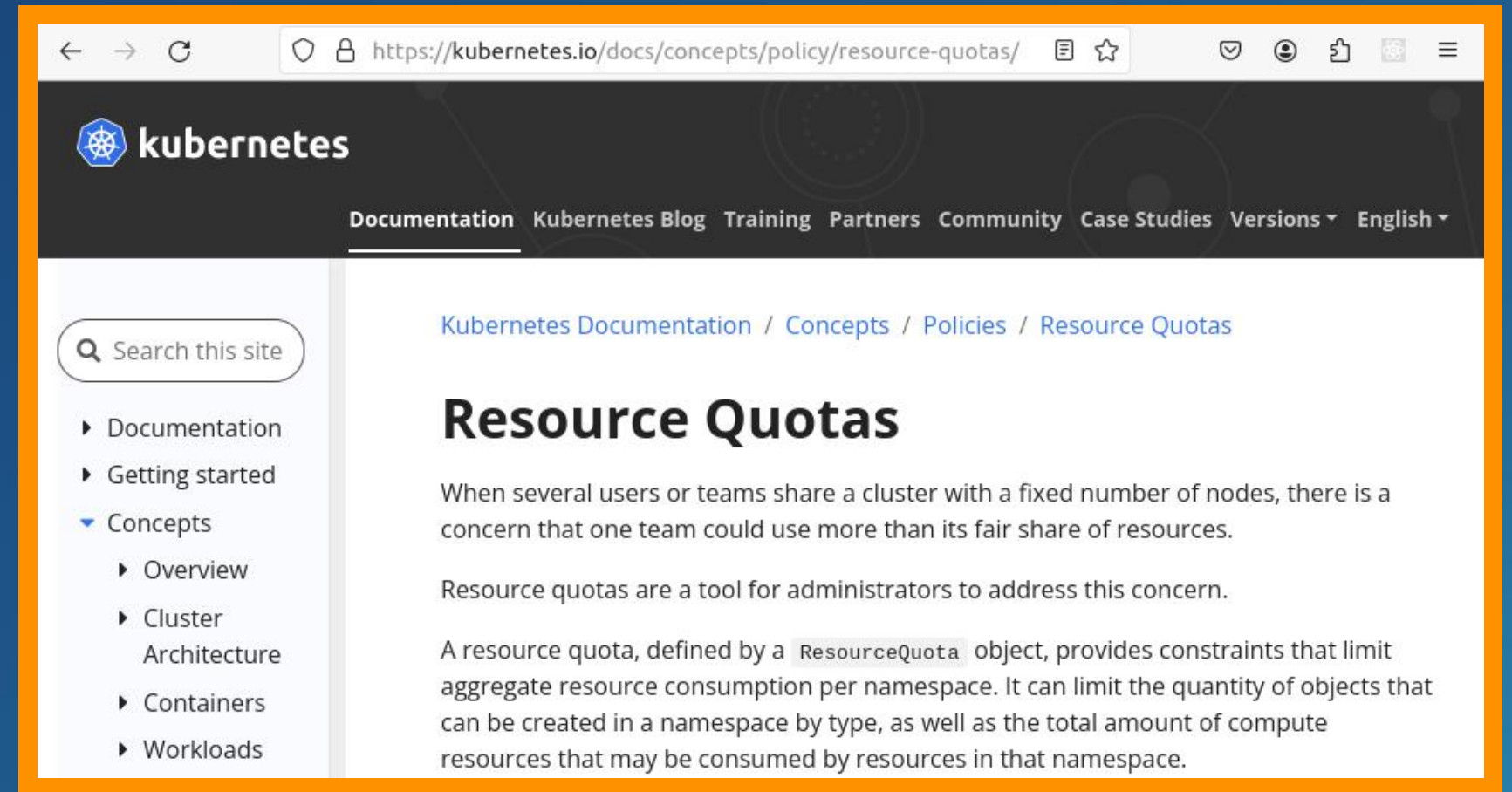
PRODUCTS ▾ LEARN ▾ COMMUNITY ▾ SUPPORT ▾ FREE TRIAL LOG IN ▸

Documentation / OpenShift Container Platform 4.14 ▾ / Building applications / Quotas / Resource quotas per project

Resource quotas per project

A *resource quota*, defined by a `ResourceQuota` object, provides constraints that limit aggregate resource consumption per project. It can limit the quantity of objects that can be created in a project by type, as well as the total amount of compute resources and storage that might be consumed by resources in that project.

