

# Let's get technical & The CentOS story

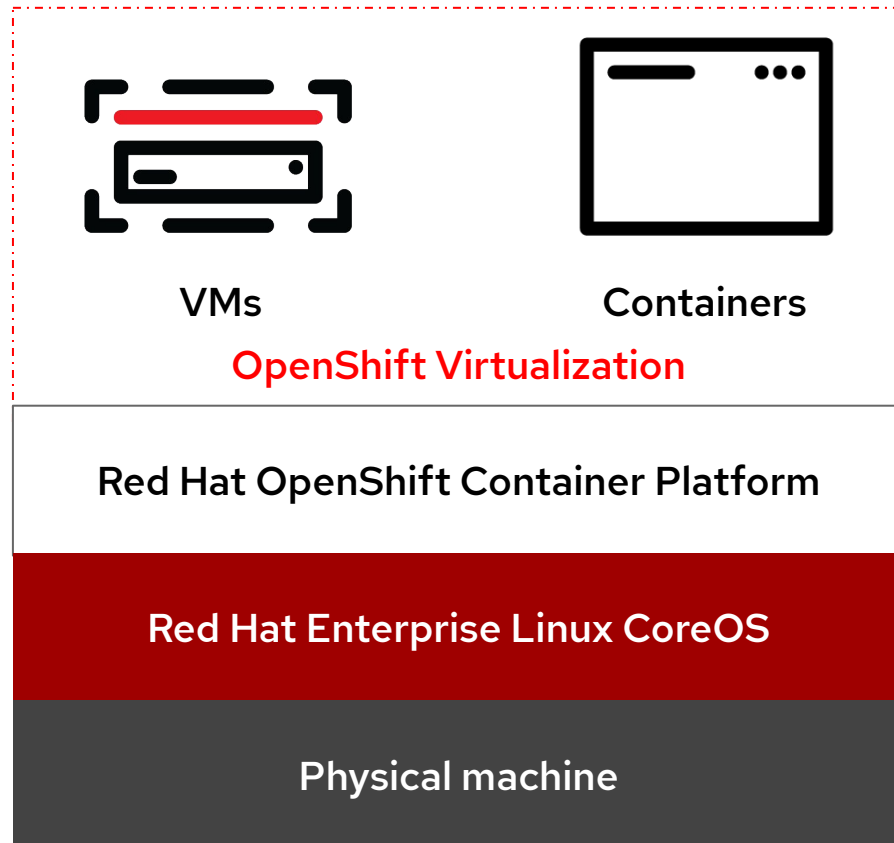
Daniel Fröhlich  
Senior Solution Architect  
dfroehli@redhat.com

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Who put that virtual  
machine into my  
container?

