What's new and what's next in Fedora CoreOS

Fedora 37 Release Party 🎉

Clément Verna
Engineering Manager at Red Hat

Joseph Marrero Corchado
CoreOS engineer at Red Hat

Timothée Ravier
CoreOS engineer at Red Hat

fedora

Agenda

- What is Fedora CoreOS?

- What's new since last year?

- What's coming soon?

What is Fedora CoreOS?

An official Fedora edition

- We're now an official Fedora edition! 🎉

- Focused on **single node** and **clusters** use cases

- Successor to two **container-first** OSes:
  - CoreOS Inc's Container Linux
  - Fedora Atomic Host (from Project Atomic)

- **Incorporates ideas** from both:
  - Provisioning stack & cloud native expertise (CL)
  - Fedora foundation, update stack & SELinux (FAH)

Philosophy behind Fedora CoreOS

- **Automatic updates** by default
  - No interaction for administrators

- **Automated provisioning**
  - All nodes start from **same starting point**
  - Use Ignition to provision a node on **first boot**

- **Immutable infrastructure**
  - **Automate** deployment and system configuration
  - Update configs and **re-provision** to apply changes

None of this happens without… Passing Tests!

✓	☼	kola-aws	13 hr - **#325**	4 days 0 hr - **#312**	1 hr 11 min
✓	☼	kola-azure	13 hr - **#80**	12 days - **#57**	45 min
✓	☼	kola-gcp	13 hr - **#169**	3 days 14 hr - **#164**	15 min
⋯	☼	kola-kubernetes	N/A	N/A	N/A
✓	☁	kola-openstack	13 hr - **#340**	1 day 10 hr - **#337**	45 min

- Every single build is **extensively tested in CI** before it's released
- Required to make automatic updates **safe**

Multiple Update Streams

Fedora CoreOS is available across 3 different release streams:

Stable
v 35.20220424.3.0
JSON — 2 days ago

The Stable stream is the most reliable version of Fedora CoreOS. Releases are battle-tested within the Testing stream before being promoted.

Show Downloads

Testing
v 36.20220505.2.0
JSON — 2 days ago

The Testing stream contains the next Stable release. Mix a few Testing machines into your cluster to catch any bugs specific to your hardware or configuration.

Show Downloads

Next
v 36.20220507.1.0
JSON — 2 days ago

The Next stream represents the future. It provides early access to new features and to the next major version of Fedora. Run a few Next machines in your cluster, or in staging, to help find problems.

Show Downloads

Supported platforms

- Available for a plethora of **cloud/virt platforms**:
  - Alibaba, AWS, Azure, Azure Stack, DigitalOcean, Exoscale, GCP, IBM Cloud, OpenStack, Nutanix, Vultr, VirtualBox, VMware, QEMU/KVM
  - Directly launchable on AWS & GCP

- Several options for **Bare Metal**
  - Live ISO (automated or interactive installations)
  - PXE (network) boot
  - Raw and 4K native disk images

Supported architectures

- Multiple Architectures:
  - **x86_64**
  - **aarch64**
  - **s390x**
  - **ppc64le** support coming soon

What's new in Fedora CoreOS?

(since August 2021)

