

# The Hitchhiker's Guide to the RHEL ecosystem

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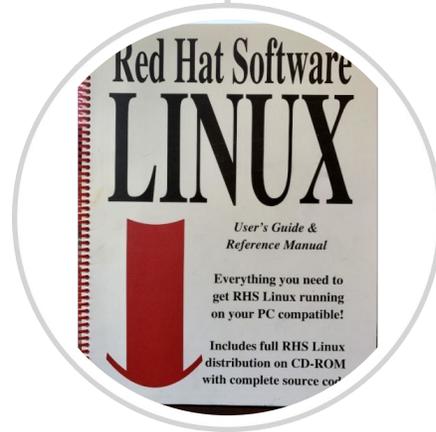


# What we'll discuss today

- ▶ Red Hat distribution history
- ▶ Current state of the ecosystem
- ▶ What's coming soon
- ▶ Q&A

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# Red Hat distribution history



1994

### Red Hat Software Linux 0.9 (Halloween)

First public release of Red Hat Linux. Was actually a paid beta release, hence the pre-1.0 version number. Physical media available for purchase for about \$40, or you could download it for free from an FTP site.



1995

**Red Hat Commercial Linux 1.0 (Mother's Day)**

First non-beta release. Subtle name change to appeal to businesses.



1995

**Red Hat Commercial Linux 1.1**



1995

**Red Hat Commercial Linux 2.0**

First release to use RPM. First release to use ELF format for libraries and binaries.



1995

**Red Hat Linux 2.1 (Bluesky)**

Subtle name change to just Red Hat Linux.



1996

**Red Hat Linux 3.0.3 (Picasso)**

Originally version 2.2, but a higher number was chosen for marketing reasons.



1996

**Red Hat Linux 4.0 (Colgate)**

First release to use kernel modules.

Red Hat distribution history



1997



Red Hat Linux 4.1 (Vanderbilt)



1997



Red Hat Linux 4.2 (Biltmore)



1997



Red Hat Linux 5.0 (Hurricane)



1998

Red Hat Linux 5.1 (Manhattan)



1998

Red Hat Linux Raw Hide 1.0

Development release of Red Hat Linux. Intended to get earlier feedback on changes to improve future releases.



1998

Red Hat Linux 5.2 (Apollo)

## Red Hat distribution history



1999

Red Hat Linux 6.0 (Hedwig)

First release to include GNOME and KDE.



1999

Red Hat Linux 6.1 (Cartman)



2000

Red Hat Linux 6.2 (Zoot)



2000

**Red Hat Linux 7 (Guinness)**

First release with Red Hat Network (RHN) support for receiving updates.



2001

**Red Hat Linux 7.1 (Seawolf)**



2001

**Red Hat Linux 7.2 (Enigma)**



2002

### Red Hat Linux Advanced Server 2.1 (Pensacola)

First release of a new distribution, based on Red Hat Linux 7.2. Later rebranded as Red Hat Enterprise Linux AS. Longer lifecycle, API guarantees, and certified ISV support.



2002

Red Hat Linux 7.3 (Valhalla)

First time there was a fourth minor version of a major version.



2002

Red Hat Linux 8.0 (Psyche)

# Fedora (Linux) Project

## Additional RPMs for Red Hat Linux

- ▶ Community project started outside of Red Hat in 2002
- ▶ Goals of providing additional RPMs for RHL and making RHL easier to use via apt and yum
- ▶ Aspired to have most popular packages “promoted” into RHL
- ▶ Originally just the Fedora Project, later renamed to the Fedora Linux Project



2003

Red Hat Linux 9 (Shrike)



2003

Red Hat Linux 9.0.93 (Severn)

Beta release of what would have become Red Hat Linux 10. The release announcement also included a notice of intention to start opening up the development process.

## RHEL Rebuilding mailing list

Dedicated to discussions about rebuilding Red Hat Enterprise Linux

- ▶ RHEL source packages were published to ftp.redhat.com
- ▶ Concept formed of using those to create a RHEL “rebuild” with trademarks removed
- ▶ Discussions started in 2003 on rhel-rebuilding-l list
- ▶ Later coalesced with other similar efforts under the cAos Foundation, which agreed to host the new rebuild distribution cAosel alongside their cAos distribution

# The Red Hat Linux Project (RHLP)

## Opening up the Red Hat Linux development process

- ▶ Not quite a real project yet, but the start of things to come
- ▶ No longer considered a Red Hat product (no more box sets)
- ▶ Public mailing lists
- ▶ Public bug tracker
- ▶ Early growing pains because change is hard
- ▶ EOL dates for previous Red Hat Linux versions announced

# The Fedora Project

Red Hat Linux Project merges with Fedora Linux Project

- ▶ Functionally, this was Red Hat Linux being rebranded and pushed out to the Fedora Linux Project
- ▶ Red Hat Linux became Fedora Core
- ▶ Fedora Linux became Fedora Extras
- ▶ Change is still hard, still plenty of growing pains



2003

### Fedora Core 0.94 (Severn)

The previous RHL Severn beta was 9.0.93, so easy to see the version continuation, just with the leading digit dropped.



