StratusLab

Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

Cloud Storage: Disk and File-based Abstractions

The project will provide cloud storage services with both disk- and file-based abstractions. Disk-based abstractions allow both read-only distribution of disk images through the StratusLab Marketplace and persistent read-write disks within a particular cloud instance.

The project will also provide file-based storage services (likely with CDMI interface) to allow the storage and (potential) sharing of files within and between clouds. Grid users can continue to use the standard SRM interfaces for files stored on the grid.

File-Based Storage

For an IaaS cloud like StratusLab, the most natural abstraction is a disk. However for scientific analyses, file-based abstractions are often more convenient.

After v1.0, the project will provide file-based storage, probably with the CDMI interface proposed by SNIA.

Users can continue to use standard file-based grid services.

Shared Read-Only Disks

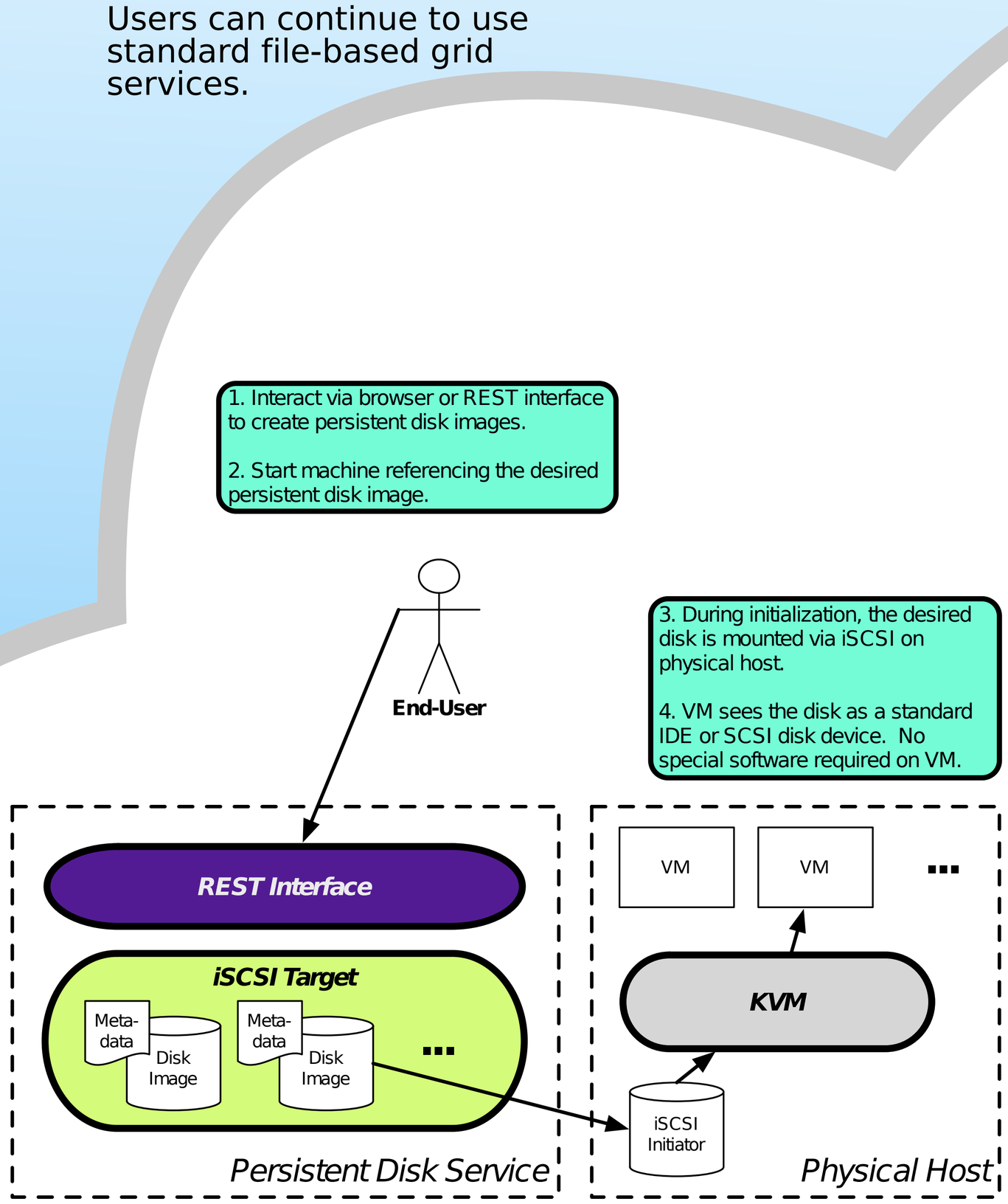
It is often useful to share datasets via read-only disks. This allows caching of these disks and sharing between different cloud instances. It also permits users to use specific versions of the database for their analyses.

These are supported though the standard Marketplace mechanisms.

Persistent Disks

These may be created and used by a single machine instance within a single cloud. They are useful for saving the persistent state of services.

Eventually snapshotting of these images will be provided.



Using a Persistent Disk

1. Create a disk with a given size via the web or REST interface.

2. Launch a machine instance referencing that disk image.

3. Partition (fdisk) and format (mkfs) the disk via the running virtual machine.

4. Store data to the disk as usual.

5. Dismount the disk or halt the machine instance.

6. Disk with the persistent data is available for use by another machine instance.

Using a Shared Read-Only Disk

1. Launch a machine giving the Marketplace reference for the image.

2. Machine is launched with the given disk image on the given device (typically /dev/hdd).

3. Mount the disk on the machine and use the data for an analysis.

4. Dismount or halt the machine instance.

The disk is read-only and no changes can be made to the disk image.

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