# OpenShift and OpenShift Virtualization

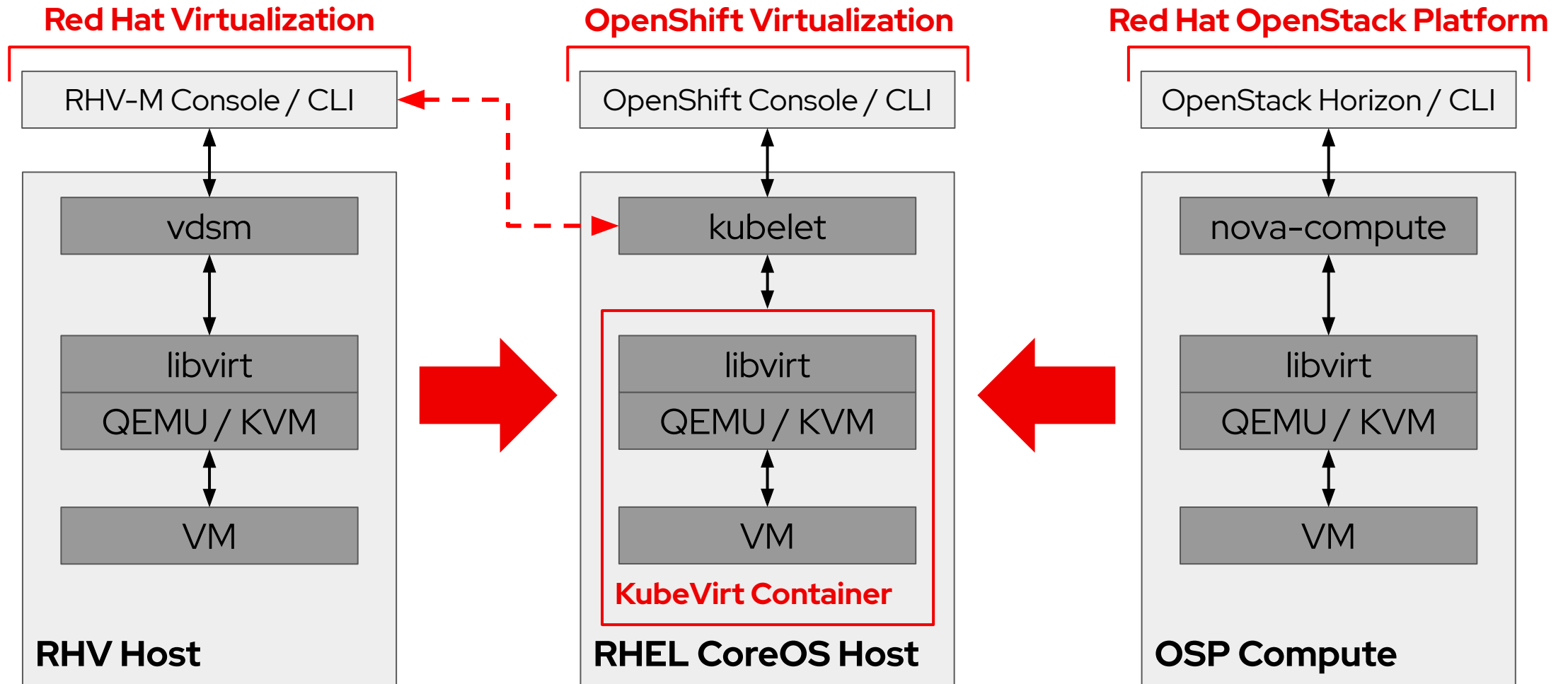
Modernized workloads, support mixed applications consisting of VMs, containers, and serverless



- Best of Both Worlds on a single platform
- Accelerates application delivery with a single platform that can manage “mixed applications” with the same tools and teams
- Add VMs to new and existing applications
- Modernize legacy VM based applications over time, or maintain them as VMs

# Containerizing KVM

Trusted, mature KVM wrapped in modern management and automation



## Seeing is believing - Demo Time - a Windows VM running in OpenShift Virtualization

The screenshot displays the OpenShift Container Platform console interface. On the left is a dark sidebar with a navigation menu. The 'Virtualization' menu item is highlighted with a red rectangular box. The main content area shows the 'Console' tab selected for a project named 'dfroehli-cnvr'. Below the navigation tabs, there is a 'VNC Console' window with a checkbox for 'Disconnect before switching' and a 'Send Key' button. The VNC console displays a Windows desktop environment with a scenic background image of a beach and rock formations. The desktop shows the time '17:09' and the date 'Dienstag, 24. November'. A text prompt 'Press Ctrl+Alt+Delete to unlock.' is visible on the screen. The top of the console shows the user 'dfroehliadm' and various utility icons.

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I am a Java guy, what's  
the fuss about  
[quarkus.io](https://quarkus.io)?

**THERE IS A NEED FOR A  
NEW JAVA STACK FOR  
CLOUD-NATIVE AND  
SERVERLESS**





# QUARKUS

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Supersonic. Subatomic. Java.



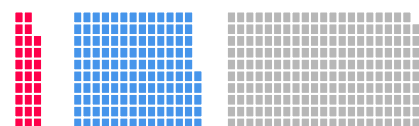


# Kubernetes-Native Java Development with Quarkus

**TIOBE : #1**  
**IEEE : #1**  
**SlashData : #2**  
**RedMonk : #2**

## Solid Foundation

Java consistently ranks in the Top 3 of programming languages in use today with a community of 7-10 million developers.



## Stunning Performance

Optimized to provide native-level memory footprint and startup time, allowing for increased density, performance and elasticity at lower cost.