2003

### Fedora Core 0.95 (Severn)



2003

### Fedora Core 1 (Yarrow)

What would have been Red Hat Linux 10.



2003

**Red Hat Enterprise Linux 3 (Taroon)**

Based on Red Hat Linux 9.



2004

**CentOS 3.1**

Culmination of RHEL rebuild effort in cAos Foundation. Based on Red Hat Enterprise Linux 3 Update 1. Community Enterprise Operating System.



2004

**CentOS 2**

Based on Red Hat Enterprise Linux 2.1 AS.



2004

Fedora Core 2 (Tettnang)



2004

Fedora Core 3 (Heidelberg)



2005

### Red Hat Enterprise Linux 4 (Nahant)

Based on Fedora Core 3. First Red Hat Enterprise Linux release based on Fedora Core and not Red Hat Linux.



2005

### CentOS 4

Based on Red Hat Enterprise Linux 4.

# CentOS leaves cAos Foundation

Separating to launch an independent project

- ▶ By 2005, tensions led to a reorganization
- ▶ Active CentOS developers agreed to leave the cAos Foundation
- ▶ The cAos distribution never really gained much traction, but CentOS did



2005

Fedora Core 4 (Stentz)



2006

Fedora Core 5 (Bordeaux)



2006

Fedora Core 6 (Zod)



2007

Red Hat Enterprise Linux 5.0 (Tikanga)

Based on Fedora Core 6.

