

Desktop Virtualization with Apache VCL

Orchestrating an academic cloud

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Overview

- What is Apache VCL?
- What does it do?
- How does it work?

What is the VCL?

- Dynamic provisioning of compute nodes
- Brokers access (via a web browser)
- Orchestration

Background

- Computing resources
- Licensed software

Computer Labs

CS lab
23 computers



Computer Labs

Biology
12 computers

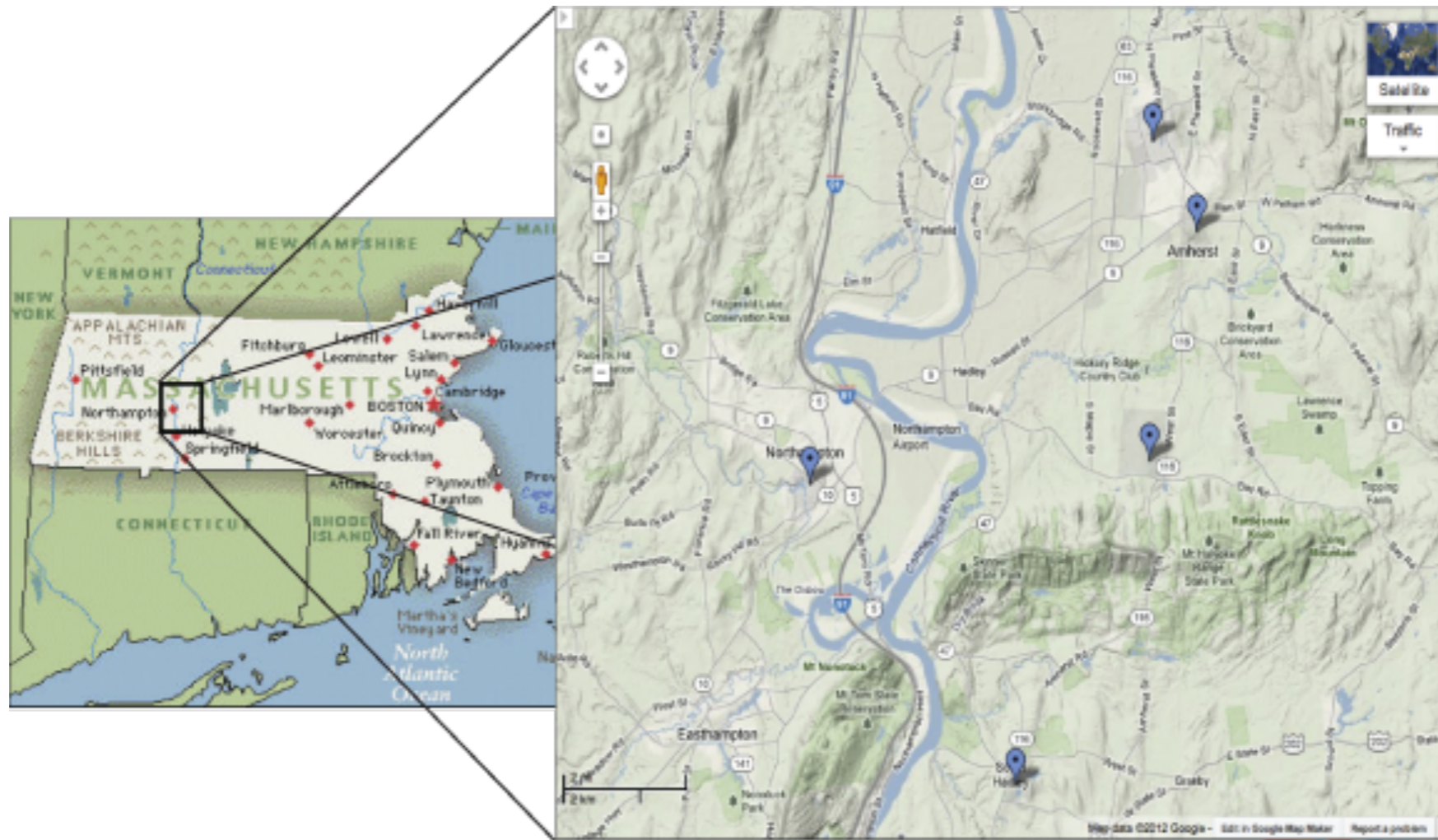


Computer Labs

GIS lab
8 computers



Five Colleges



Apache VCL

virtualization?

Apache VCL

dynamic provisioning?

Apache VCL

browser-based, self-service interface?

Apache VCL



Compute
Node

Compute
Node

Compute
Node

Compute
Node

Compute
Node

how does the VCL work?

