

## **Upstreaming Fedora CoreOS**

### **Flock 2023**



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- What is Fedora CoreOS?
- How Fedora CoreOS is made and tested right now
- Where we want to go
- How we're going to do it



## 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:
   o 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

## 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.



#### **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.



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

Show Downloads

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

- Fedora primary architectures:
  - **x86\_64**
  - aarch64
- Fedora alternative architectures
  - o **s390x**
  - ppc64le



### CountMe Stats - All Nodes



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### CountMe Stats - Release & Architecture



All Nodes	S	
ppc64le		
<b>s</b> 390x		
😑 aarch64		
<b>x86_64</b>		

Fedora Release	Number of FCOS Instances
34	1353
35	6666
36	4549
37	4904
38	26422

Architecture	Number of FCOS Instances	
ppc64le	17	
s390x	19	
aarch64	10634	
x86_64	33224	



## Fedora CoreOS release engineering

## How package updates land in Fedora CoreOS (Rawhide)?



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## It starts with a commit in dist-git

Overview	Commits 561	C Branch: rawhide
@ Files	Forbid custom EC more completely         So Dmitry Belyavskiy • 7 hours ago         □ Tawhide         □ Tawhide      <	2 <b>2b0eda8</b>
Commits	Rebuilt for https://fedoraproject.org/wiki/Fedora_39_Mass_Rebuild	2 7e9699e
🔉 Branches	🖳 Fedora Release Engineering • 7 days ago	
₽ Forks	Add TMT interoperability tests & rewrite python STI test to TMT	7 979cb8a 🕢
Neleases	Peter Leitmann • 2 months ago	
fonitoring status:	- Upload new upstream sources without manually hobbling them.	6 <b>477bb5e</b> ග්
Ø Disabled	a Sanana Prasad • 4 months ago	
ugzilla Assignee:	Rebase ELN/RHEL patch for OpenSSL 3.0.8	1 3 e198b69 💩
edora: belyavs	Stephen Gallagher • 5 months ago	
PEL:	ELN: fix SHA1 signature patch again	1 1 3 16700dd D

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### Which becomes a koji build

Information for task build (rawhide, /rpms/openssl.git:2b0eda88de8c3f7b84c603882aad160c019ae3a4)

ID	104005760
Method	build
Parameters	Build target: rawhide Src: git+https://src.fedoraproject.org/rpms/openssl.git#2b0eda88de8c3f7b84c603882aad160c019ae3a4
State	closed
Build	openssl-3.0.8-4.fc39
Created	Thu, 27 Jul 2023 10:54:41 UTC
Started	Thu, 27 Jul 2023 10:54:47 UTC
Completed	Thu, 27 Jul 2023 11:37:02 UTC
Total time	0:42:21
Task time	0:42:15
Owner	dbelyavs
Channel	default
Host	bulldvm-x86-28.lad2.fedoraproject.org
Arch	noarch
Parent	
Descendants	✓ build
	— 🛹 buildSRPMFromSCM (/rpms/openssl.git:2b0eda88de8c3f7b84c603882aad160c019ae3a4)
	— ✔ buildArch (openssl-3.0.8-4.fc39.src.rpm, i686)
	— ✔ buildArch (openssl-3.0.8-4.fc39.src.rpm, x86_64)
	— ✔ buildArch (openssl-3.0.8-4.fc39.src.rpm, aarch64)
	— 🛹 buildArch (openssl-3.0.8-4.fc39.src.rpm, ppc64le)
	— ✔ buildArch (openssl-3.0.8-4.fc39.src.rpm, s390x)
	🖵 🛹 tagBuild (noarch)

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## How does that get into Fedora CoreOS?

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- At this point the package update is available in Rawhide
- or lands in a stable repo in a Fedora release
- But has never been run or tested against Fedora CoreOS

## What happens in Fedora CoreOS CI?

Fedora CoreOS is build from a version fixed list of packages
 We call them lockfiles: Locking package versions
 List stored in the Fedora CoreOS config repo

- An hourly job pickups new package versions
- Runs our full test suite to validate this new combinaison