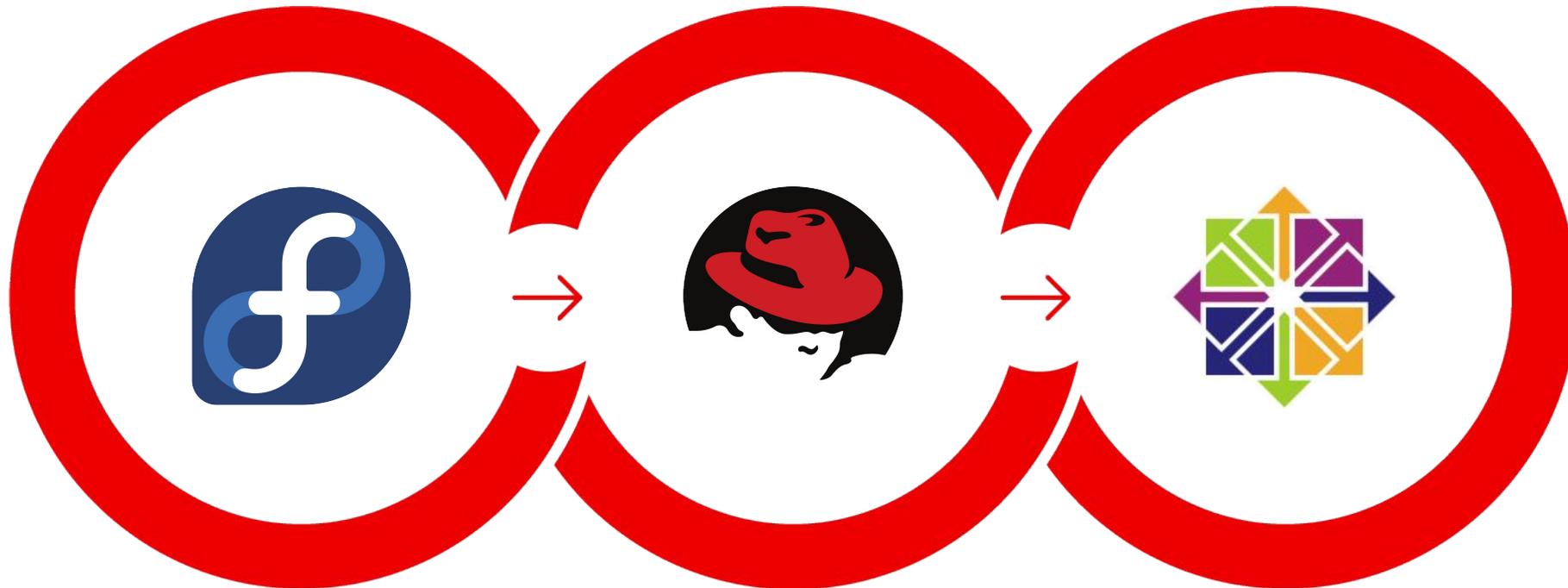


2007

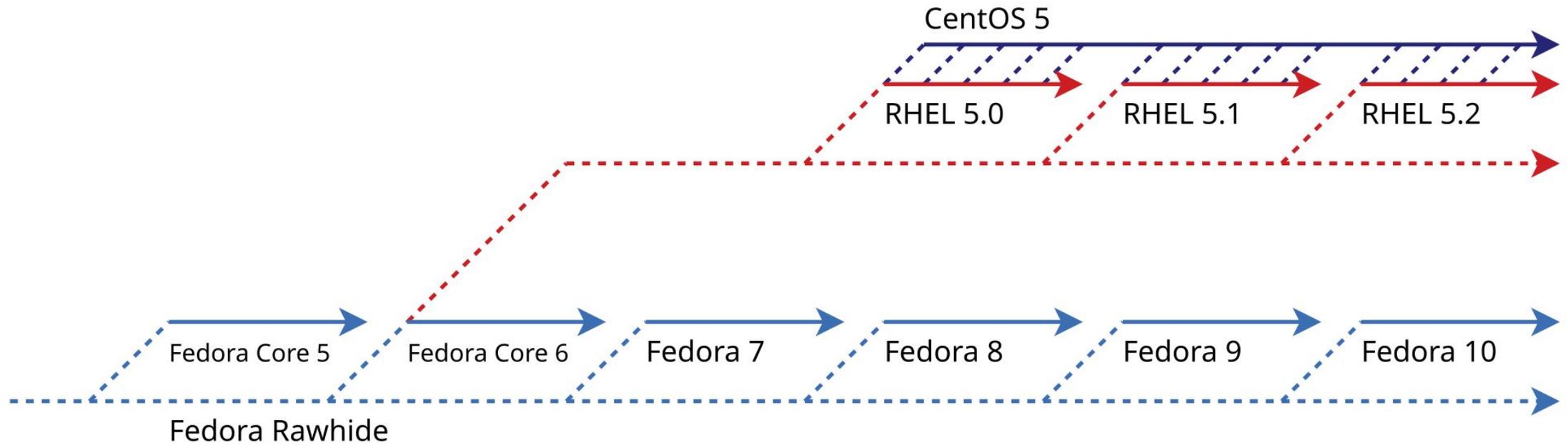
CentOS 5.0

Based on Red Hat Enterprise Linux 5.0.

## RHEL 5 distribution pipeline



# RHEL 5 distribution pipeline





2007

### Fedora 7 (Moonshine)

Fedora Core and Fedora Extras were merged to make all development public. EPEL was introduced.



2007

### Fedora 8 (Werewolf)

First release completely planned and assembled in the open as a community project.

# EPEL

## Extra Packages for Enterprise Linux

- ▶ The need for additional packages still existed