This guide describes how resource quotas work, how cluster administrators can set and manage resource quotas on a per project basis, and how developers and cluster administrators can view them.



kubernetes

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Search this site

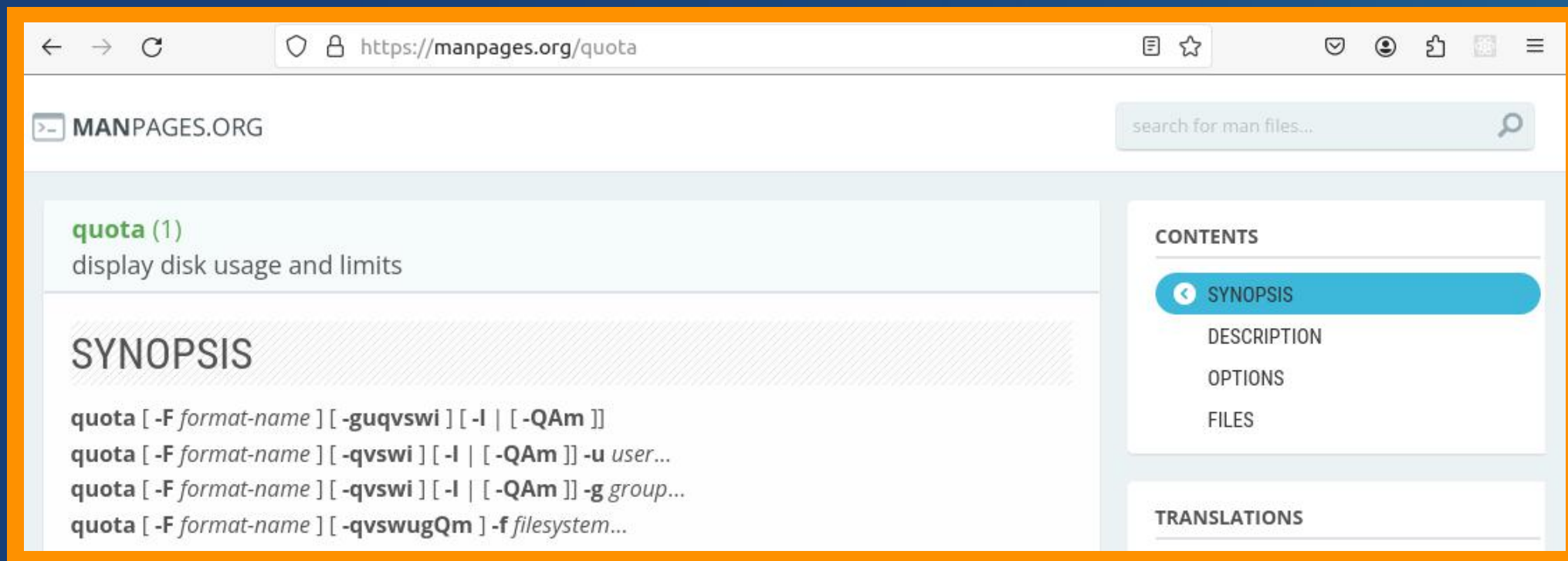
- Documentation
- Getting started
- Concepts
 - Overview
 - Cluster Architecture
 - Containers
 - Workloads

Resource Quotas

When several users or teams share a cluster with a fixed number of nodes, there is a concern that one team could use more than its fair share of resources.

Resource quotas are a tool for administrators to address this concern.

A resource quota, defined by a `ResourceQuota` object, provides constraints that limit aggregate resource consumption per namespace. It can limit the quantity of objects that can be created in a namespace by type, as well as the total amount of compute resources that may be consumed by resources in that namespace.



MANPAGES.ORG

search for man files...

quota (1)
display disk usage and limits

SYNOPSIS

```
quota [-F format-name] [-guqvswi] [-l | [-QAm]]
quota [-F format-name] [-qvswi] [-l | [-QAm]] -u user...
quota [-F format-name] [-qvswi] [-l | [-QAm]] -g group...
quota [-F format-name] [-qvswugQm] -f filesystem...
```

