



# Advanced Storage - Stratis



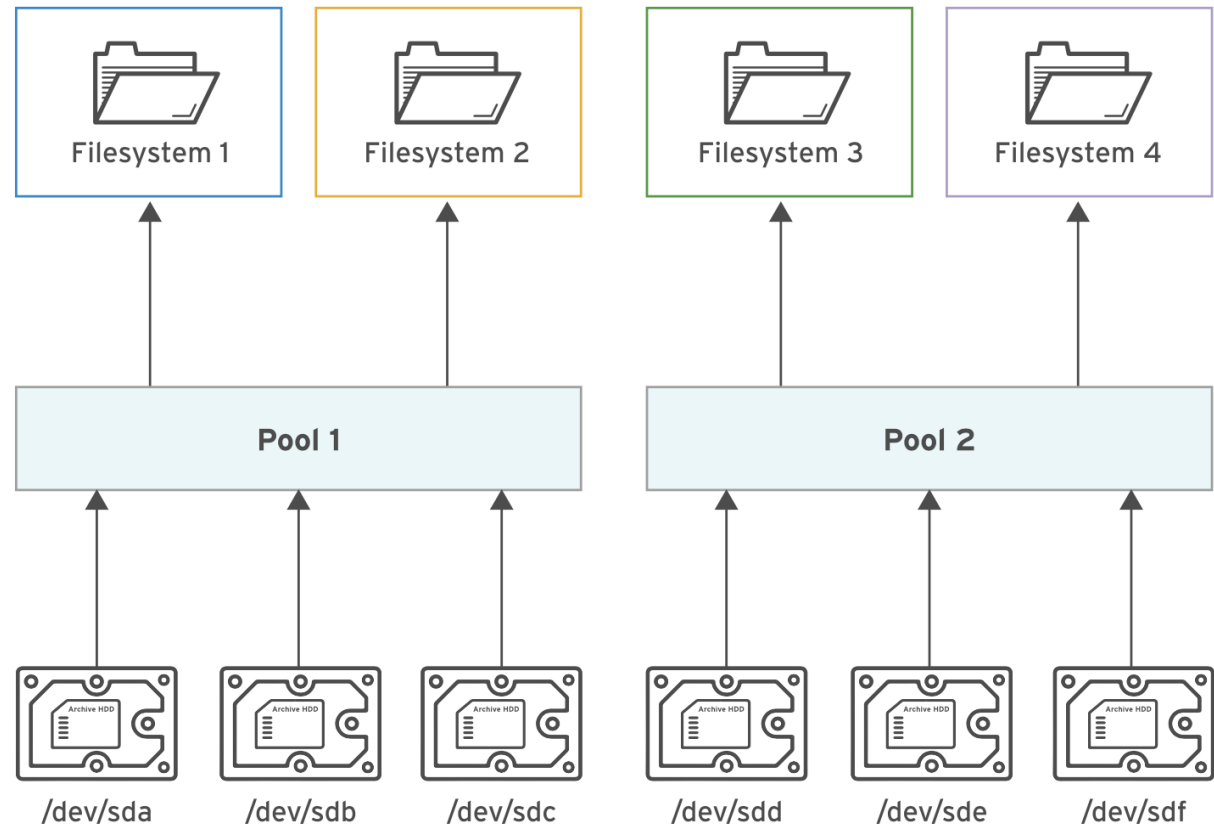
# Unit objectives

After completing this unit, you should be able to:

- Understand Architecture of Stratis
- Working with Stratis Storage
- Working with Stratis File Systems
- Working with Stratis Snapshots

# Understand Architecture of Stratis

- New local storage-management in v8
- Easier initial configuration
- As at writing, is available as Technology Preview
- Stratis runs as a service
- Filesystem formatted with XFS



# The Beauty

## Enhancements

- File System Snapshots
- Thin Provisioning
- Tiering – add-cache subcommand
- Programming APIs

## Supported Device

- HDDs and SSDs
- NVMe devices
- LVM LV
- MD RAID
- DM Multipath
- iSCSI

# Working with Stratis Storage

- Install necessary package

```
# dnf -y install stratis-cli stratisd
```

- Stratis daemon
  - handles reconfiguration requests
  - manages and monitor block devices, pools, file systems
  - Must be enabled

```
# systemctl enable --now stratisd
```

- File system managed by Stratis should be configured with Stratis Tools and commands only

# Manage Stratis Pool

- Assemble block storage into stratis pool

```
# stratis pool create pool1 /dev/vdb
```