Terminology

Image = computing environment

Reservation = request for an image

Resource = a compute node or image

Resource Groups



Image groups

The diagram consists of three ovals arranged in a triangle. The top oval is light blue and contains the text 'Image groups'. The bottom-left oval is light blue and contains the text 'User groups'. The bottom-right oval is light purple and contains the text 'Computer groups'. The ovals are connected by a series of wavy lines at the bottom of the slide, which are colored in shades of blue, red, and orange.

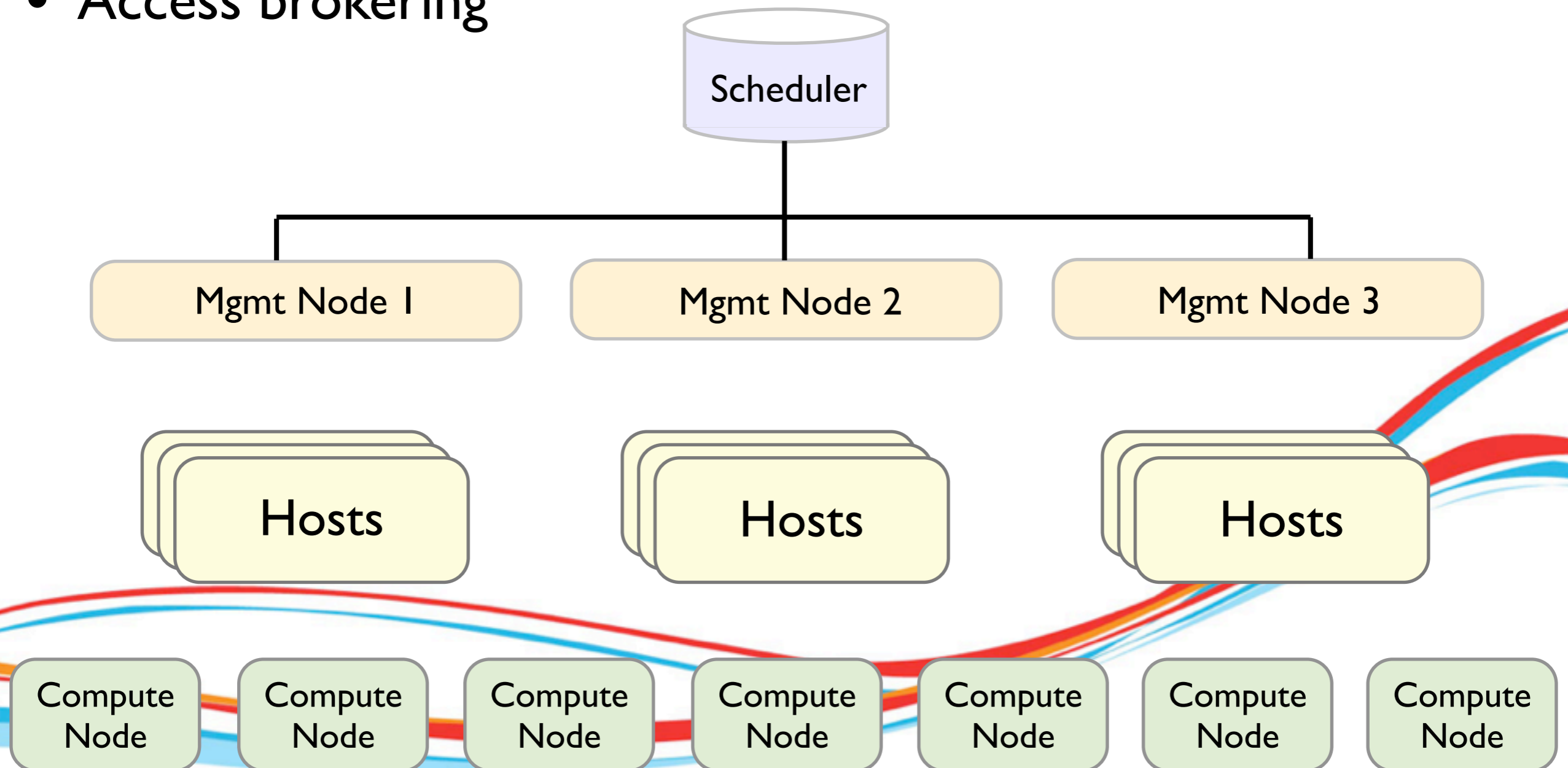
User groups

Computer
groups

Web Interface

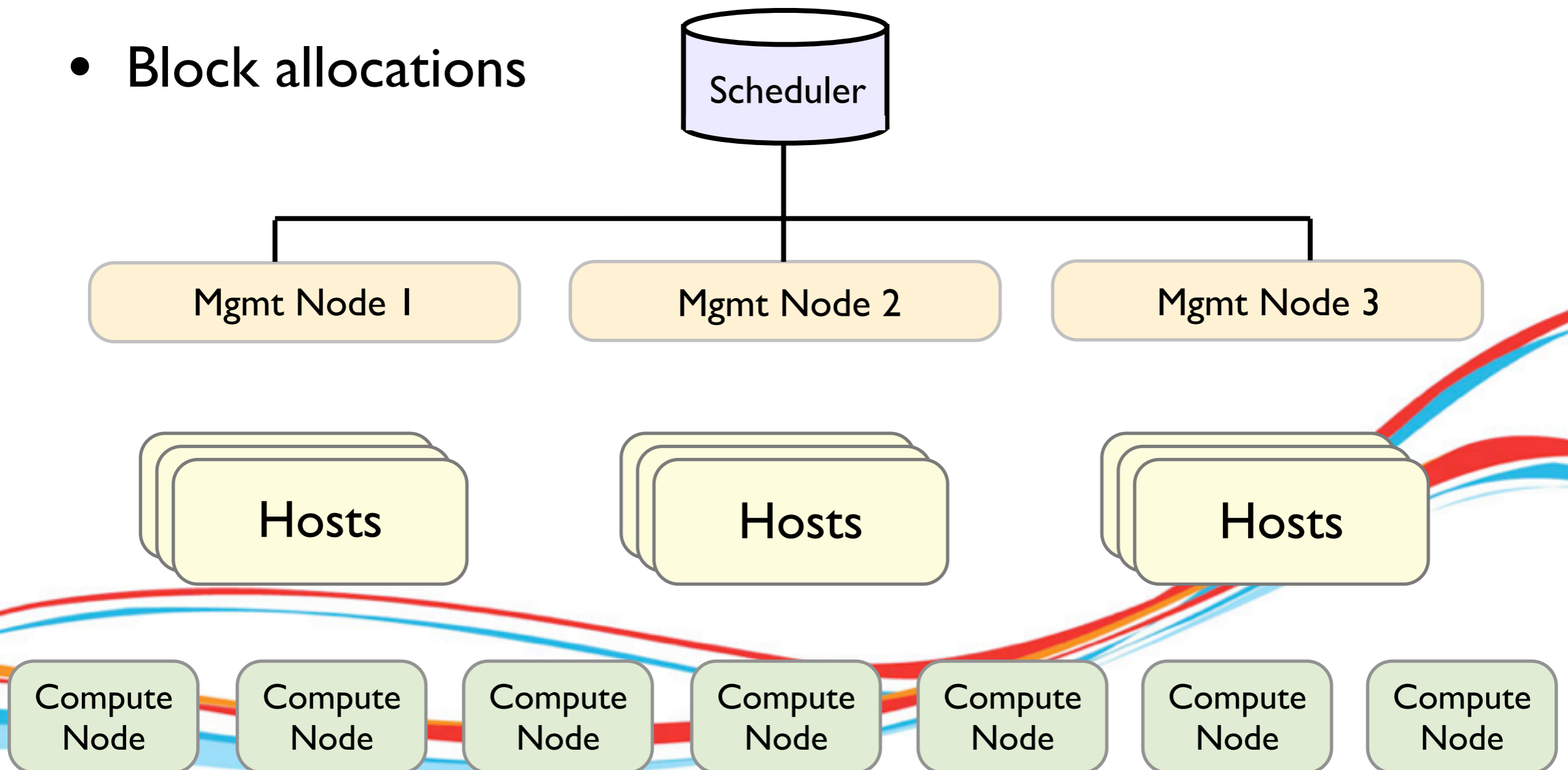


- Authentication
- Access brokering



Scheduler

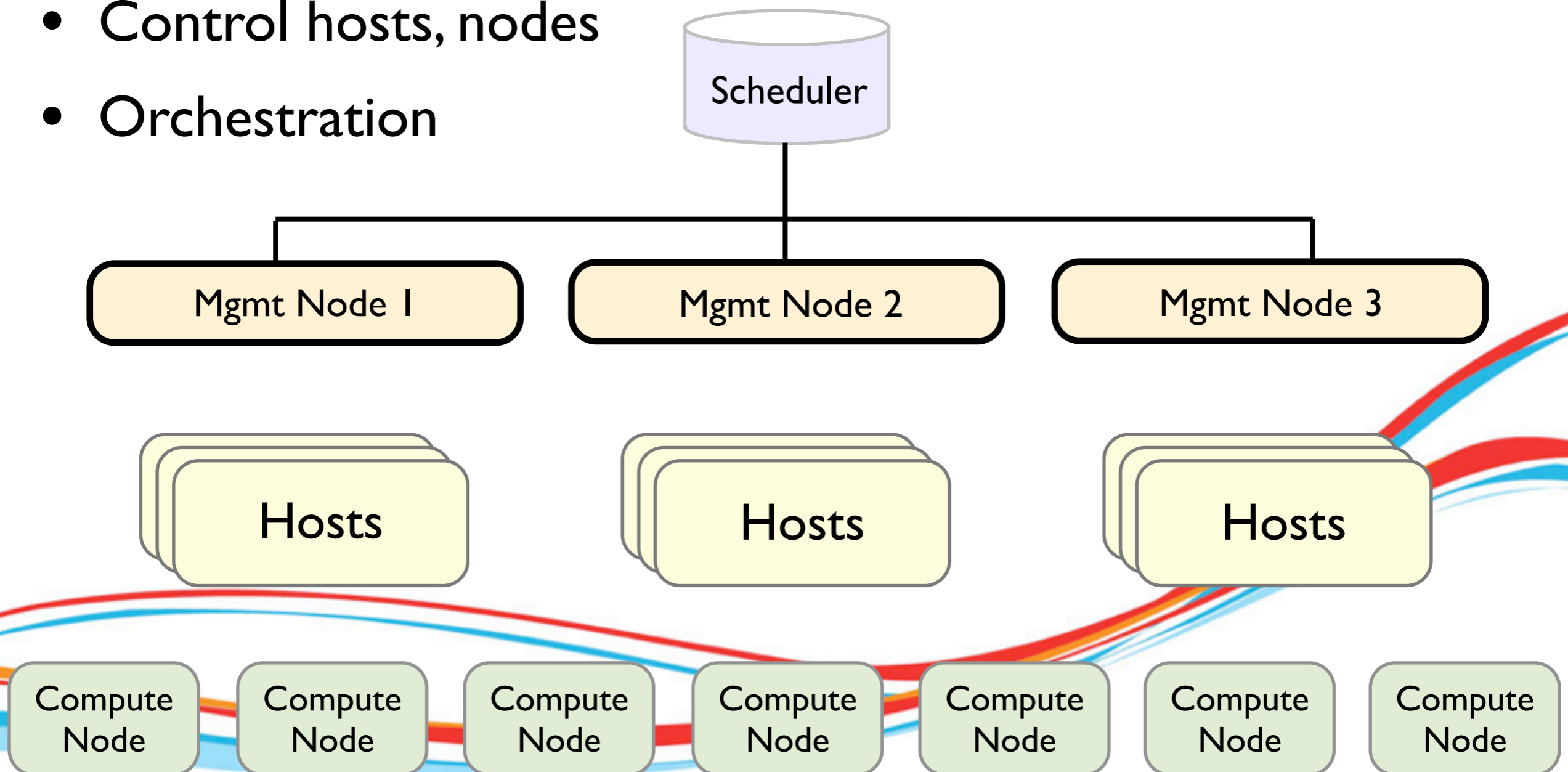
- Node state
- Reservations
- Block allocations