CONTENTS

- SYNOPSIS
- DESCRIPTION
- OPTIONS
- FILES

TRANSLATIONS

Resource Quota

Characteristics

- Limited number of resources
- Shared among several entities



Resource Quota

Characteristics

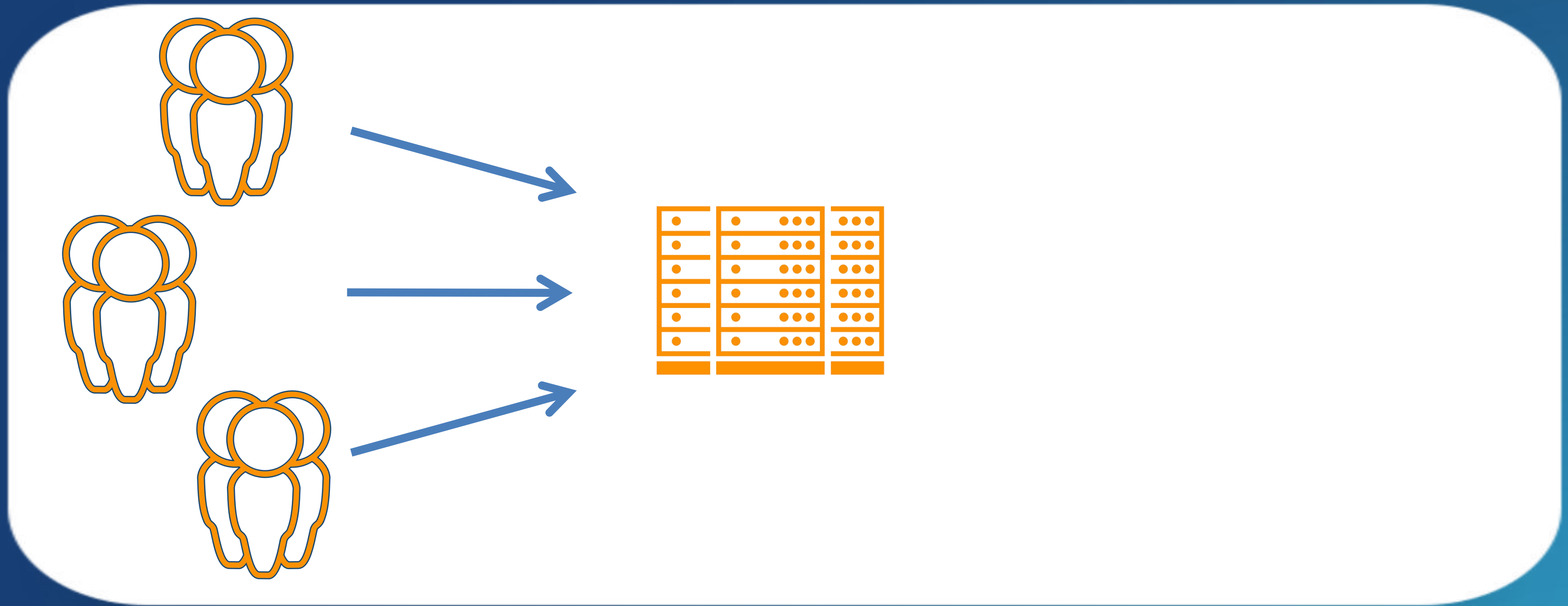
- Limited number of resources
- Shared among several entities

Goal

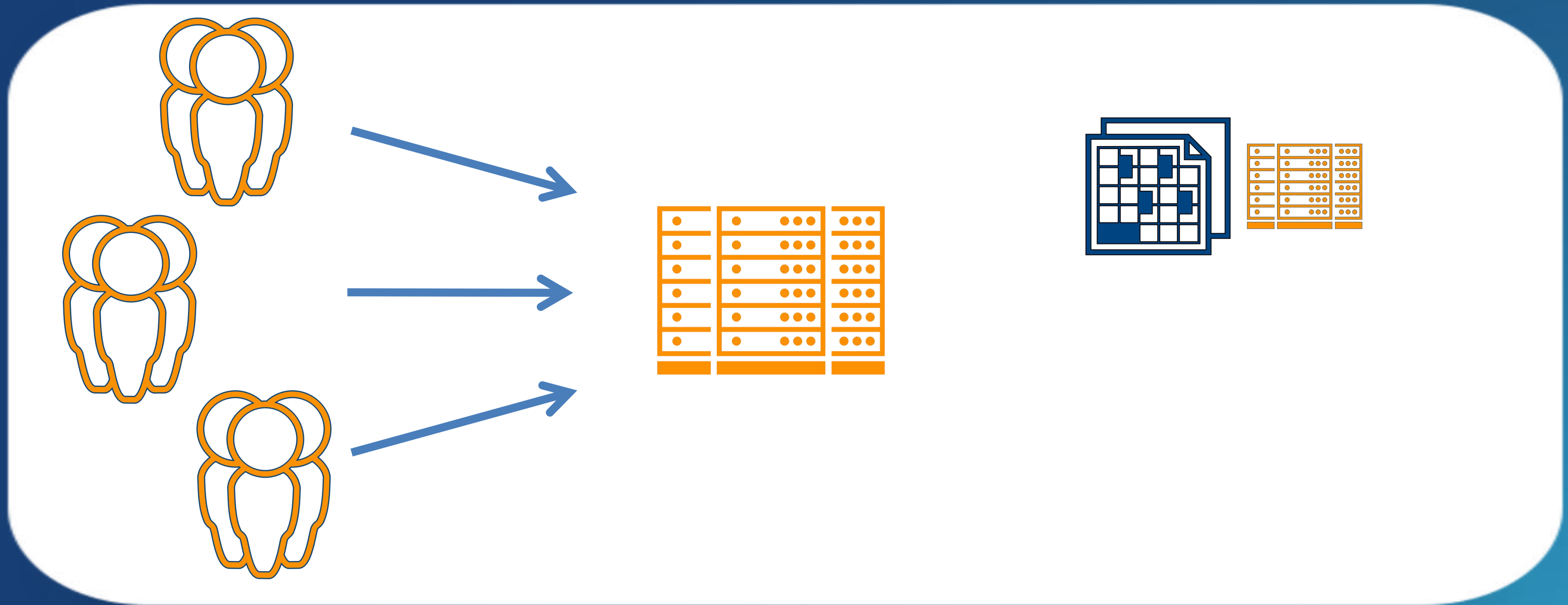
- Limit usage of shared resources per entity
- Allow fair collaboration