- ▶ Similar to how the original Fedora Linux Project provided additional packages for Red Hat Linux, the newer Fedora Project decided to provide additional packages for Red Hat Enterprise Linux
- ▶ These were Fedora packages rebuilt to work with Red Hat Enterprise Linux



2008



Fedora 9 (Sulphur)



2008



Fedora 10 (Cambridge)



2009

Fedora 11 (Leonidas)



2009

Fedora 12 (Constantine)



2010



Fedora 13 (Goddard)



2010



Fedora 14 (Laughlin)



2010

**Red Hat Enterprise Linux 6.0 (Santiago)**

Based on Fedora 12.



2011

**CentOS 6.0**

Based on Red Hat Enterprise Linux 6.0.



2011

Fedora 15 (Lovelock)



2011

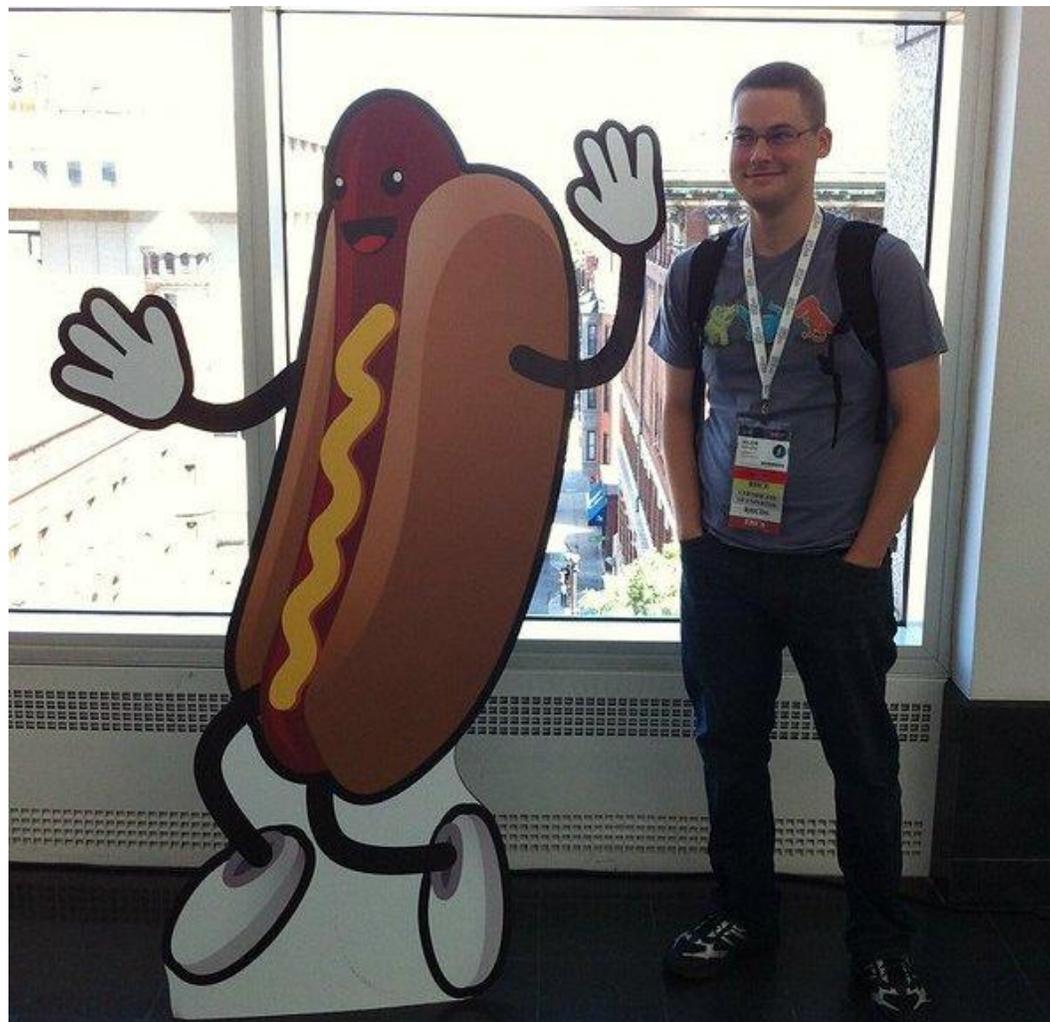
Fedora 16 (Verne)



