LEVERAGING BTRFS, LINUX AND OPEN SOURCE

Suman Chakravartula

rockstor.com / @rockstorinc

SDC 2015
PROJECT BRIEF
PROJECT PRINCIPLES

- Open Source
- Community focused
- Hardware agnostic
- Linux/BTRFS based
- Simple to install and manage
- Use boring technology whenever possible
- Contributor friendly
OVERVIEW

- Developing with BTRFS
- Server side API's with Django and DRF
- ZMQ for data replication
- Django and ZMQ for asynchronous APIs
- Backbone.js
- Gevents, SocketIO and websockets
- Docker
BTRFS

Volume Management features

- mix and match drives
- add and remove drives
- change raid profiles
BTRFS

Copy on Write features

- Subvolumes
- Snapshots
- Clones
- Send/Receive Snapshots
BTRFS

Other cool features

- Quota groups
- Compression
- Deduplication
- SSD awareness
DEVELOPING WITH BTRFS

- btrfs-progs user space utilities
- Cutting edge
- Not developer friendly yet.
OTHER OS LEVEL TOOLS

- NetworkManager
- smartmontools
- udevadm
- SystemTap
- inotify
- and more...
APPLICATION ARCHITECTURE
DJANGO AND FRIENDS

- Django MVC
- Postgresql
- Django Rest Framework
STATE SYNCHRONIZATION

- System state is the fact
- Application state is the truth
- Minimal application state
- Eventual consistency
BACKBONE AND FRIENDS

- Backbone MVC
- JQuery
- D3
• Job scheduling
• Asynchronous replication of Shares
• SystemTap probes (On hold)
DJANGO + ZMQ = ASYNCHRONOUS

- Long running tasks: btrfs balance, scrub etc..
- Task manager uses the RESTful API
DJANGO + ZMQ
DOCKER + ZMQ

- Hosting Docker based applications
- ZMQ for app installs and updates.
ROCK-ON PLAY STORE
SYSTEMTAP AND ANALYTICS

- ZMQ for scheduling stap scripts
- Probe management from the UI
- Reports using D3
ASYNCHRONOUS REPLICA

- BTRFS send/receive
- LAN or WAN
- Replicate to multiple destinations (planned)
- Encryption (planned)
PUB-SUB FOR DATA TRANSFER
PUSH-PULL FOR META DATA
RESPONSIVE UI AND EVENT DRIVEN BACKEND

- Subscribe, not poll
- Event driven message passing
- Push notifications
GEVENT-SOCKETIO + WEBSOCKETS
SUMMARY

- developing with BTRFS
- server side API's with Django and DRF
- ZMQ for data replication
- Django and ZMQ for asynchronous APIs
- Backbone.js
- Gevent, SocketIO and websockets
- Docker
OPEN SOURCE SOFTWARE AND COMMUNITY FEEDBACK LOOP

- Community focused development
- Vision versus community wants
QUESTIONS OR COMMENTS?

Important links

- Website: rockstor.com
- Community: forum.rockstor.com
- Code: github.com/rockstor/rockstor-core
- Docs: rockstor.com/docs