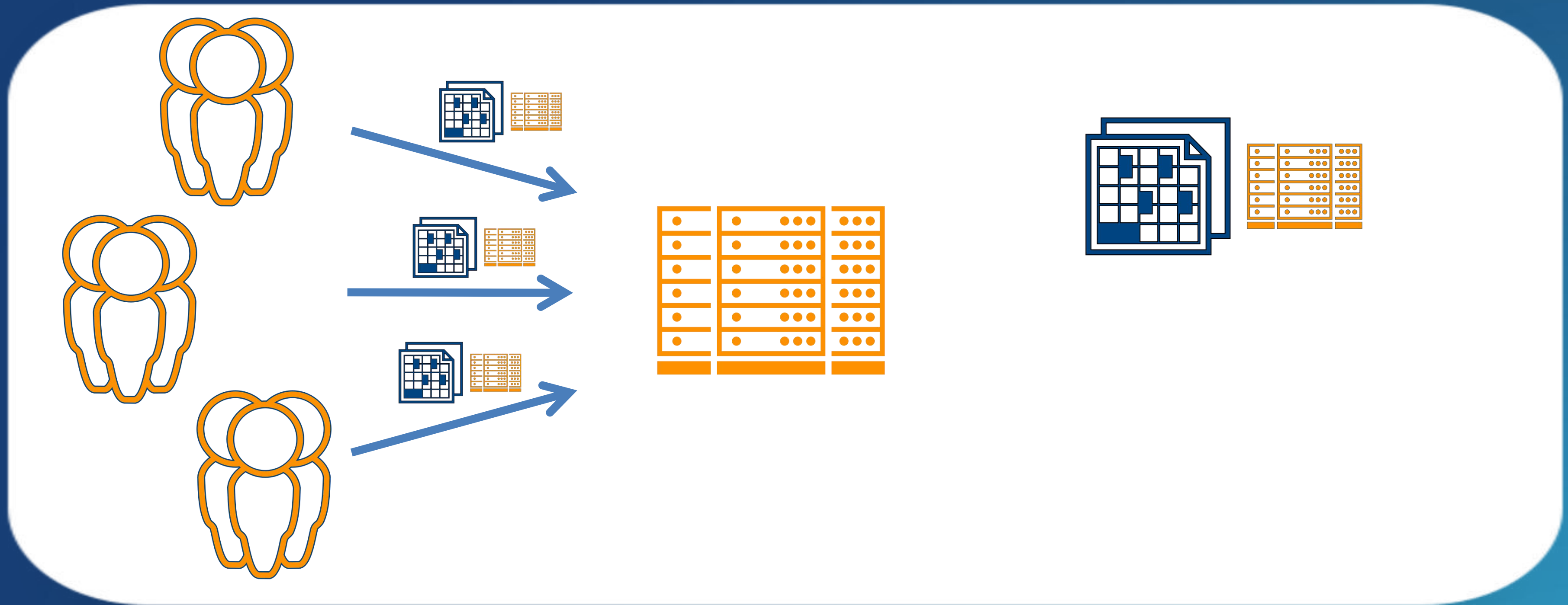
What are Resource Quotas?



What are Resource Quotas?



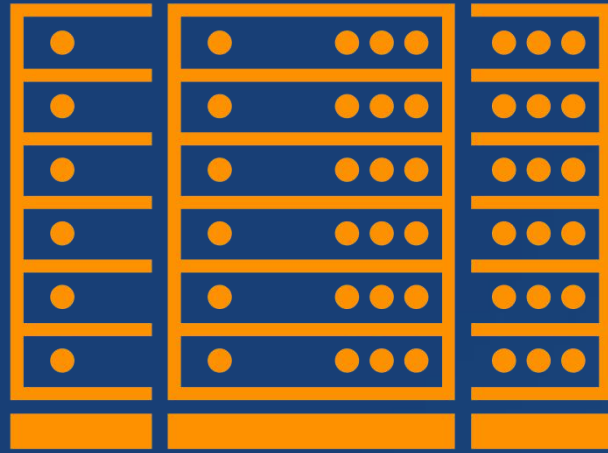
What are Resource Quotas?