### Bump the lockfiles



lockfiles: bump to latest	lockfiles: bump to latest				
Job URL: https://jenkins-tedor	ra-coreos	-pipeline.apps.ocp.fedoraproject.org/job/bump-locktile/6/4/			
Job definition: https://github	b.com/cor	eos/fedora-coreos-pipeline/blob/main/jobs/bump-lockfile.Jenkinsfile	le		
우 testing-devel					
ereosbot committed 16 hours	ago			1 parent d0c7956 commit 0c702cf	
Showing 4 changed files with 28 additions and 28 deletions.				Split Unified	
Q Filter changed files		∨ ‡ 14 ■■■■ manifest-lock.aarch64.json []		•••	
C manifest-lock.aarch64.ison	•	00 -1024,10 +1024,10 00			
		1024 "evra": "1.8.0-6.fc38.aarch64"	1024 "evra": "1.8.0-6.fc38.aarch64"		
📋 manifest-lock.ppc64ie.json	•	1025 },	1025 },		
🗋 manifest-lock.s390x.json	•	1026 "podman": {	1026 "podman": { 1027		
manifest-lock x86 64 ison	•	1027 - "evia: 5.4.5.1-1.1056.aarti104	1028 }.		
		1029 "podman-plugins": {	1029 "podman-plugins": {		
		1030 - "evra": "5:4.5.1-1.fc38.aarch64"	1030 + "evra": "5:4.6.0-1.fc38.aarch64"		
		1031 },	1031 },		
		1032 "policycoreutils": {	1032 "policycoreutils": {		
		1033 "evra": "3.5-1.fc38.aarch64"	1033 "evra": "3.5-1.fc38.aarch64"		
		+ 00 -1105,10 +1105,10 00			
		1105 "evra": "4.8-12.fc38.aarch64"	1105 "evra": "4.8-12.fc38.aarch64"		
		1106 },	1106 },		
		1107 "selinux-policy": {	1107 "selinux-policy": {		
		1108 - "evra": "38.21-1.fc38.noarch"	1108 + "evra": "38.22-1.fc38.noarch"		
		1109 },	1109 },		
		1110 "selinux-policy-targeted": {	1110 "selinux-policy-targeted": {		
		1111 - "evra": "38.21-1.fc38.noarch"	1111 + "evra": "38.22-1.TC38.noarch"		
		1112 }, 1113 "setup": {	1112 }, 1113 "setup": {		
		1114 "evra": "2.14.3-2.fc38.noarch"	1114 "evra": "2.14.3-2.fc38.noarch"		
		→ A9 -1277 16 +1277 16 A0			

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## Scheduled test job

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# How package updates land in Fedora CoreOS (Rawhide)?





### If failure, a human has to look at it and investigate

#### rawhide: kola basic tests are failing on x86 64 with systemd-254~rc2-1.fc39 update #1527



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Open aaradhak opened this issue 2 weeks ago · 13 comments · May be fixed by coreos/fedora-coreos-config#2515

aaradhak commented 2 weeks ago • edited + Member ... Assignees No one-assign yourself Describe the bug The kola basic tests are failing on the latest rawhide x86 64 builds since build 39.20230716.91.0 Labels kind/bug basic Projects [2023-07-17T12:49:24.039Z] --- FAIL: basic (8.35s) harness.go:1741: mach.Start() failed: machine c78e2b87-ddfa-4237-b769-7d16dd [2023-07-17T12:49:24.040Z] None yet fcos.upgrade.basic Milestone No milestone [2023-07-17T12:57:57.919Z] --- FAIL: fcos.upgrade.basic/upgrade-from-current (120.97s) [2023-07-17T12:57:57.919Z] basic.go:318: failed waiting for machine reboot: timed out after 2m0s wa Development Successfully merging a pull request may close this Observed on checking the console logs that these tests began failing after the systemd version upgrade from systemd issue 253.5-6.fc39 -> systemd 254~rc2-1.fc39 1 initramfs: Remove manual sysroot mounting cgwalters/fedora-coreos-config console.log output related to systemd: Notifications Customize [ 5.165851] systemd[1]: Failed to start ignition-ostree-check-rootfs-size.service - Ignition OSTree: Check F [[0;32m OK [0m] Stopped [0;1;39mdracut-cmdline.service[0m - dracut cmdline hook △ Subscribe 5.167786] systemd[1]: Dependency failed for ignition-complete.target - Ignition Complete. You're not receiving notifications from this thread. [[0;32m OK [Om] Stopped [0;1;39mdracut-cmdline-ask.service[Om... for additional cmdline parameters. [ 5.170887] systemd[1]: Dependency failed for initrd.target - Initrd Default Target. [ 5.171559] systemd[1]: initrd.target: Job initrd.target/start failed with result 'dependency'. 6 participants [[0;32m OK [Om] Started [0;1;39memergency.service[Om - Emergency Shell. [[0;32m OK [Om] Reached target [0;1;39memergency.target[Om - Emergency Mode. leg 😩 🔘 😤 🏝 🌒 Starting [0;1;39mignition-virtio-dump-jour...ce[0m - Dump Journal to Virtio Port... 5.179091] systemd[1]: initrd.target: Triggering OnFailure= dependencies. 5.180358] systemd-journald[259]: Received client request to sync journal. 5.180937] systemd[1]: ignition-complete.target: Job ignition-complete.target/start failed with result 'dep A Lock conversation 5.181807] systemd[1]: systemd-ask-password-console.path: Deactivated successfully. S Pin issue (i) → Transfer issue This is the kola basic output from one of the latest rawhide builds kola-basic-7146e04d.zip ាំ Delete issue