Management Nodes

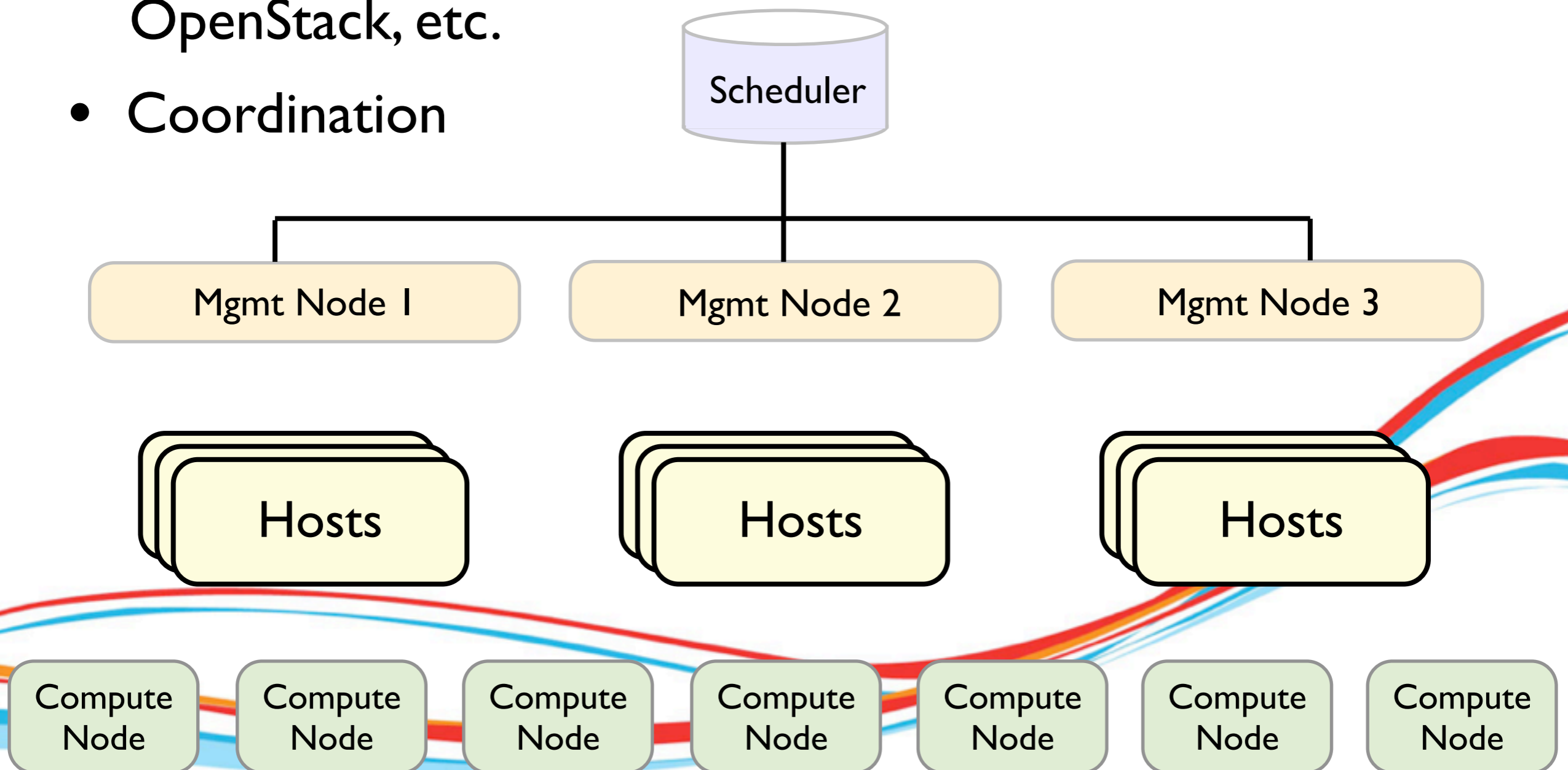


- Load images
- Control hosts, nodes
- Orchestration



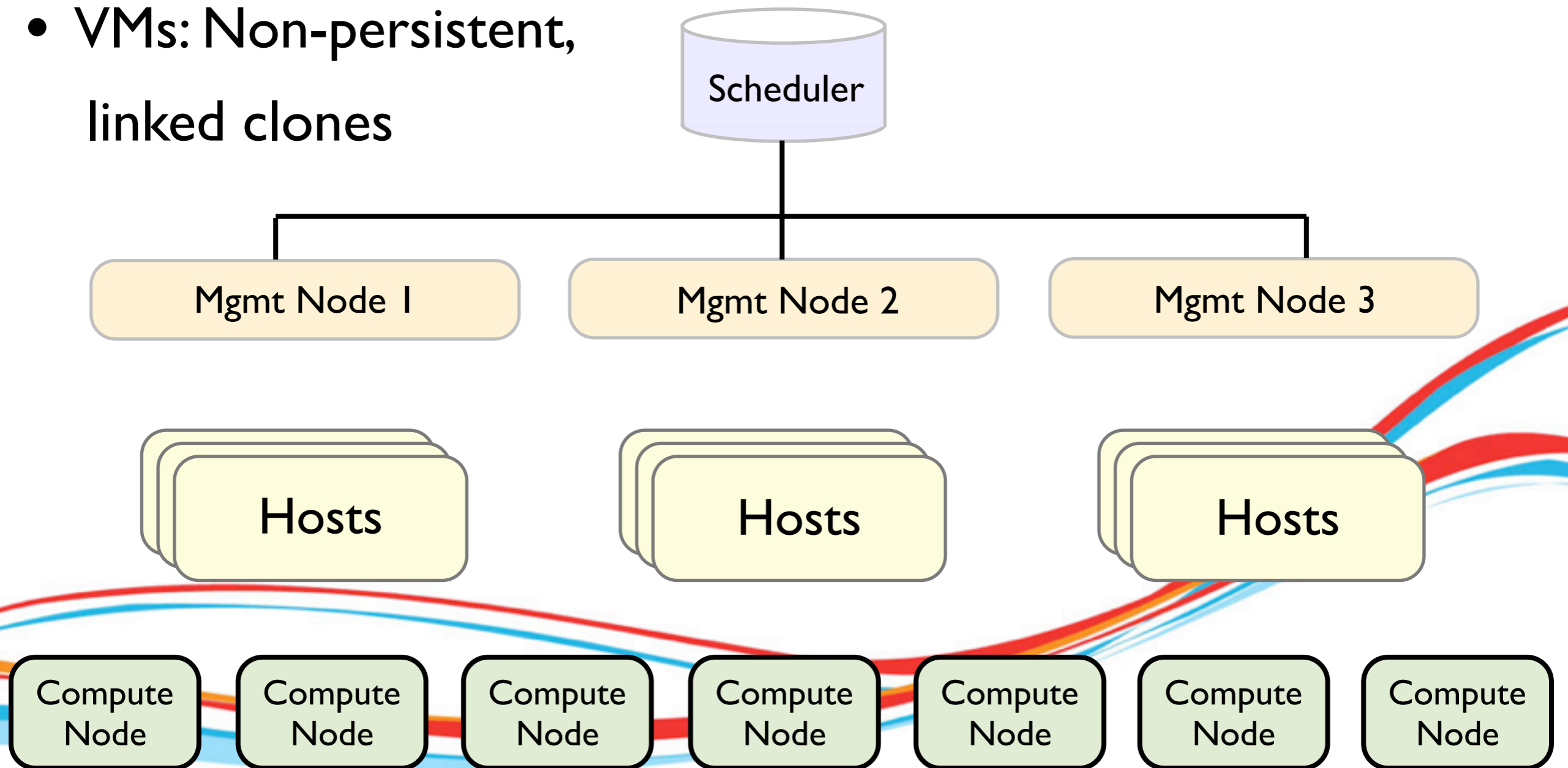
Hosts

- Bare Metal
- VMware, KVM, OpenStack, etc.
- Coordination