## Toolchain

End-to-end toolchain including OpenShift Developer Console, Code Ready Workspaces, project generators in IDE and web, live-reload for lightning fast inner loop workflow, and Tekton pipelines integration.



## Community

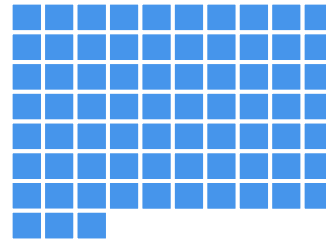
Large catalog of extensions connects your applications with best of breed-technologies including Camel, Jaeger, Prometheus, Istio, Kafka and more.

# Developer Joy and Operational Excellence

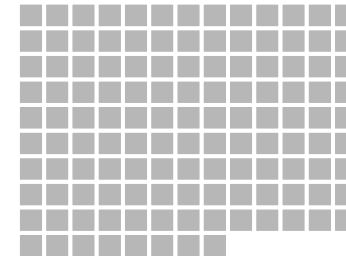
- Improved memory efficiency
- Increased Deployment Density
- Faster startup
- Smaller disk foot-print



Quarkus + Native



Quarkus + JVM



Traditional  
Cloud-Native Stack

# Use Cases

Quarkus is great for..



## Kubernetes-native

Low memory footprint + lightning fast startup time + small disk footprint = an ideal runtime for Kubernetes-native microservices



## MONO >> MICRO >> FUNCTIONS

Quarkus is a great choice to modernize existing monolithic applications by breaking it into smaller, loosely coupled microservices.



## SERVERLESS

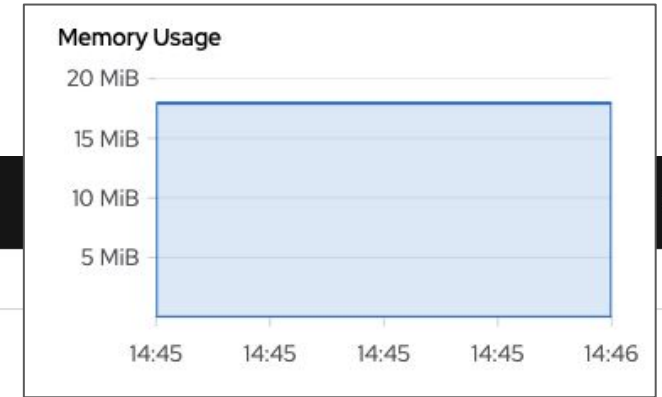
Scaling up or down (0) is extremely fast with Quarkus making it an ideal runtime for creating serverless applications.



## EVENT-DRIVEN/REACTIVE

Quarkus utilizes an asynchronous, reactive event loop that makes it easy to create reactive applications.

Seeing is believing - Demo Time - a Quarkus REST service starting in less then 20msec



Red Hat OpenShift Container Platform

- Home
- Overview
- Projects
- Search
- Explore
- Events
- Operators
- Workloads
- Pods
- Virtualization
- Deployments

Project: dfroehli-quarkus

Pods > Pod Details

**quarkus-rest-6d97f47dd8-2wl98** Running

Details | YAML | Environment | **Logs** | Events | Terminal

Log streaming... quarkus-rest

8 lines

```
2021-05-25 12:31:46,902 INFO [io.quarkus] (main) quarkus-rest 1.0.0-SNAPSHOT native (powered by Quarkus 1.13.4.Final) started in 0.017s. Listening on: http://0.0.0.0:8080
2021-05-25 12:31:46,902 INFO [io.quarkus] (main) Profile prod activated.
2021-05-25 12:31:46,902 INFO [io.quarkus] (main) Installed features: [cdi, resteasy, smallrye-openapi, swagger-ui]
```

Repositories oschneid / quarkus-rest

Repository Tags

TAG	LAST MODIFIED	SECURITY SCAN	SIZE	MANIFEST
latest	4 days ago	3 High	50.8 MB	SHA256 16620cfbe04e

## Quarkus Extensions

RESTEasy

Netty

Hibernate ORM

Spring Compat.

MP OpenAPI

MP JWT

Eclipse Vert.X

Agroal (conn pool)

Narayana JTA

MP Reactive  
Messaging

Apache Camel

...

