



# something about ext4 snapshot



杨勇强

百度

# History

next3 published

ext4 new  
features support

autodefrag

2010.5

2010.11

2011.4

2011.5

2011.8

2012.8

next3 ported to ext4

ext4 snapshot  
published

writable snapshot

# Developers

Amir Goldstein (author)      Aditya Dani

Shardul Mangade      Piyush Nimalkar

Harshad Shirwadkar      Yongqiang Yang

# Features

- Compatible with ext4
- Incremental, volume level snapshots
- Snapshots use file system space
- Snapshot deletion frees up space
- Retains ext4 stability including journaling and fsck
- Minimal performance overhead
- No upper limit on number of snapshots
- Easy management

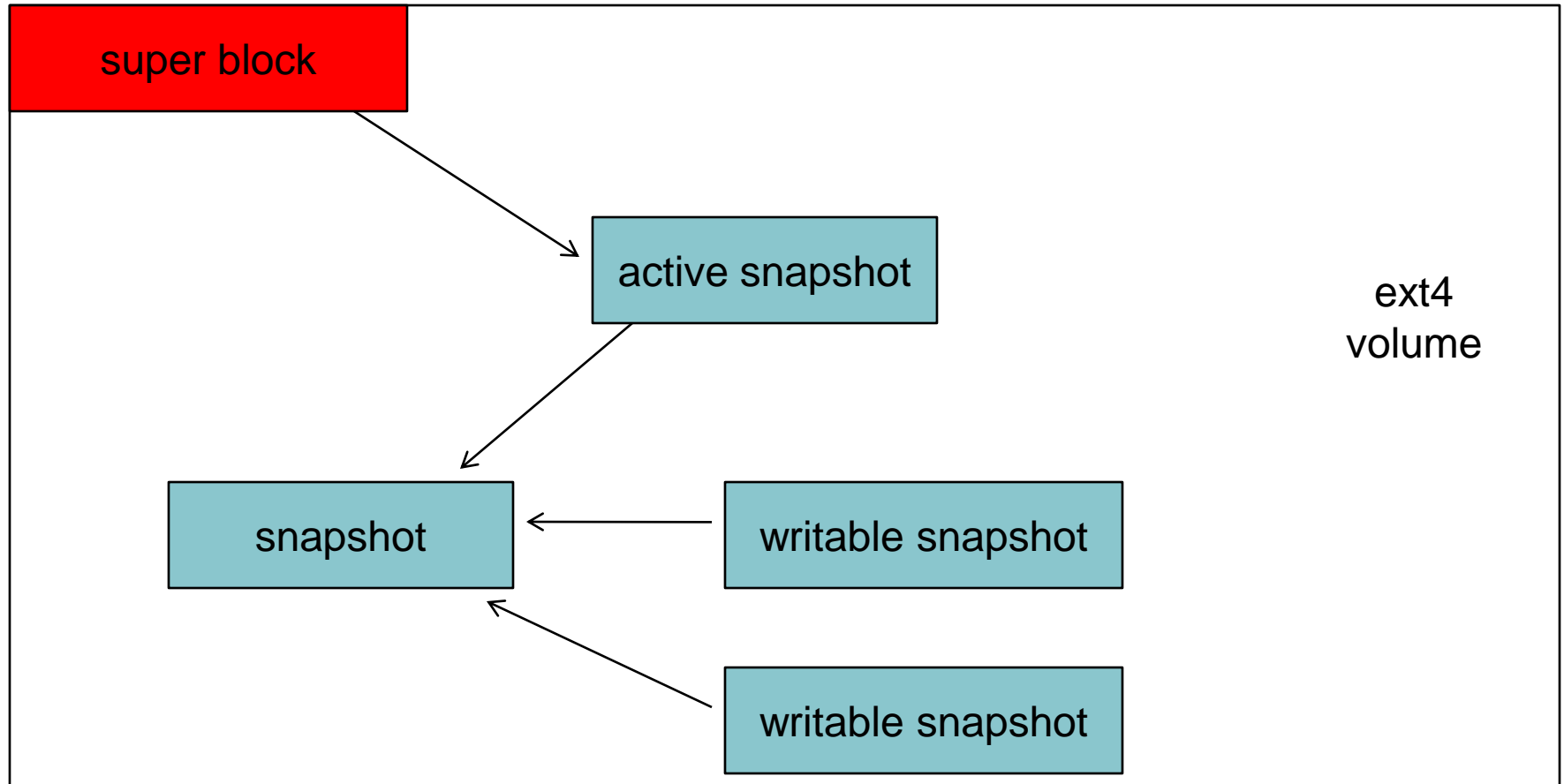
# Limitations

- block size = page size
- journal = order
- snapshot size  $\leq$  16TB

# Usage

- create a snapshot
  - e4snap take <snapname>
- mount a snapshot
  - e4snap mount snapname
- delete a snapshot
  - e4snap delete snapname

# Snapshot management



# Principle

- Meta
  - Copy On Write
- Data
  - Move On Write



# ext4-meta

1. get\_write\_access

2. modify meta

3. dirty\_meta

# ext4 snapshot meta

1. get\_write\_access

2. modify meta

3. dirty\_meta

copy\_meta\_to\_snapshot

## ext4 - data

1. get\_block

2. write\_data

# ext4 snapshot - data

1. get\_block

2. write\_data

1. alloc\_new\_block

2. move\_data\_to\_snapshot

# Compare with others

	stability	easy management	auto defrag	preallocate space
btrfs	×	✓	✓	✓
ext4	✓	✓	✓	✓
LVM thin	✓	×	×	✓

# Future

- Bug fix
- Writable snapshot
- File or directory level snapshot

# References

- NEXT3 Filesystem Home Page  
<http://next3.sourceforge.net/>
- Writable snapshot  
<https://github.com/YANGYongqiang/ext4-snapshots/wiki/ext4-writable-snapshot>
- <http://global.phoronix-test-suite.com/index.php?k=profile&u=amir73il-4632-11284-26560>

Thanks

Q & A