OSTree

Atomic Upgrades and the Development Community

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OSTree

- "git for operating system binaries" [1]
- **file checkouts** via **hardlinks**

```
[rob@localhost demo]$ ls -li dir1/foo.txt
928716 -rw-rw-r--. 1 rob rob 4 Oct 21 20:56 dir1/foo.txt
[rob@localhost demo]$ ln dir1/foo.txt dir2/bar.txt
[rob@localhost demo]$ ls -li dir1/foo.txt dir2/bar.txt
928716 -rw-rw-r--. 2 rob rob 4 Oct 21 20:56 dir1/foo.txt
928716 -rw-rw-r--. 2 rob rob 4 Oct 21 20:56 dir2/bar.txt
```

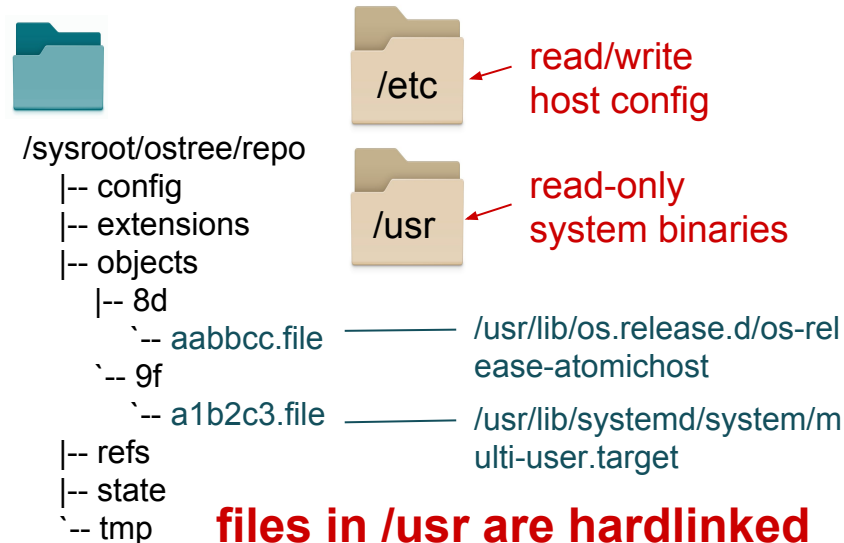**inode number**   **reference count**

[1] https://ostree.readthedocs.io/en/latest/manual/introduction/

Filesystem

Usual layout

/etc /home /run

/usr /var ...

OSTree-based deployment


```
/sysroot/ostree/repo
|-- config
|-- extensions
|-- objects
    |-- 8d
        `-- aabbcc.file
    `-- 9f
        `-- a1b2c3.file
|-- refs
|-- state
`-- tmp
```

/etc ← read/write host config

/usr ← read-only system binaries

aabbcc.file ──── /usr/lib/os.release.d/os-release-atomichost

a1b2c3.file ──── /usr/lib/systemd/system/multi-user.target

files in /usr are hardlinked to files in the ostree repo

OSTree Commands Demo

https://asciinema.org/a/208112

Why is this useful?

- Atomic upgrades and rollback
- "Image-like" replication; easily verify bits are the same
- Handles *recording* of files and their *movement*; no concept of how a filesystem should be laid out
- **libostree** - base for hybrid technologies such as **rpm-ostree**

```
…
ostree_commit_get_parent (1);
ostree_commit_get_content_checksum (1);
ostree_check_version (1);
ostree_deployment_get_osname (1);
ostree_deployment_new (6);
ostree_repo_new (1);
   … [2]
```

[2] library functions in https://github.com/ostreedev/ostree/tree/master/src/libostree

rpm-ostree - Atomic Upgrade and Rollback Demo

https://asciinema.org/a/Am6WZ3Ive6pAZuFz3TT2c2Sy6

Development Community / Related Projects

- OSTree: https://ostree.readthedocs.io/
- rpm-ostree: https://rpm-ostree.readthedocs.io/
- Fedora CoreOS: https://coreos.fedoraproject.org/
- CoreOS Assembler: https://github.com/coreos/coreos-assembler
- Project Atomic: https://www.projectatomic.io/
- Team Silverblue: https://silverblue.fedoraproject.org/
- Endless OS: https://endlessos.com/
- Flatpak: https://flatpak.org/
- Internet of Things (IoT) / OTA updates:
  https://docs.atsgarage.com/concepts/yocto-ostree-and-treehub.html
- Embedded updates: https://github.com/advancedtelematic/meta-updater
- Skopeo: https://github.com/containers/skopeo
- More!: https://ostree.readthedocs.io/en/latest/#projects-using-ostree

Learning More / Getting Involved

Tutorials

- Atomic Host Lab: https://dustymabe.com/2017/08/29/atomic-host-101-lab-part-0-preparation/
- OSTree "Hello World":
  https://ostree.readthedocs.io/en/latest/manual/introduction/#hello-world-example
- Contributing Guide: https://ostree.readthedocs.io/en/latest/CONTRIBUTING/

Community

- Fedora CoreOS issue tracker: https://github.com/coreos/fedora-coreos-tracker
- Weekly Community IRC meetings: https://github.com/coreos/fedora-coreos-tracker#meetings

Tools

- Fedora Atomic Host: https://getfedora.org/atomic/prerelease/
- Vagrant: https://www.vagrantup.com/

Thanks Seneca for hosting!

- Any questions/discussion welcomed:

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- rfairley on IRC freenode
- GitHub: https://github.com/rfairley
- Twitter: https://twitter.com/robtfair