2012

Fedora 17 (Beefy Miracle)

## Beefy Miracle





2013



Fedora 18 (Spherical Cow)



2013



Fedora 19 (Schrödinger's Cat)



2013



Fedora 20 (Heisenbug)

# Red Hat and CentOS join forces

A.K.A the “aqui-hire”

- ▶ Delays in CentOS 6 brought attention to how CentOS was being used by Red Hat teams as a development platform
- ▶ Job offers from Red Hat to CentOS developers to continue building CentOS (most accepted)
- ▶ Announced in 2014



2014

**Red Hat Enterprise Linux 7.0 (Maipo)**

Based on Fedora 19.

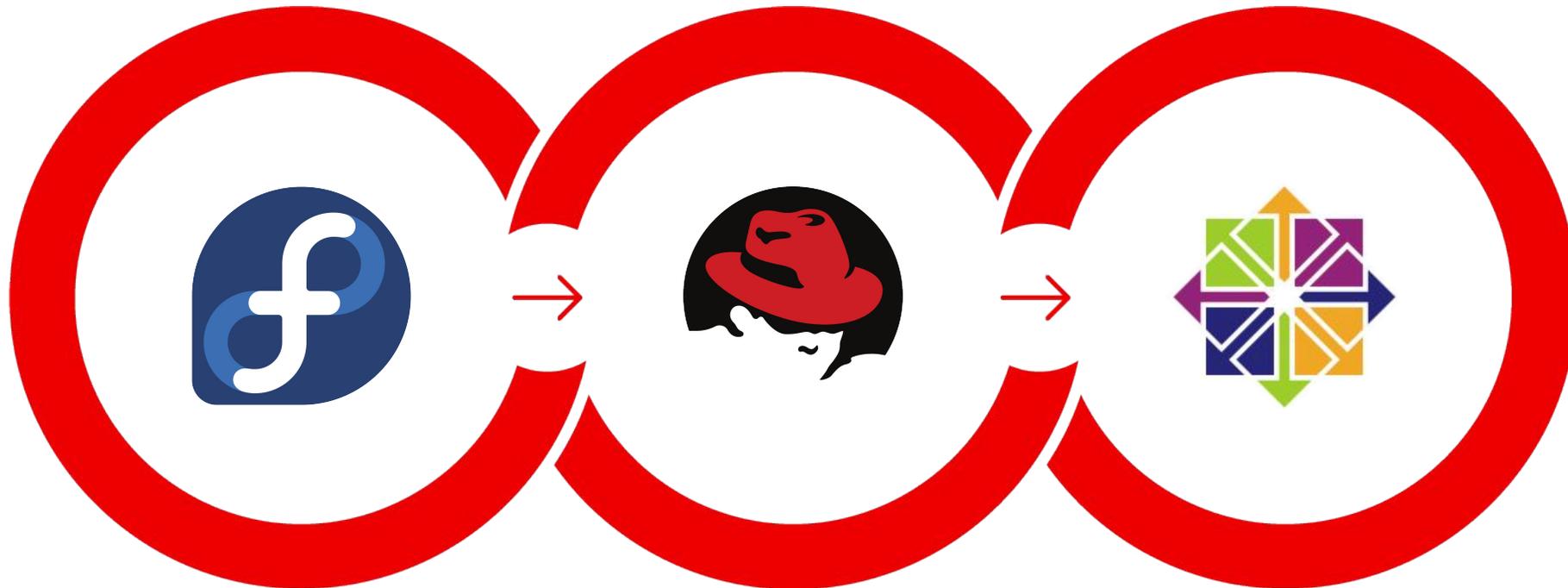


2014

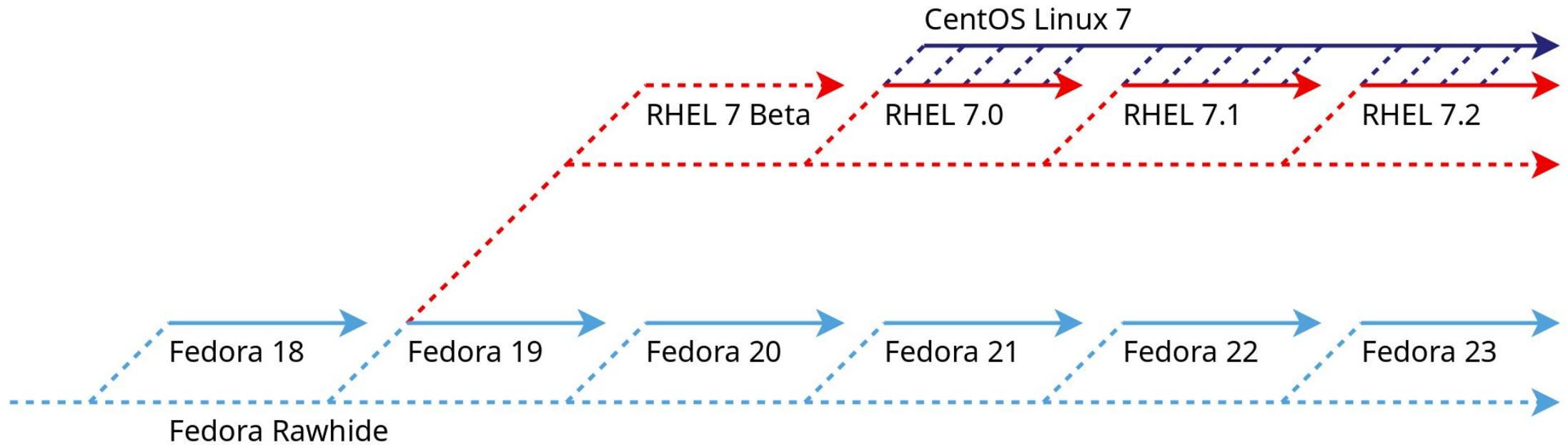
**CentOS Linux 7.0**

Based on Red Hat Enterprise Linux 7.0.

## RHEL 7 distribution pipeline



# RHEL 7 distribution pipeline



# Rebuild problems

Bug-for-bug is not all it's cracked up to be

- ▶ Matching another distro as close as possible means you can't fix bugs
- ▶ Bugs filed by users closed as WONTFIX
- ▶ Contributions that improve the operating system were not allowed
- ▶ No one actually needs bug-for-bug compatibility, they need an operating system that works

# RHEL problems

“Throw it over the wall” open source

- ▶ Private development
- ▶ Long feedback cycles
- ▶ Difficult for the general public to contribute to it
- ▶ Contributing to Fedora might get a change into the next major version
- ▶ No way to contribute to the next minor version of an existing major version

# Moving CentOS upstream of RHEL

Opening up the RHEL development process

- ▶ CentOS Project would be able to accept contributions
- ▶ CentOS Project would be able to fix bugs
- ▶ RHEL maintainers would become CentOS maintainers



2018

Fedora 28



2019

Red Hat Enterprise Linux 8.0 (Ootpa)

Based on Fedora 28.