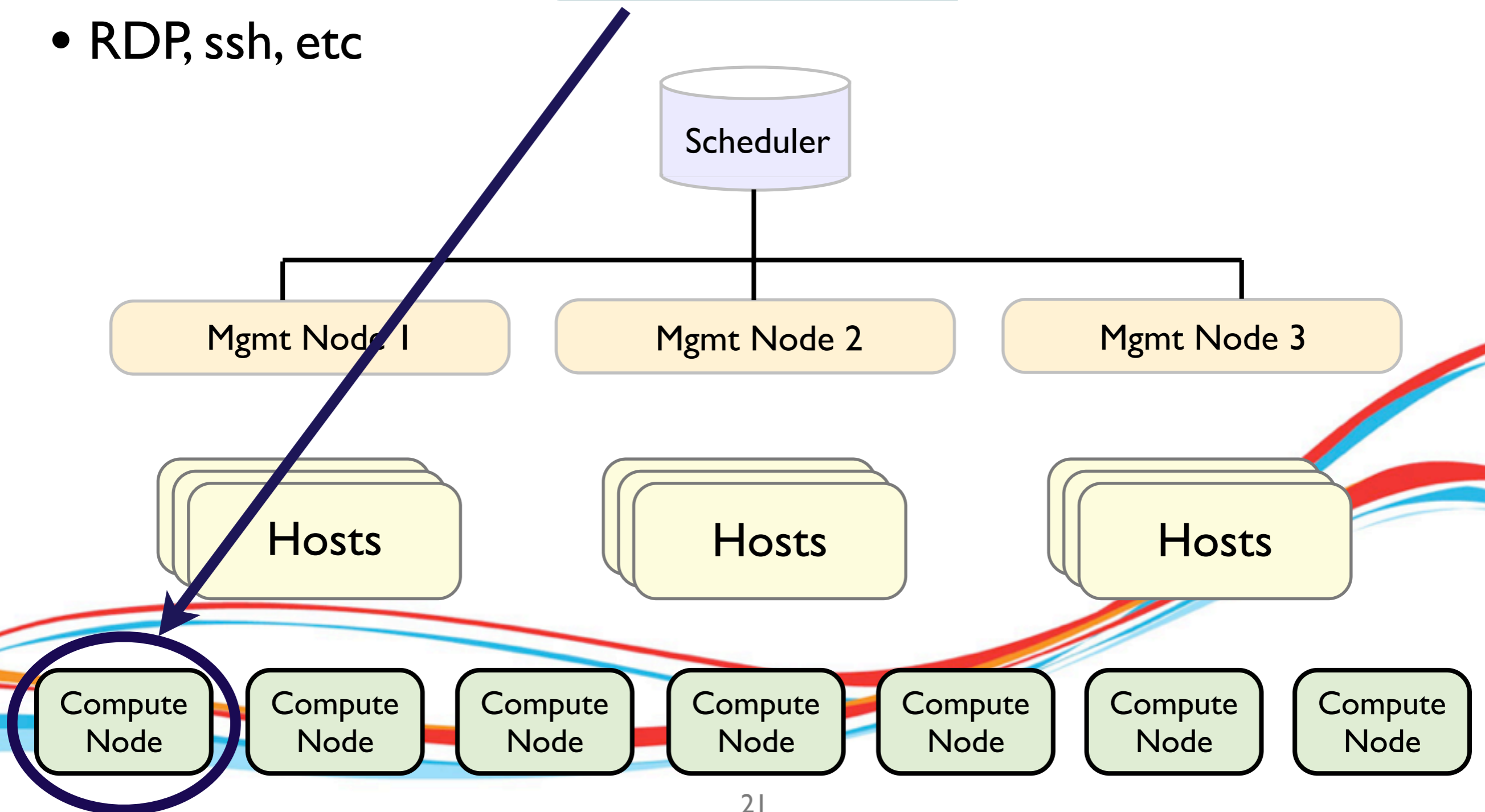
Computers

- Windows, Linux, HPC, MacOS(?)
- VMs: Non-persistent, linked clones



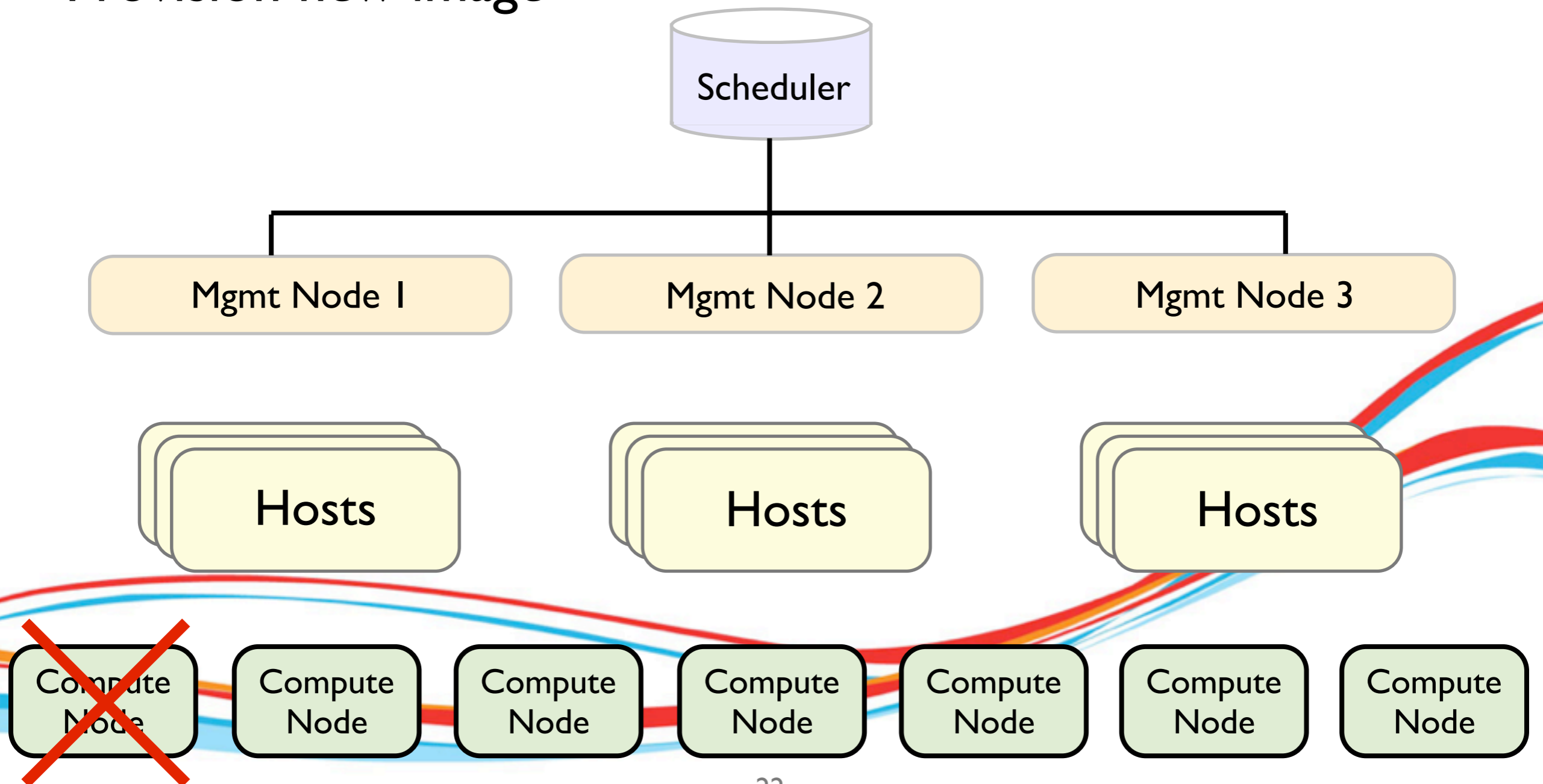
Reservation

- Remote access
- RDP, ssh, etc



Reservation