# If a bug is found it then becomes a bugzilla or upstream issue

mrc0mmand commented last week • edited 👻	Member ···· Assignees	
systemd version the issue has been seen with	poettering	
254-rc2	Labels	
Used distribution	pid1 regression 🛦	
Fedora Rawhide	Milestone	
Linux kernel version used	v254	
No response	Development	
CPU architectures issue was seen on	Successfully merging a pr issue.	ull request may close this
None	switch-root: use MS_	REC for /run, unless we a
Component	<b>; ; switch-root: Make su</b> DaanDeMever/system	<b>re all mounts under /run.</b> nd
No response		
Expected behaviour you didn't see	Notifications	Customiz
We've got a couple of reports [0][1] regarding missing mounts and after some playing around with Fedora-S x86_64-Rawhide-20230718 n.0 iso it looks like systemd forgets mounts mounted in initrd when transitioning	erver-dvd- to the "real"	ications from this thread.
system:	5 participants	

### If the impact is not too important we can snooze the

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#### - rawhide

- 28 pattern: ext.config.root-reprovision.\*
- 29 tracker: https://github.com/coreos/fedora-coreos-tracker/issues/1489
- 30 snooze: 2023-08-04
- 31 arches:

test

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32 - ppc64le

## If the impact is more important we can lock the package to a previous working version

#### packages: glib2: evr: 2.76.4-1.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1530 type: pin systemd: evr: 253.5-6.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1527 type: pin systemd-container: evr: 253.5-6.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1527 type: pin systemd-libs: evr: 253.5-6.fc39 metadata: reason: https://dithub.com/coreos/fedora-coreos-tracker/issues/1527 type: pin systemd-pam: evr: 253.5-6.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1527 type: pin systemd-resolved: evr: 253.5-6.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1527 type: pin systemd-udev: evr: 253.5-6.fc39 metadata: reason: https://github.com/coreos/fedora-coreos-tracker/issues/1527 type: pin

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## We can also fast track a bodhi update with the fix instead of waiting for the update to reach stable

pack	kages:
aa	ardvark-dns:
	evr: 1.6.0-1.fc38
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track
CO	ontainers-common:
	evra: 4:1-89.fc38.noarch
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track
CO	ontainers-common-extra:
	evra: 4:1-89.fc38.noarch
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track
ne	etavark:
	evr: 1.6.0-2.fc38
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track
po	odman:
	evr: 5:4.5.0-1.fc38
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track
po	odman-plugins:
	evr: 5:4.5.0-1.fc38
	metadata:
	bodhi: https://bodhi.fedoraproject.org/updates/FEDORA-2023-92b7759c3e
	reason: https://github.com/coreos/fedora-coreos-tracker/issues/1471
	type: fast-track



# Different streams (rawhide, devel, next, testing, stable)

- Rawhide: Same as Fedora Rawhide
- next-devel, testing-devel: Nightly builds
- next, testing, stable: User visible streams
- next:
  - Mostly used to test the upcoming major Fedora releases
  - Enabled at Beta time
- testing: Letting users test updates before they land in stable
   2 weeks later



# Proposal to upstream Fedora CoreOS testing

### When are feedback loop better?

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# How package updates land in Fedora CoreOS (Rawhide)?