Quarkus Core

Jandex

Gizmo

Graal SDK

Arc (DI)

JIT (OpenJDK) HotSpot

AOTC (GraalVM Native Image)



# The Right VM For the Right Deployment

## JIT (OpenJDK HotSpot)

High memory density requirements  
High request/s/MB  
Fast startup time

Best raw performance (CPU)  
Best garbage collectors  
Higher heap size usage

Known monitoring tools  
Compile Once, Run anywhere  
Libraries that only works in standard JDK

## AOT (GraalVM native image)\*

Highest memory density requirements  
Highest request/s/MB  
for low heap size usages  
Faster startup time  
10s of ms for Serverless



\*Currently in Tech Preview



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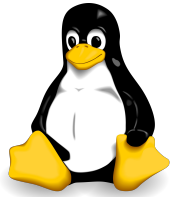
# The CentOS story

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# Red Hat and CentOS History



# Code that is developed upstream of us gets pulled into Fedora first



Linux Kernel

Fedora

Red Hat Enterprise Linux

CentOS Linux

Community space

Private space

Partner, Upstream, Community



**Audience:**  
Developers



**Audience:**  
Enterprises  
Application development partners



**Audience:**  
Cost-sensitive users  
Ecosystem developers



**Focus:**  
OS innovation, architecture changes



**Focus:**  
Stability, security, and performance



**Focus:**  
No cost and easy to acquire



**Pace:**  
Fast moving: major release  
every 6 months



**Pace:**  
Predictable release cadence

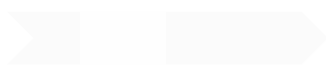


**Pace:**  
Released several months after  
Red Hat Enterprise Linux

# Every three years, we fork Fedora's code and make it into RHEL



Linux Kernel



Fedora



Red Hat Enterprise Linux



CentOS Linux

Community space

Private space

Partner, Upstream, Community



**Audience:**  
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**Audience:**  
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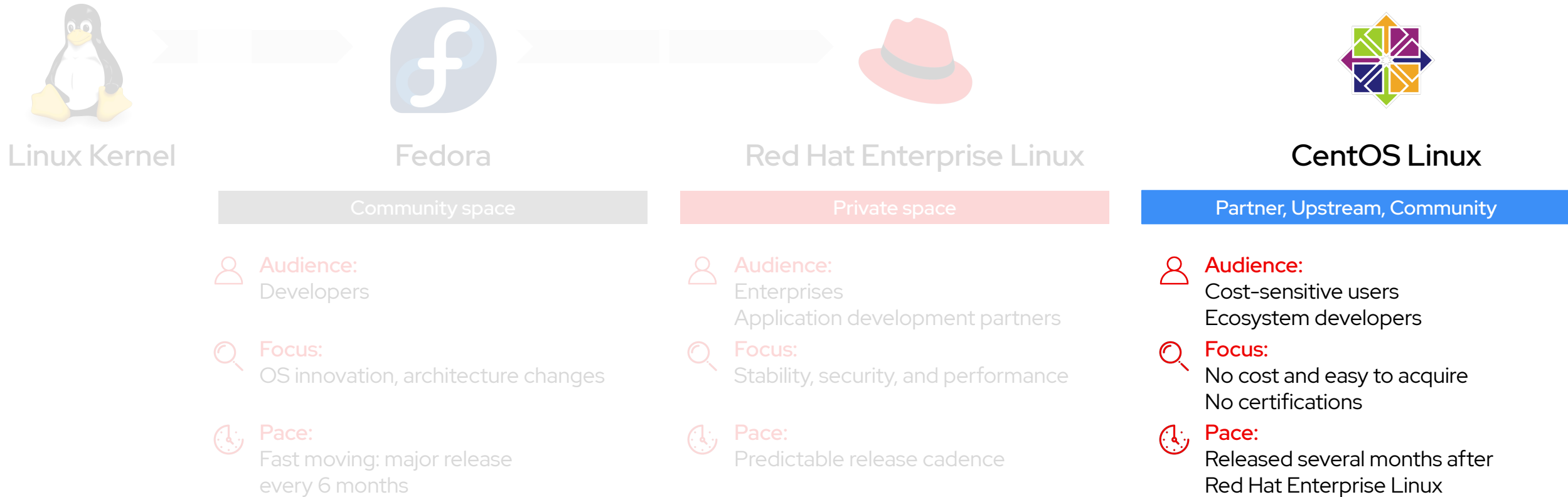