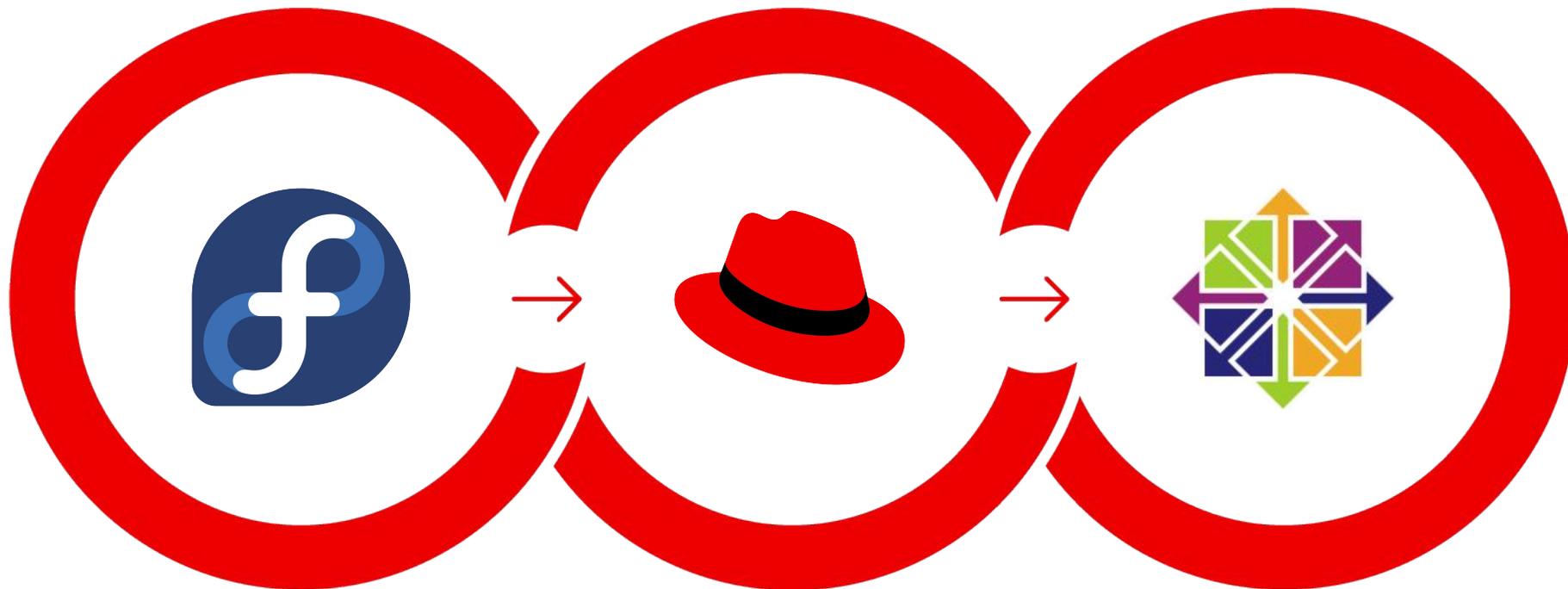


2019

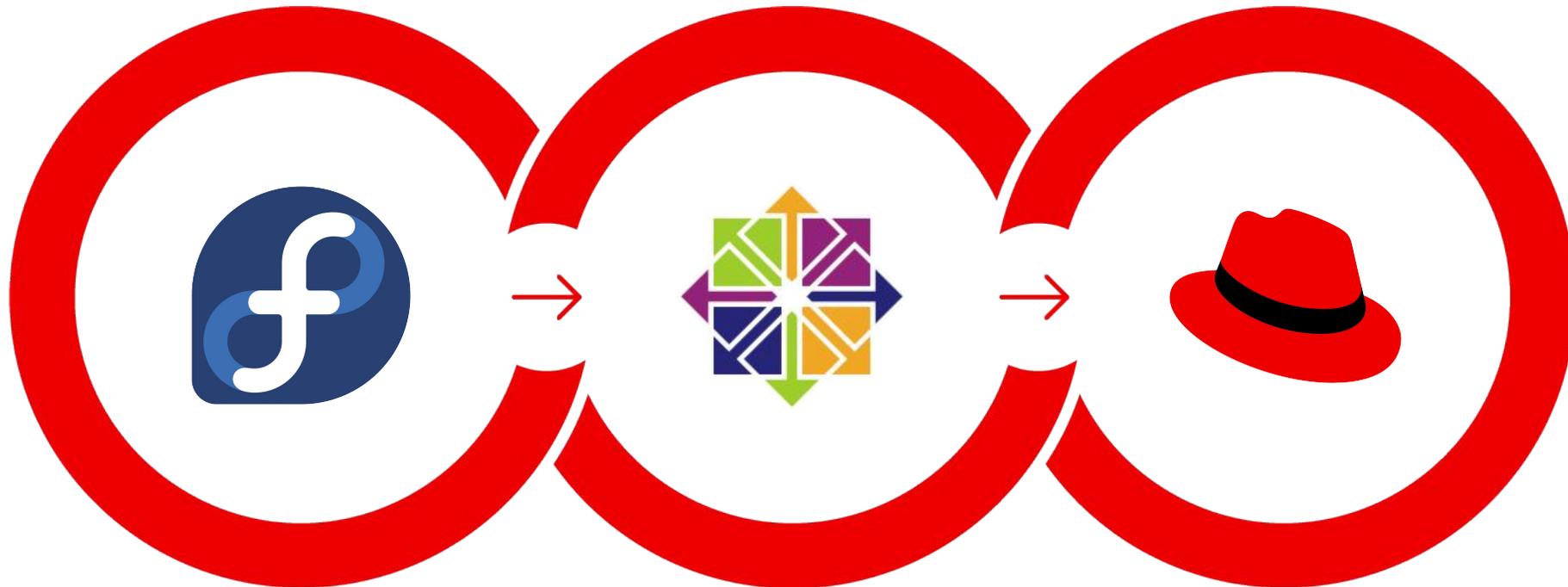
CentOS Linux 8.0 and CentOS Stream 8

Based on Red Hat Enterprise Linux 8.0.