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## Gating updates on Fedora CoreOS tests

- Currently we catch issue and bug late in the development process
- A lot of effort goes into investigating, reporting and helping fix the issues after the updates reached stable.



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# Integrating Fedora CoreOS CI results into ResultsDB

- Select a subset of Fedora CoreOS packages
- Trigger a Jenkins pipeline with a subset of our tests (when the koji build is successful)
- Report the results in the Fedora ResultsDB
- Show the results in Bodhi updates



## Tests results in ResultsDB linked to an update.

esulted frontend Be

030		~
Se	earch	
F	FEDORA-2023-51672f3bd5*	
	Tesicaso	
	PASSED FAILED INFO NEEDS_INSPECTION	
0	06/29/2023 - 07/28/2023	
(	Got	

Submitted (UTC)	Testcase	Outcome	ltem	Note	Details	Groups	Logs
2023-07-28 08:48:05.523337	update.advisory_boot	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:47:58.321668	update.server_remote_logging_server	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:47:53.037594	update.server_remote_logging_client	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:47:40.156722	update.base_update_cli	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:47:39.211206	update.base_selinux	FAILED	FEDORA- 2023-51672f3bd5	_advisory_post module failed	Details	In 3 groups →	Link →
2023-07-28 08:46:38.581129	update.base_reboot_unmount	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:46:30.174785	update.base_system_logging	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:46:05.850195	update.server_firewall_default	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:46:04.462551	update.base_services_start	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28 08:45:57.490716	update.base_selinux	PASSED	FEDORA- 2023-51672f3bd5		Details	In 3 groups →	Link →
2023-07-28	update.live_build	QUEUED	FEDORA-		Details	In 3 groups	Link





O NetworkManager-1.43.90-1.fc39	testing
Details Builds 1 Automated Tests @5 060 @1	
Automated Test Results	
NetworkManager-1.43.90-1.fc39	
• fedora-ci.koji-build.tier0.functional	a few seconds ago
📱 fedora-ci.koji-build.rpminspect.static-analysis	9 minutes ago
FEDORA-2023-51672f3bd5	
* O update.base_reboot_unmount x86_64 server	a minute ago
★ ⊘ update.base_system_logging x86.64 server	a minute ago
update.server_firewall_default     x86_64 server	2 minutes ago
★ ⊘ update.base_services_start x86_64 server	2 minutes ago
★ ⊘ update.base_selinux x86_64 server	2 minutes ago
* Z update.live_build x86_64 workstation-live-iso	9 minutes ago
* Z update.install_default_update_live x86_64 workstation-live-iso	9 minutes ago
* Z update.install_default_update_live x86_64 workstation-live-iso	9 minutes ago
* Z update.base_reboot_unmount x86_64 kde	9 minutes ago
★ Z update.base_selinux x86_64 kde	9 minutes ago
★ Z update.base_system_logging x86_64 kde	9 minutes ago
★ Z update.base_services_start x86_64 kde	9 minutes ago
* Z update.desktop_printing x86_64 vde	9 minutes ago



Providing Feedback on Package Updates that break CoreOS CI Tests

• Run Fedora CoreOS tests before packages are committed into Fedora repos

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- Let packagers come to us when their package update breaks Fedora CoreOS
- Avoids us having to go back to packagers after the fact, once the update has already landed
- Optional initially

## Ultimately Gating Packages that fail CoreOS CI Tests

- Enforce passing Fedora CoreOS tests before pushing updates
- Critical to make rpm-ostree variants a first class citizen in Fedora
- Will benefit all rpm-ostree based variants:
  - CoreOS, IoT, Silverblue, Kinoite, Sericea, Onyx



### Future considerations

- Building a common, minimal, shared Fedora "Core" minimal ostree image
- Minimal package set shared by all OSTree variants
- Used as input to other variants
- Start to use Image Builder for some build artifacts

## Questions?

## Get involved!

- Web: <u>https://fedoraproject.org/coreos/</u>
- Issues: <u>https://github.com/coreos/fedora-coreos-tracker/issues</u>
- Forum: <u>https://discussion.fedoraproject.org/tag/coreos</u>
- Mailing list: <u>coreos@lists.fedoraproject.org</u>
- IRC: <u>#fedora-coreos on Libera.Chat</u>
- Matrix: <u>#coreos:fedoraproject.org</u>