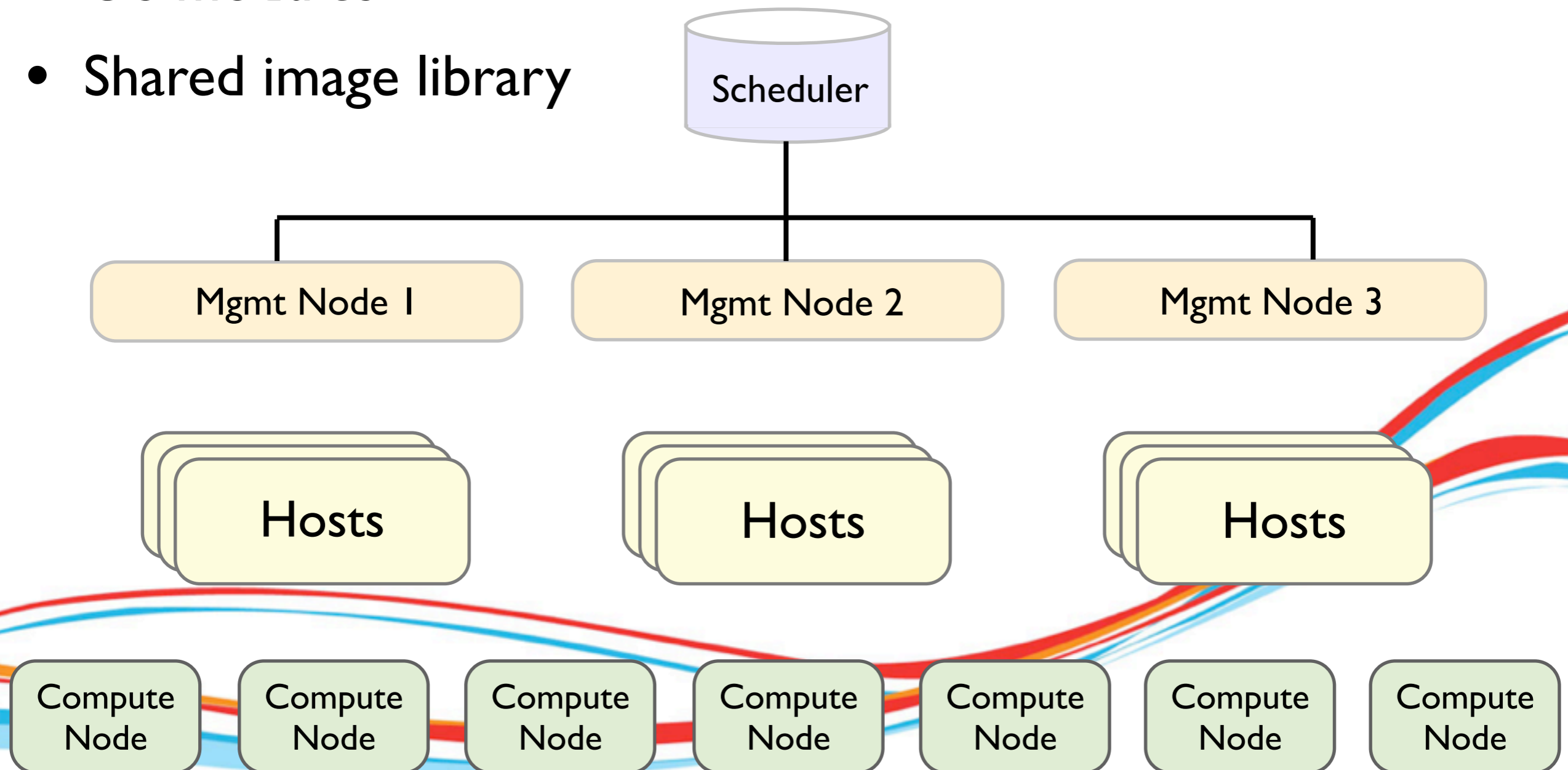
- Return node to pool
- Provision new image



Orchestration



- Image capture
- OS modules
- Shared image library



VM Performance

- I/O latency (Windows VMs)
- load balancing VMs across hosts
- oversubscribing VM hosts

Future directions

- support for EC2 API
- support for OpenStack
- ESX OS for end users
- policy-based broker tool
- power management

questions?

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