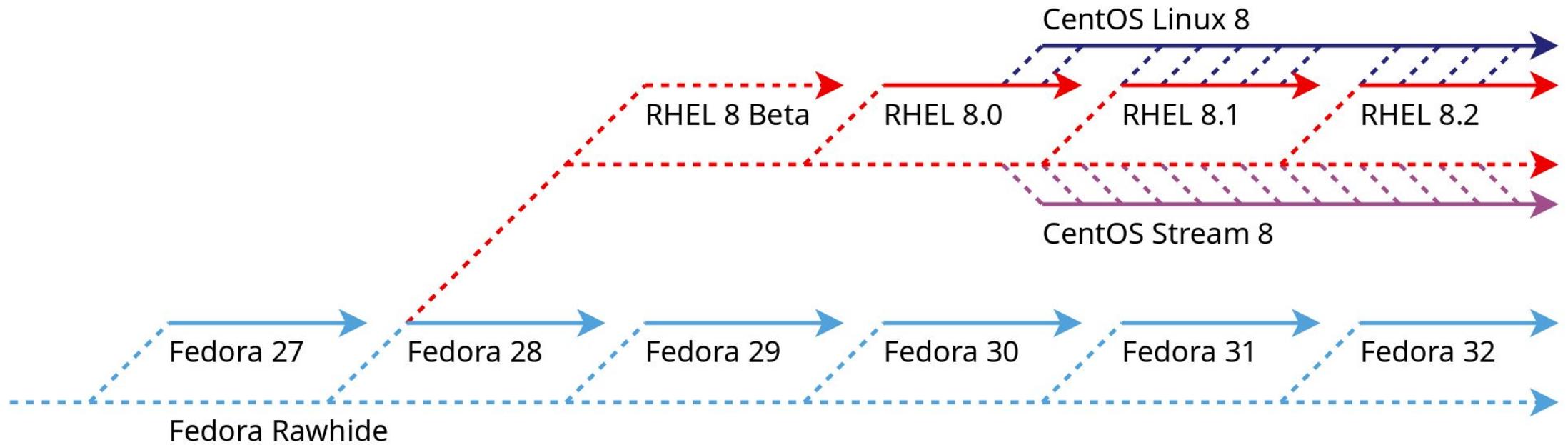
## RHEL 8 aspirational goal



## RHEL 8 aspirational goal



# RHEL 8 reality



# CentOS Linux 8 EOL date announcement

## The future of the CentOS Project is CentOS Stream

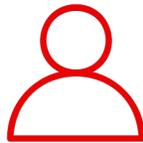
- ▶ Doing two variants of the same major version was a mistake.
- ▶ Decision was made to cut losses and focus on CentOS Stream.
- ▶ In December 2020, the project announced that CentOS Linux 8 would be EOL at the end of 2021.
- ▶ Most people expected it to be 2029, matching the RHEL 8 EOL date.
- ▶ Expanded free RHEL programs announced, but not yet available

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# Current state of the ecosystem

# Free RHEL programs

Subscription manager isn't *that* bad



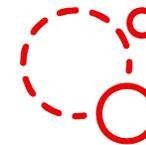
## Developer Subscription for Individuals

16 free instances of RHEL for individuals to use for production, testing, development, home lab, exam preparation, etc.



## Developer Subscription for Teams

Free non-production RHEL for customers paying for RHEL in their production environments



## Open Source Infrastructure Subscription

Free RHEL for open source projects, foundations, and similar organizations

Current state of the ecosystem



2021

Fedora 34



2021

CentOS Stream 9

Based on Fedora 34.