RESOURCE QUOTAS IN FOREMAN

Resource Quotas in Foreman

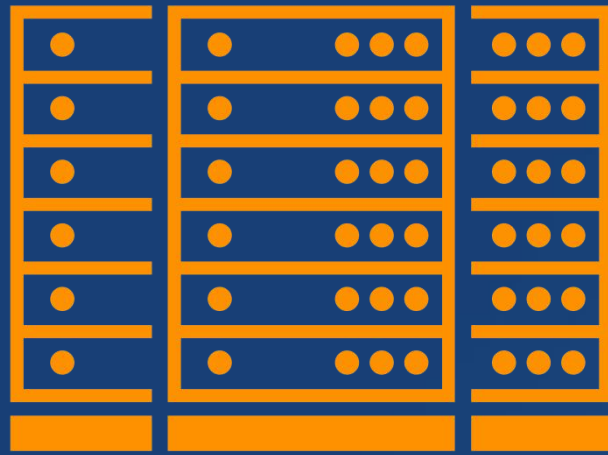


Resources



Entities

Resource Quotas in Foreman



Resources



Entities

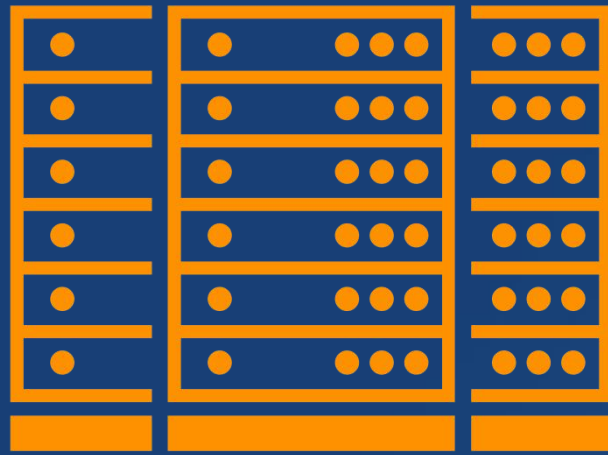


Host



- CPU cores
- Memory
- Disk

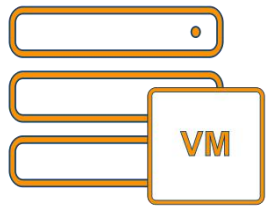
Resource Quotas in Foreman



Resources



Entities



Host

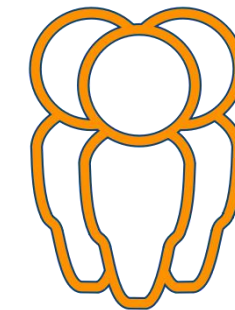


- CPU cores
- Memory
- Disk