- List all pools

```
# stratis pool list
```

Name	Total	Physical
pool1	20 GiB	37.64 MiB / 19.96 GiB



## Warning

If pool runs out, further writes is quietly lost

- Add more block storage into the pool

```
# stratis pool add-data pool1 /dev/vdc
```

- List all block storage in the pool

```
# stratis blockdev list pool1
```

# Managing Stratis File Systems

- Create Stratis file system

```
# stratis filesystem create pool1 fs1-app  
# stratis filesystem create pool1 fs2-app  
# stratis filesystem create pool1 fs3-data
```

- Remove Stratis file system

```
# stratis filesystem destroy pool1 fs2-app
```

- List Stratis file system

```
# stratis filesystem list [pool1]  
# stratis fs  
# blkid  
# lsblk --fs --list | grep stratis
```

# Mount the file system

- Temporarily

```
# ls /stratis/pool1
```

```
# mkdir /app /data
```

```
# mount /stratis/pool1/fs1-app /app
```

```
# mount /stratis/pool1/fs2-data /data
```

- Permanently

- Add UUID of each stratis fs into /etc/vfstab

```
# blkid | grep stratis | tail -2 | awk '{print $2}' >> /etc/fstab
```

- Modify /etc/fstab accordingly



# Modified /etc/fstab

- x-systemd.requires=stratisd.service option
- Only mount after stratisd.service is started

```
UUID="2795b12a-2d1b-49b9-a546-221bd620bad0" /app xfs  
defaults,x-systemd.requires=stratisd.service 0 0
```

```
/stratis/pool1/fs2-data /data xfs defaults,x-  
systemd.requires=stratisd.service 0 0
```

- Restart stratisd daemon and mount

```
# systemctl daemon-reload
```

```
# mount -a
```

# Verify mounted Stratis File Systems

```
# df -h
```

```
/dev/mapper/stratis-1-903319036ba84af7b6add7a2c0aa3440-thin-fs-  
2795b12a2d1b49b9a546221bd620bad0 1.0T 7.2G 1017G 1% /app  
/dev/mapper/stratis-1-903319036ba84af7b6add7a2c0aa3440-thin-fs-  
f05cc33f321840a5b749b0cbc3672aeb 1.0T 7.2G 1017G 1% /data
```

- There are THIN-provisioned!
  - df command report 1TB, regardless actual size configured
- Keep monitor pool free space.

# Working with Stratis Snapshots

- For backup purpose
- Use Cloning purpose
- Thin-provisioned
- Create snapshot from fs1-app

```
# stratis fs snapshot pool1 fs1-app 20200101
```

- Verify snapshot creation

```
# stratis fs list pool1
```

```
# ls /stratis/pool1/
```

- Keep monitor pool free space.

# Restore Snapshots

- Restore individual file

```
# mkdir /app/snapshots  
# mount /stratis/pool1/20200101 /app/snapshots  
# cp /app/snapshots/<deleted file> /app
```

- Restore entire file system

```
# stratis fs destroy fs1-app  
# stratis fs snapshot pool1 20200101 fs1-app
```

- Verify restoration

```
# stratis fs list pool1  
# ls /stratis/pool1/  
# mount /stratis/pool1/fs1-app /app
```

# Unconfigured Stratis

1. vi /etc/fstab
2. Unmount all stratis file systems
3. Remove all file systems (incl. snapshots)
4. Remove all pools
5. Stop stratisd
6. Remove stratis packages

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```
# umount -a
```

```
# stratis fs destroy pool1 <filesystem name>
```

```
# stratis pool destroy pool1
```

```
# systemctl stop stratisd
```

```
# dnf -y remove stratis-cli stratisd
```

# Quiz

1. What are so good about stratis? [Choose all that applies]
  - a) It has the capability to thin-provisioning, snapshots
  - b) It provides programming API to configure storage
  - c) It allows the file system to be mounted using different file system type
  - d) It supported long list of block device including local disks
2. If stratisd is not running, what should you do?
  - a) Reboot the system
  - b) Destroy pool and recreate pool
  - c) Restart the service
  - d) Restore File System from snapshot
3. When pool runs out of storage, what happens to stratis file system?
  - a) Some file system in the pool may not be accessible
  - b) All file systems in the pool are not accessible
  - c) System will crash and boot into emergency mode
  - d) Nothing happens
4. True or False: Stratis does support NVMe, SSD and iSCSI block devices

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# Unit summary

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