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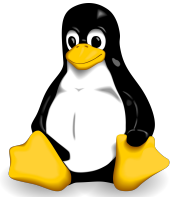


**Pace:**  
Released several months after Red Hat Enterprise Linux

# After we build RHEL, the same source gets rebuilt as CentOS Linux



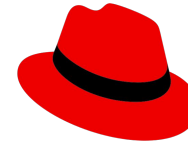
# Enterprise Linux Ecosystem (Circa 2014)



Linux Kernel



Fedora



Red Hat Enterprise Linux



CentOS Linux

Community space

Private space

Partner, Upstream, Community

- Audience:**  
Developers
- Focus:**  
OS innovation, architecture changes
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Fast moving: major release every 6 months

- Audience:**  
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Certifications
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- Audience:**  
Cost-sensitive users  
Ecosystem developers
- Focus:**  
No cost and easy to acquire  
No certifications
- Pace:**  
Released several months after  
Red Hat Enterprise Linux

## The Industry has Changed

- ▶ A healthy, sustainable ecosystem requires continuous value creation from all participants.
- ▶ Traditional hardware roadmaps are accelerating, making them more difficult to align.
- ▶ New methods like DevOps encourage constant change.
- ▶ Containers disrupt historic operating system deployment patterns.
- ▶ Markets like Telco and Edge require new partners, and these partners will be innovating in new areas and require a fast cycle of changes.

*Existing engagement through the downstream CentOS Linux model cannot serve these challenges.*

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# What was announced



# CentOS Stream

## What is it?

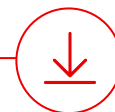
**CentOS Stream is a Linux development platform**

from the CentOS Project designed to increase transparency and collaboration around the Red Hat® Enterprise Linux® development process.

Open to anyone, CentOS Stream is the development stream of the next minor release of Red Hat Enterprise Linux.

It allows developers, partners, and end customers a more streamlined process for influencing Red Hat Enterprise Linux and by extension their future infrastructure or ecosystem.

## Where can you get it?



<https://centos.org/download>

# Enterprise Linux Ecosystem (circa 2021)



Fedora

CentOS Stream

Red Hat Enterprise Linux

Linux Kernel

Community space

Shared space

Private space

- ▶ Contributions welcomed and encouraged
- ▶ A packaged integration of upstream
- ▶ Take risks, do experiments
- ▶ An Open Source community
- ▶ Focused on more than the Enterprise

- ▶ Contributions welcomed and encouraged
- ▶ Variants are encouraged through Special Interest Groups ("SIGs")
- ▶ Contributions curated by Red Hat
- ▶ Continuously delivers the next minor version of Red Hat Enterprise Linux
- ▶ Focused on the future of the Enterprise

- ▶ Private until after release
- ▶ NDA and CVE work
- ▶ Accessible only via subscription
- ▶ Focused on today's Enterprise
- ▶ Certifications

- Operating System developers
- OS innovation, architecture changes
- Fast moving, major release every 6 months

- Community and partners
- Develop, test, contribute to next version of RHEL
- Continuous stream of new content

- RHEL customers and partners
- Stability, security, performance
- Predictable release cadence



# Which Platform is Right for You?

- ▶ Operating System development and desktop use cases: **Fedora**
- ▶ Hassle-free and secure OS for your home lab: **Red Hat Developer program** ([developers.redhat.com](https://developers.redhat.com))
- ▶ Dev & CI/CD to ensure RHEL compatibility: **Red Hat Developer program** ([developers.redhat.com](https://developers.redhat.com))
- ▶ Dev & CI/CD to ensure RHEL+1 compatibility: **CentOS Stream**
- ▶ Developing containerized applications: **RHEL UBI**
- ▶ Participate in RHEL development: **CentOS Stream**
- ▶ Running mission critical workloads: **RHEL**
- ▶ Developing software for resale or hardware: **Red Hat Partner Connect Program** ([connect.redhat.com](https://connect.redhat.com))