Persistent Storage

StratusLab Tutorial (Orsay, France)

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Persistent Disk (Volume)

*Use: Persistent storage of data with lifecycle independent of a single virtual machine instance.*

Workflow

- Create a disk with a given size via command line or web interface
- Launch a machine instance referencing that image
- Format (`mkfs`) the disk via the running VM
- Store data to the disk as usual
- Unmount the disk
- Halt the machine instance or detach disk from machine
- Disk with persistent data is available for use by another VM

Only format disk the first time it is used!

Persistent Storage Architecture

1. Interact via browser or REST interface to create persistent disk images.

2. Start machine referencing the desired persistent disk image.
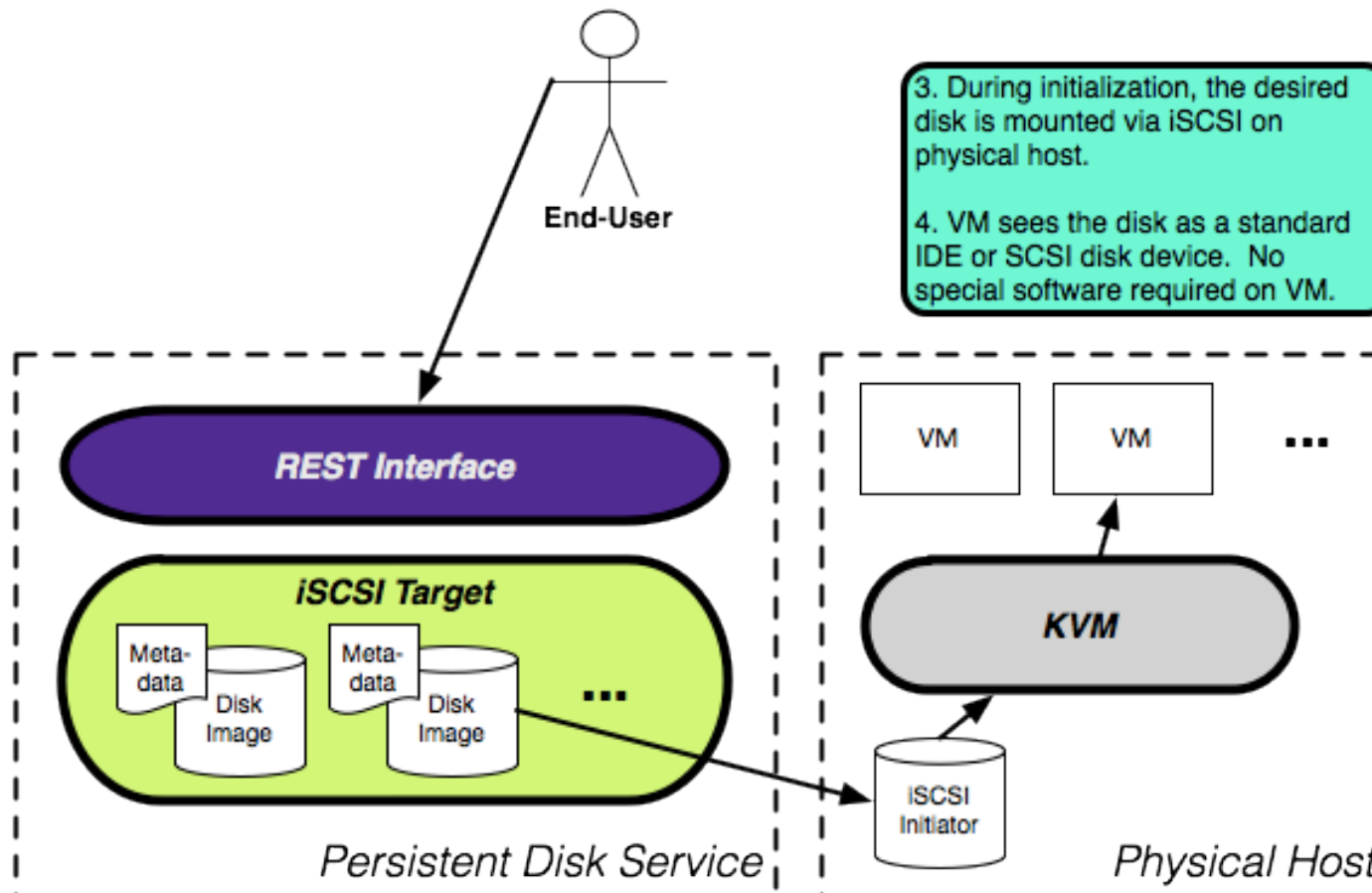
3. During initialization, the desired disk is mounted via iSCSI on physical host.

4. VM sees the disk as a standard IDE or SCSI disk device. No special software required on VM.

End-User

REST Interface

iSCSI Target

Meta-data

Disk Image

Meta-data

Disk Image

...

Persistent Disk Service

VM

VM

...

KVM

iSCSI Initiator

Physical Host

Using a Persistent Disk

Client Configuration

- Persistent disk service endpoint defaults to VMM endpoint
- If on another machine, the service endpoint must be given explicitly
- For LAL use: pdisk.lal.stratuslab.eu

Create Persistent Disk (CLI)

Provide size for disk and other options to create:

- `stratus-create-volume --size=SIZE --tag=TAG`

```
$ stratus-create-volume --size=2 --tag=mydisk
DISK 9682962d-4082-47df-bfe7-4e41a2fd0463
```

- All volumes have a unique identifier (UUID) associated with them
- UUID is used to control the given volume

Get information about volume(s)

- `stratus-describe-volumes [UUID]`

```
$ stratus-describe-volumes 9682962d-4082-47df-bfe7-4e41a2fd0463
:: DISK 9682962d-4082-47df-bfe7-4e41a2fd0463
    count: 0
    owner: cal
    tag: mydisk
    size: 2
```

- Command works just like `stratus-describe-instance` does

Disk Access

Restrictions

- Volume can only be mounted on one machine at a time
- Volume cannot be deleted when in use

Primitive Access Control:

- By default, created disks are "private" (`--private` option), with only the owner able to read, write and delete the volume.
- Disks marked as "public" (use `--public` option) can be read and written by anyone; only owner can delete it
- More elaborate (and useful) access control will appear when general groups and roles are implemented for all services

Create Persistent Disk (Web)

Log into interface with your username/password.

Cancel requests for a certificate!

Create new volumes

List of available volumes

https://pdisk.lal.stratuslab.eu:8445/pswd/disks/

Disk Detail (Web)

Mount info.

Volume info.

Control volume

Disk Information

Home | Disks

Disk Information

View mounts for this disk.

UUID	9682962d-4082-47df-bfe7-4e41a2fd0463
Size	2
Tag	mydisk
User's count	0
Owner	cal
Visibility	PRIVATE
Is original (seed)	☐
Disk type	DATA_IMAGE_RAW_READ_WRITE

Delete   Edit

Logged in as cal (logout)

Delete Persistent Disk

Note

- ***Volume cannot be deleted when in use!***

Web interface:

- Click the delete button for the disk
- ***Caution: there is no "Confirm?" dialog!***

CLI:

- Use: `stratus-delete-volume` ***UUID***

```
$ stratus-delete-volume bf1169ac-164e-4af3-b6eb-54d12b7ddb99
DELETED bf1169ac-164e-4af3-b6eb-54d12b7ddb99
```

Questions and Discussion

Exercises: Persistent Storage

Persistent Disk Lifecycle

- Run through entire lifecycle without using a VM
- Do this both via the command line interface and via the browser

http://www.stratuslab.eu