FCOS as a top level Fedora Edition

- Closer **proximity** to Fedora Releases

- Working closer with **Fedora QA**

- Participating more in the **Fedora Change Process**

- Continuing to deliver Fedora CoreOS **consistently**

Added Platforms

- Added **aarch64** - including AWS images

- Added **s390x** - including s390x IBMCloud images

- Added support for Nutanix

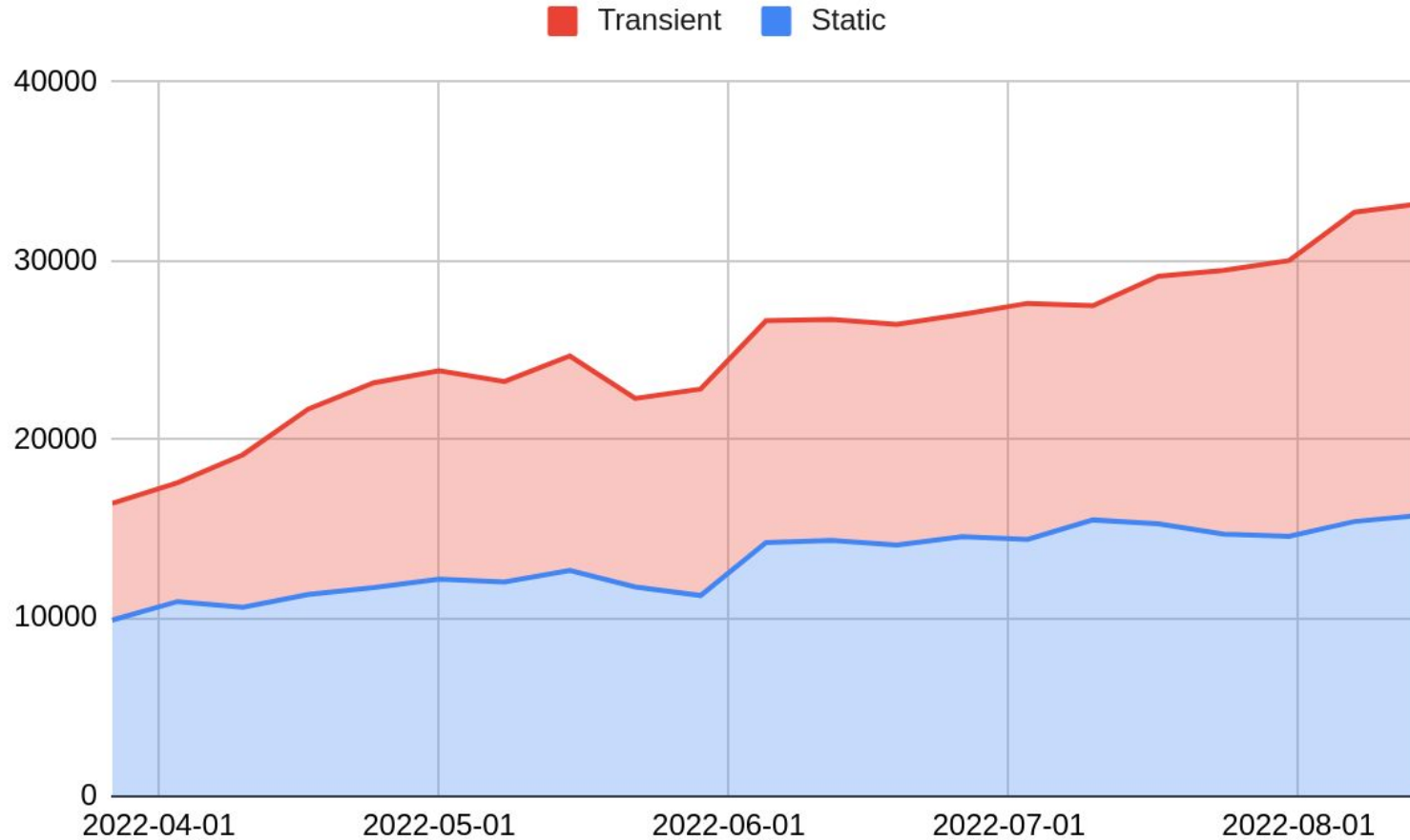- Became the base for `podman machine`

DNF Count Me support

- Enables **privacy preserving** and reliable system counting

- Only reports a **large approximation** of the age of a system

- Only reaches out to **official** Fedora repositories servers
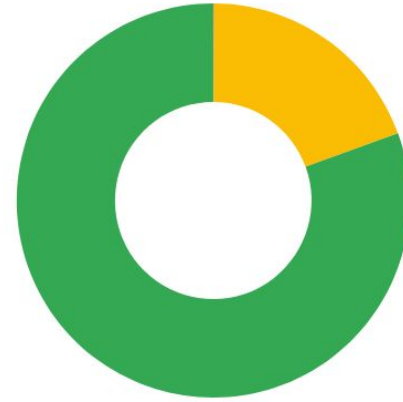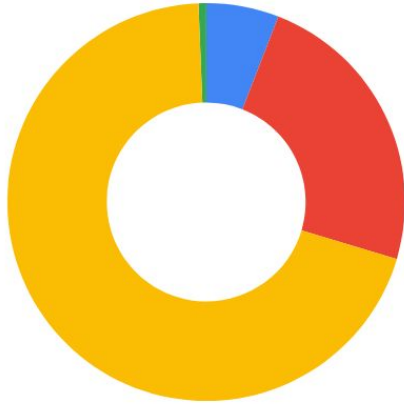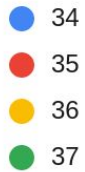
- **No other information** sent or stored