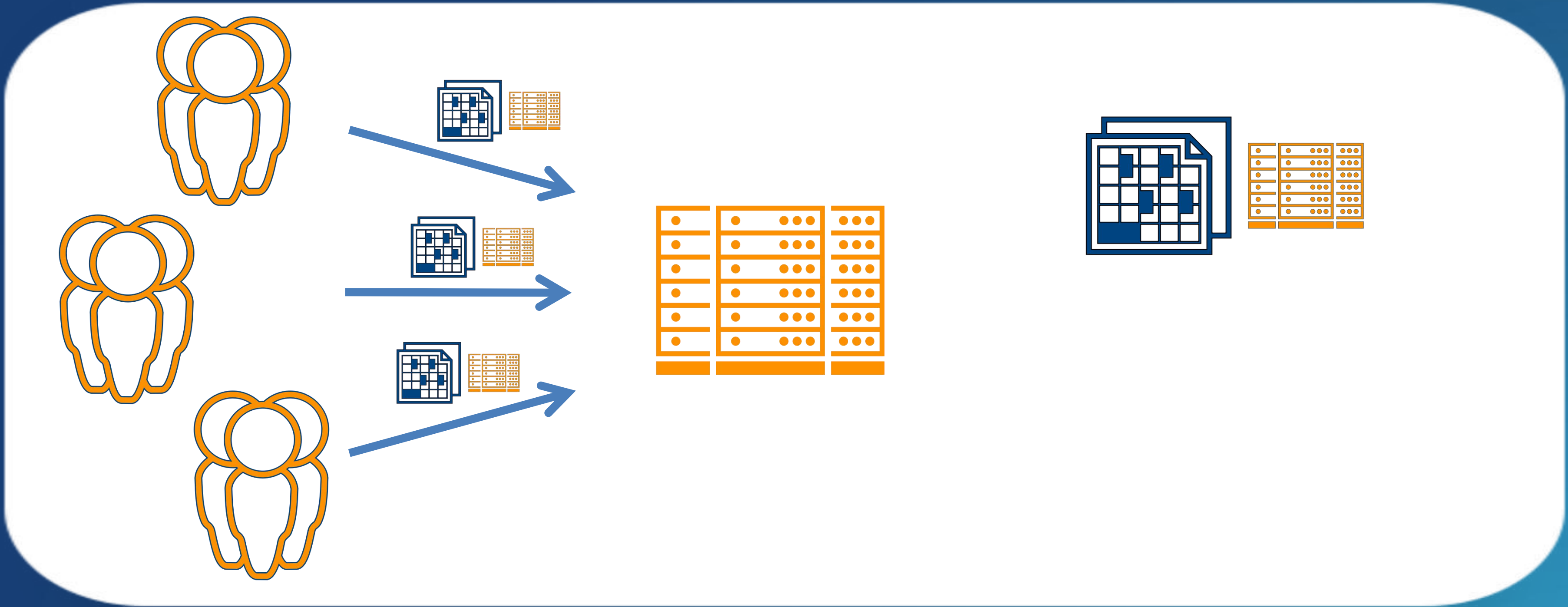
User



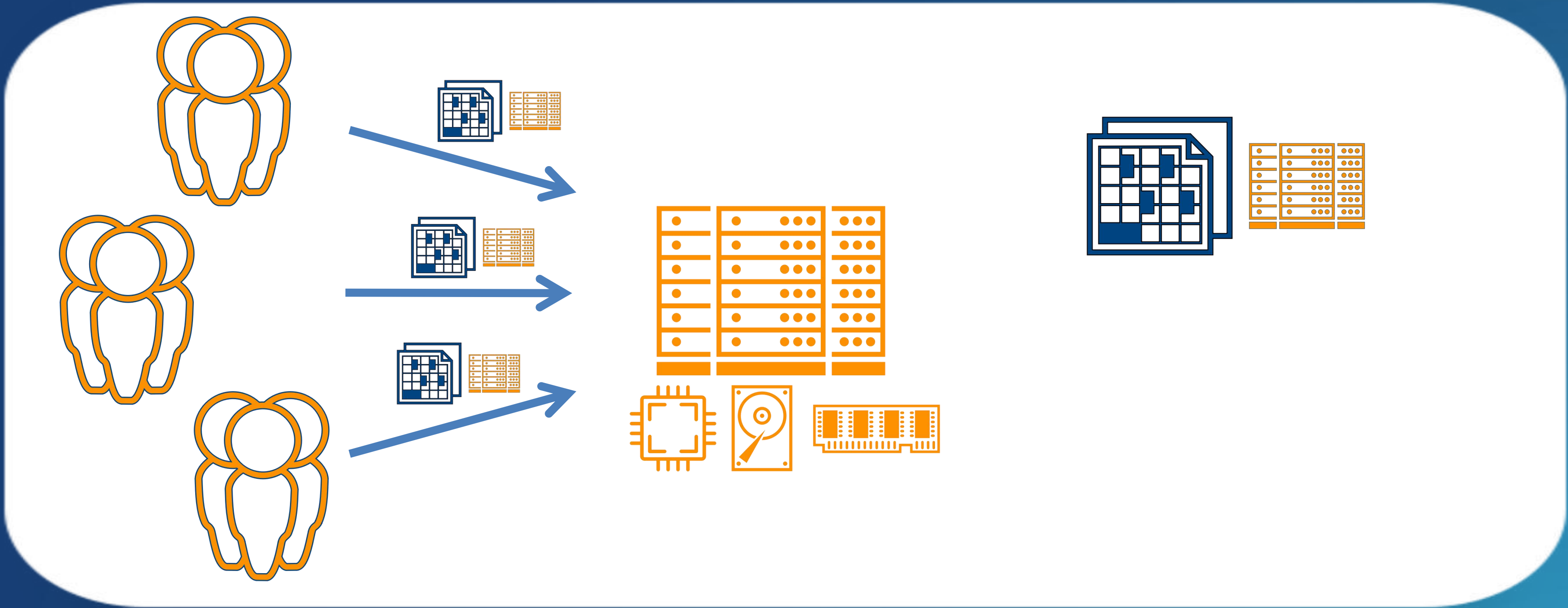
Usergroup



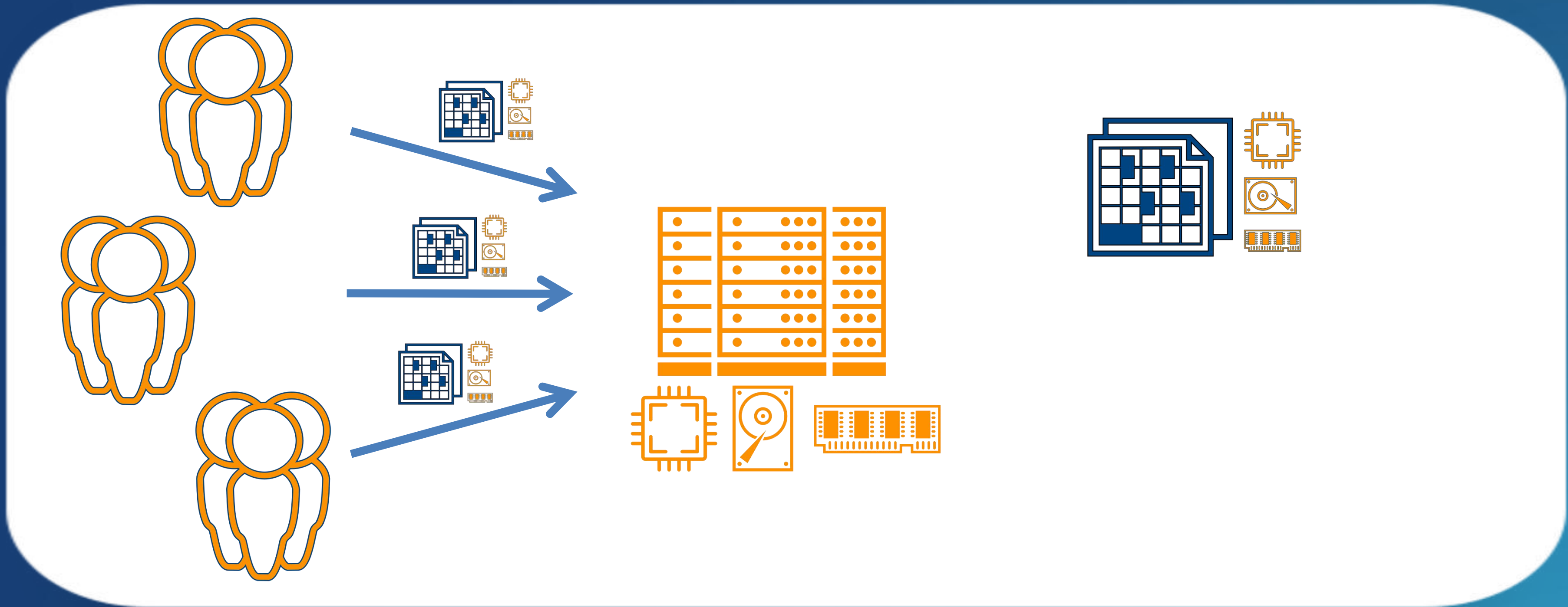
Resource Quotas in Foreman



Resource Quotas in Foreman



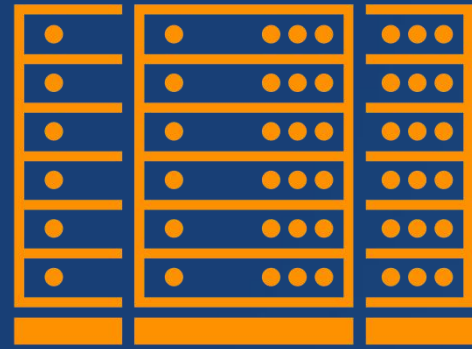
Resource Quotas in Foreman





DESIGN CONSIDERATIONS

Design Considerations



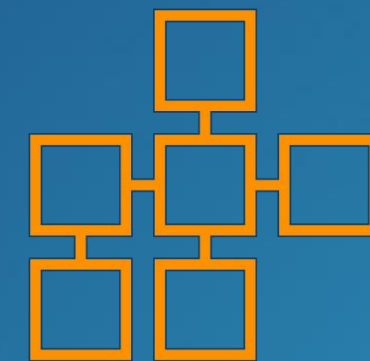
Resources



Entities



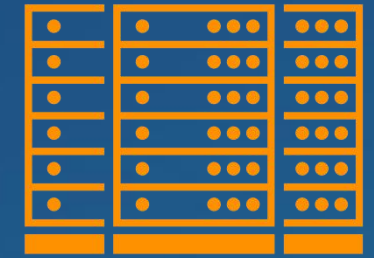