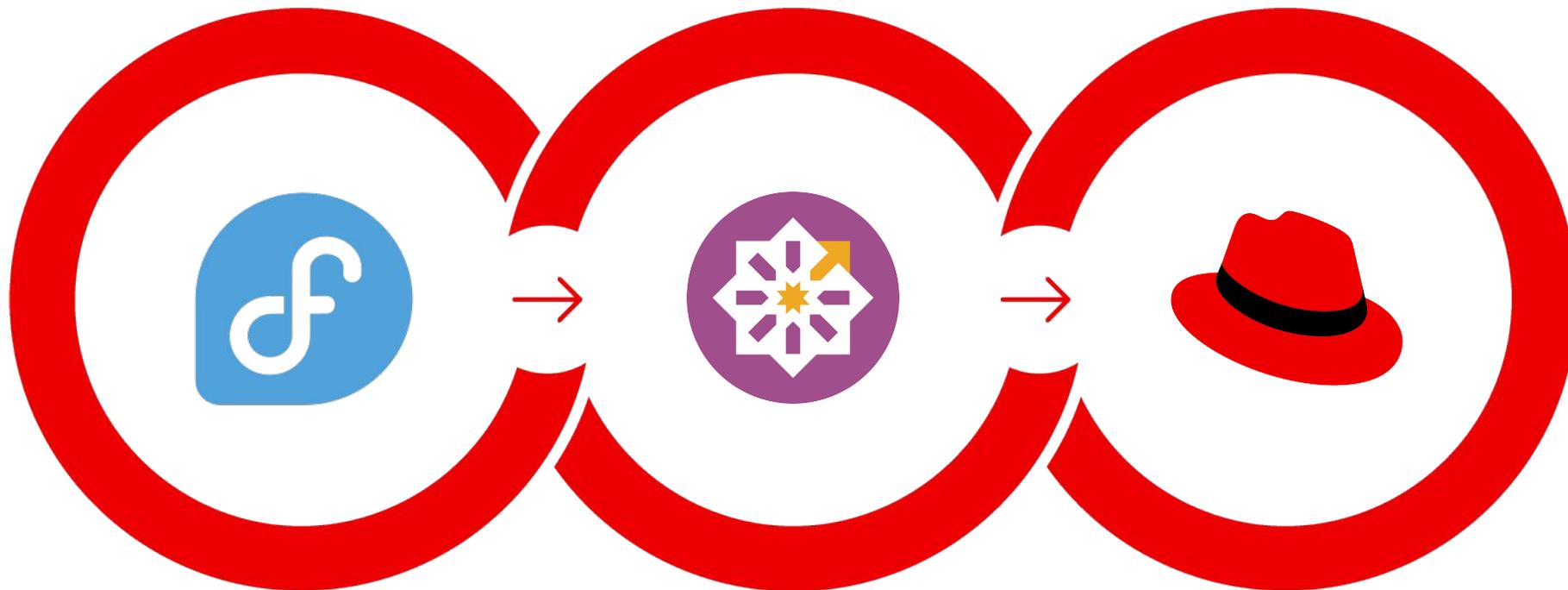


2022

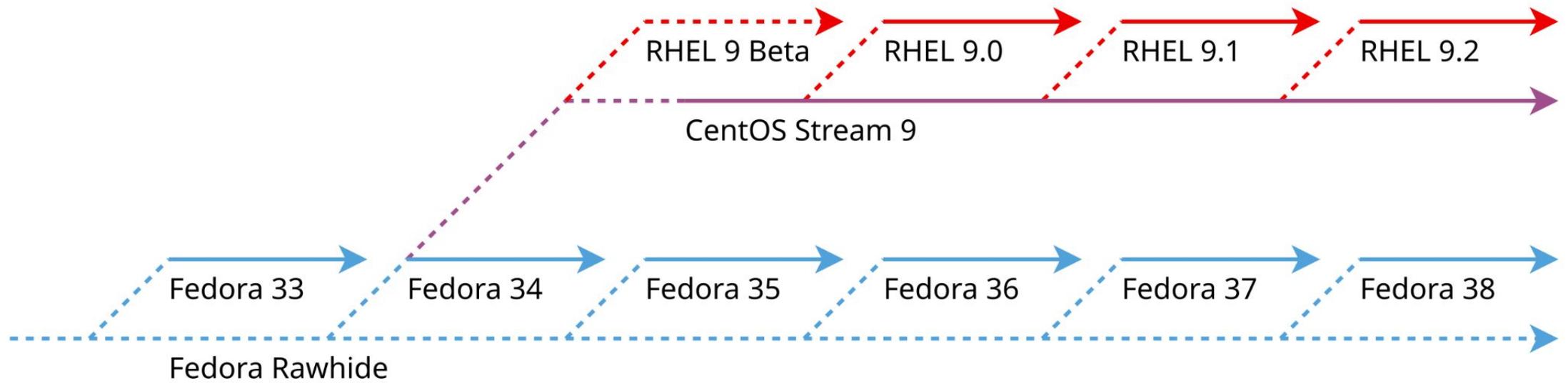
Red Hat Enterprise Linux 9.0 (Plow)

Based on CentOS Stream 9.

# RHEL 9 Distribution Pipeline



# RHEL 9 Distribution Pipeline



# The CentOS Project is thriving

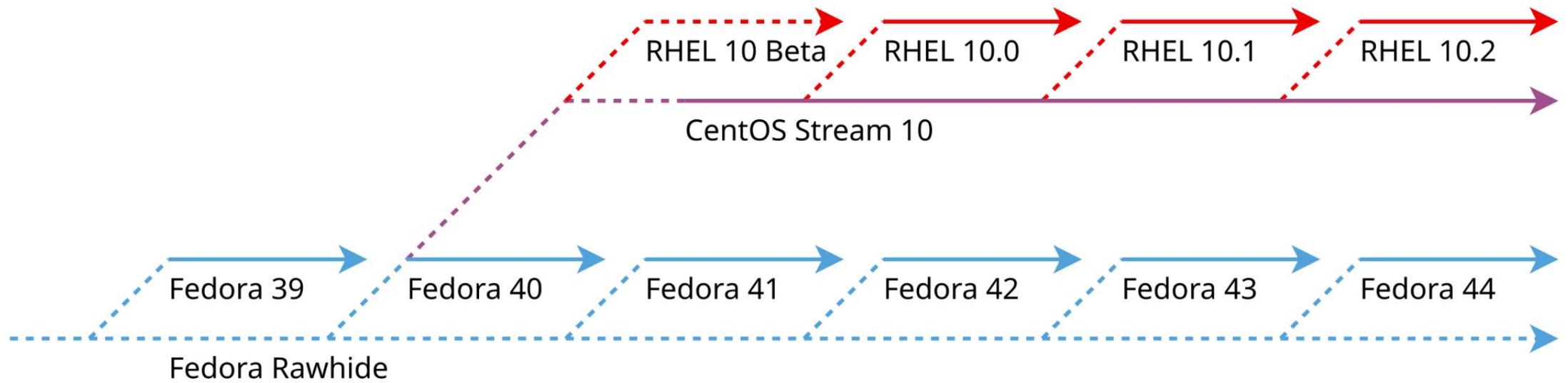
Rumors of it's demise have been greatly exaggerated

- ▶ More maintainers than ever
- ▶ More development than ever
- ▶ More community oriented than ever
- ▶ Thanks to the CentOS changes, RHEL is more open than ever
- ▶ Shorter feedback cycles
- ▶ Benefits for other projects like EPEL

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# What's coming soon

# RHEL 10



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# Q & A

# Thank you

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