https://fedoramagazine.org/getting-better-at-counting-rpm-ostree-based-systems/
https://github.com/coreos/fedora-coreos-tracker/issues/717

CountMe Stats - All Nodes

CountMe Stats - Fedora Release & Architecture

Fedora Release	Number of FCOS Instances
34	982
35	3950
36	11612
37	105

Architecture	Number of FCOS Instances
ppc64le	2
s390x	8
aarch64	3229
x86_64	13411

iptables now using nftables by default

- iptables was using **legacy** backend instead of **nftables** one

- **Unintended** consequence of [alternatives(8)](#) 's behaviour

  - Configuration stored in a mix of **/var** and **/etc**

  - **Incompatibility** with **rpm-ostree** strict split between configuration and data

- Full fix requires **adjustments** to [alternatives(8)](#) or an alternative(!)

https://docs.fedoraproject.org/en-US/fedora-coreos/alternatives/
https://github.com/coreos/fedora-coreos-tracker/issues/676
https://github.com/coreos/fedora-coreos-tracker/issues/677

Building and Testing against Rawhide

- We are now building and testing a **rawhide** stream
  - Suite of **automated tests** now complement rawhide!
  - Helps identify **unexpected breakage** from new features
  - Now participate **closer upstream** with developers and get general problems fixed

And.. a lot of other stuff!

- Investments in
  - Automated Testing
  - Automated builds

What's coming soon in Fedora CoreOS?

More enablement - More Platforms

- **Azure ARM** instances

- **GCP ARM** instances

- Azure Community Galleries

- Power PC (**ppc64le**) architecture support

- Adding support for **Kubevirt**

- Secure Execution support for **S390x**

CoreOS Layering / OSTree Native Containers

- Fedora CoreOS OSTree is additionally offered **as a container**

- Customize Fedora CoreOS by performing a **container build**
  - `FROM quay.io/fedora/fedora-coreos:stable`

- Makes individual **derivation** and **distribution** easier
  - Dockerfile/Containerfile & Container registry

- Updates managed by administrator rebuilding the image and rpm-ostree upgrade.

CoreOS Layering / OSTree Native Containers

Current Changes:
- https://fedoraproject.org/wiki/Changes/OstreeNativeContainer

Proposed Changes:
- https://fedoraproject.org/wiki/Changes/OstreeNativeContainerStable

CoreOS Layering Example

```
# This is like https://tailscale.com/download/linux/fedora
# except it happens as part of a container build!  You then need to do
# `tailscale up` via some other mechanism.
FROM quay.io/fedora/fedora-coreos:stable
RUN cd /etc/yum.repos.d/ && curl -LO https://pkgs.tailscale.com/stable/fedora/tailscale.repo && \
    rpm-ostree install tailscale && rpm-ostree cleanup -m && \
    systemctl enable tailscaled && \
    ostree container commit
```

- https://github.com/coreos/coreos-layering-examples

CoreOS Layering Example

- Build machine:

```
$ podman build -t myfcos:latest .
$ podman push myfcos:latest quay.io/$USER/myfcos:latest
```

- Host system:

```
$ rpm-ostree rebase --experimental \
    ostree-unverified-registry:quay.io/$USER/myfcos:latest
```

Questions

Get involved!

- Web: https://getfedora.org/coreos

- Issues: https://github.com/coreos/fedora-coreos-tracker/issues

- Forum: https://discussion.fedoraproject.org/tag/coreos

- Mailing list: coreos@lists.fedoraproject.org

- IRC: #fedora-coreos on Libera.Chat

- Matrix: #coreos:fedoraproject.org

travier@redhat.com

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