User Interface



Model

Resources

- **How** to retrieve a host's resource information?

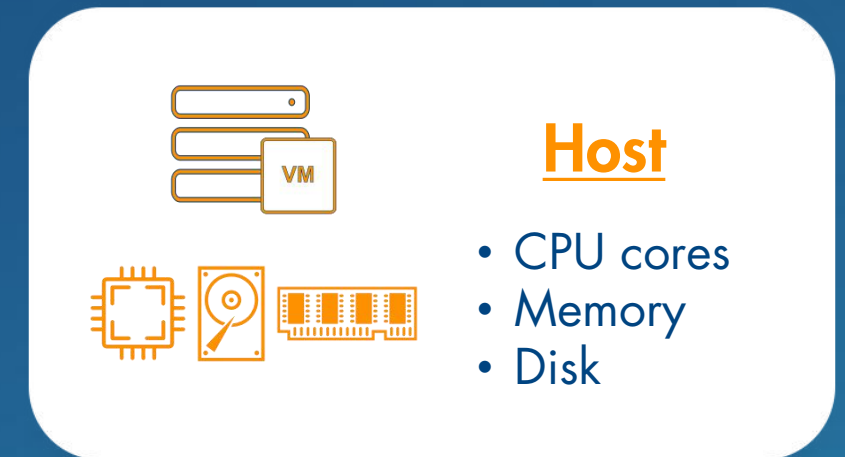
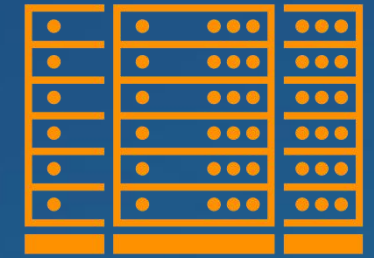


Host

- CPU cores
- Memory
- Disk

Resources

- **How** to retrieve a host's resource information?
- **Resource Origins:**
 - host.vm_attributes
 - Compute resource
 - host.facts



Entities

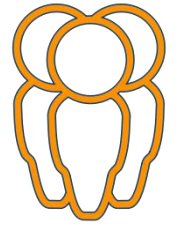
- Location **and** Organization?



