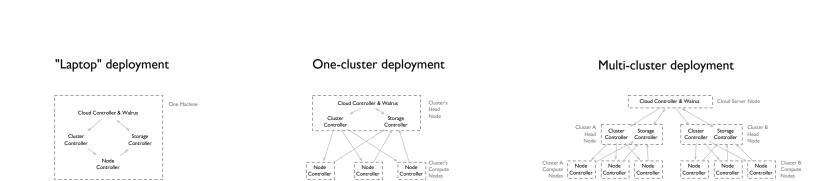
The user can interact with the system through Two types of storage services are available to **Eucalyptus Architecture** (as of 1.6.2) several interfaces: Eucalyptus users: Eucalyptus software components are organized The Web interface enables account management Key-value storage, where a key is associated with a into three tiers: (user sign-up, downloading of user credentials, "bucket" of data (a flat collection of files), is account configuration) and supports basic queries implemented by a top-level component named Top-level components provide entry points into the Walrus, which is interface compatible with (e.g., listing of images and instances). system over standard protocols. Cloud Controller Amazon's S3 service. The buckets are accessible performs cloud-wide management (of users, keys, both from outside and from within the cloud, from HTTP-based SOAP and Query/REST-style interfaces VM instances, disk images, clusters, etc.) as well as any cluster. Disk images uploaded into Walrus can enable full control of execution, network, and resource provisioning and scheduling. be used for booting VM instances. storage, either through command-line tools or programming libraries. Cluster-level components mediate between the top-Block storage - akin to a traditional disk partition level components and the nodes of a particular is implemented by a cluster-level component Administrators use the same interfaces with cluster, which may be behind a two-way firewall. named Storage Controller. The controller stores additional powers. Cluster controller, in particular, abstracts resources volumes of disk blocks, which can be captured at of a cluster so as to simplify cloud-wide scheduling. any point in time as snapshots. Snapshots are forwarded to Walrus for storage. Although a Each cluster node designated for hosting VM volume can only be used by VMs within a cluster in instances runs a node controller, which manages the which the volume was created, through a snapshot instances running on it as well as their storage. a volume's data can be replicated across clusters. The components communicate using either SOAP with WS-security or REST with signatures. EC2 tools S3 tools Cloud Web Se Web Server Walrus Controller Query Interface **SOAP** Interface **REST Interface SOAP** Interface Web Interface Users EC2 Compatibility Layer S3 Compatibility Layer Top-level Components Key-pairs, Location Key-pair Image & Block Group lmage General Buckets. Storage Manager Manager **Broker** Manager **ACL** Engine Metadata Image Buckets, Manager Snapshot Buckets Instance Control SLAs, Cluster Metadata Web Server Instance, Resource, Network Queries Image Management Instance Control Walrus Configuration Network Control Address Assignment Volume Management Volume Control Console Output Snapshot Management Storage Configuration Network Cluster Web Server Web Server Storage Controller Controller Instance Resource Network Volume & Storage Control Discovery Control Snapshot Manager Cluster-level Components Network Volumes, Instance Resource Snapshots Snapshot & Metadata Cache Cache Metadata Instance, Resource Queries Snapshot Management Instance Control Network Control Private or Public Volume Control **Ethernet Network** Console Output Power Management Node Web Server Controller Resource Instance Network Storage Control Discovery Control



Network

Metadata

Also, within each component:

Authentication Subsystem

- Logging Subsystem

Node-level

Component

Instance

Metadata

Cache

KVM

Adapter

Resource

Metadata

Cache

Image Retrieval

Image

Cache,

Running

Images