User

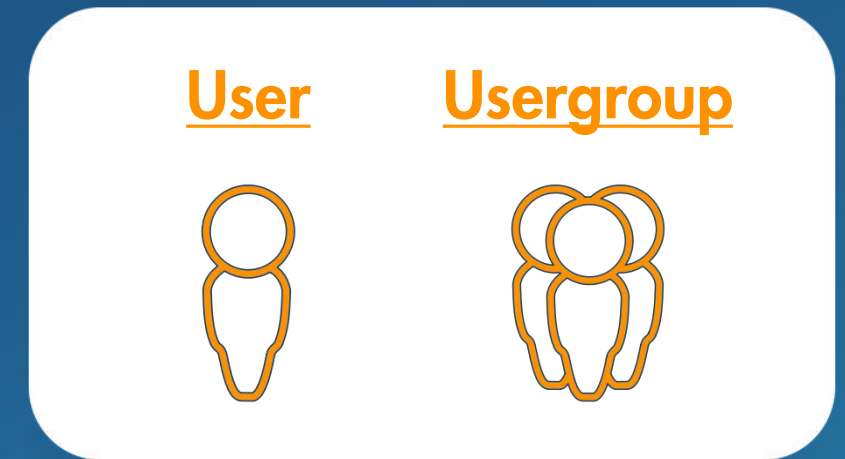


Usergroup



Entities

- Location **and** Organization?
- **More** precise assignment of resources
 - Restrict a group of users that are not part of the same organization
 - Restrict only a subset of the users in an organization



User Interface

- **Manage** Resource Quotas
 - Create
 - Edit
 - List

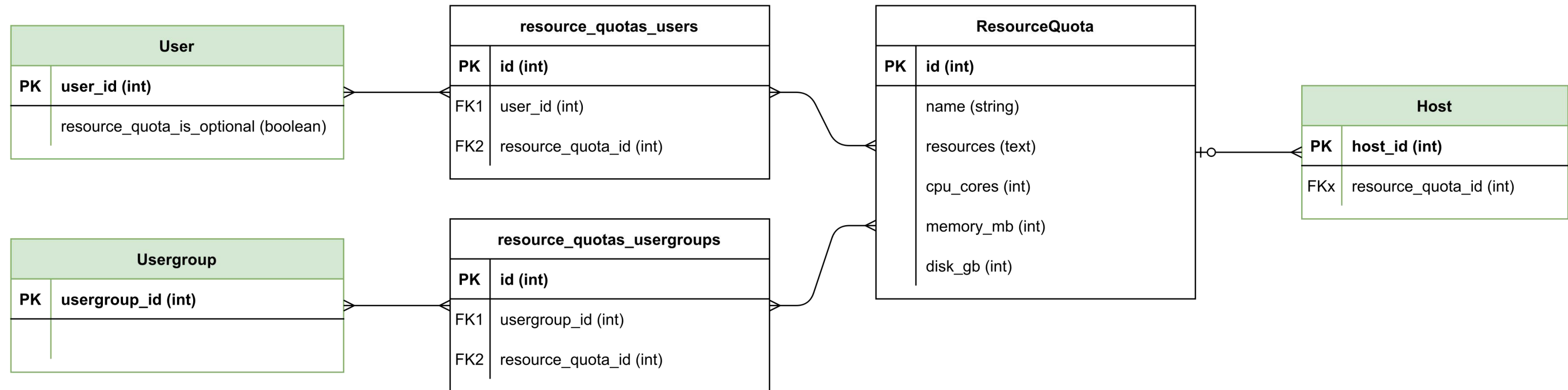
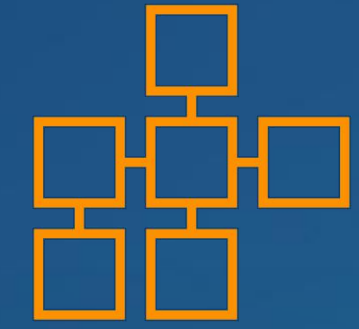


User Interface

- **Manage** Resource Quotas
 - Create
 - Edit
 - List
- **Assign** to Users/Usergroups
- **Assign** to Hosts



Model - Database





DEMONSTRATION

OUTLOOK

The background is a solid blue color with a complex network of white lines and dots. The lines connect various points, creating a web-like structure that resembles a molecular model or a data network. The dots are of varying sizes and are scattered throughout the background, some appearing as part of the network and others as isolated points.

Outlook

What comes next?

- 01 **Feedback**
- Collect feedback here
 - Integrate feedback from Foreman Discourse

Outlook

What comes next?

- 01 **Feedback**
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- 02 **Performance**
- Do not affect the host creation process
 - Async calculation of the quota utilization

Outlook

What comes next?

- 01 Feedback**
- Collect feedback here
 - Integrate feedback from Foreman Discourse

- 02 Performance**
- Do not affect the host creation process
 - Async calculation of the quota utilization

- 03 Publish it!!!**
- Packaging
 - Documentation

Come visit: https://github.com/ATIX-AG/foreman_resource_quota

Open Questions

- **Preview** quota utilization at host creation?
- **Bare** metal hosts?
- **What** if a host's resources could not be determined?
- **Assign** quotas to existing hosts and users? (hammer?)

