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# Understanding DevOps

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DevOps is an approach to culture, automation, and platform design intended to deliver increased business value and responsiveness through rapid, high-quality service delivery. This is all made possible through fast-paced, iterative IT service delivery. DevOps means linking legacy apps with newer cloud-native apps and infrastructure.

The graphic features a white background with a red border. On the left, there is a small image of a Red Hat webinar slide with the text "Start your DevOps transformation with Red Hat Training". To the right of this image is a red-outlined rectangular button with the text "Watch the webinar". Above the button, the text "Start your DevOps transformation with Red Hat Training" is written in a bold, black font.

## What is DevOps, anyway?

The word "DevOps" is a mashup of "development" and "operations" but it represents a set of ideas and practices much larger than those two terms alone, or together. DevOps includes security, collaborative ways of working, data analytics, and many other things. But what is it?

DevOps describes approaches to speeding up the processes by which an idea (like a new software feature, a request for enhancement, or a bug fix) goes from development to deployment in a production environment where it can provide value to the user. These approaches require that development teams and operations teams communicate frequently and approach their work with empathy for their teammates. Scalability and flexible provisioning are also necessary. With DevOps, those that need power the most, get it—through self service and automation. Developers, usually coding in a standard development environment, work closely with IT operations to speed software builds, tests, and releases—without sacrificing reliability.

Of course, this means more frequent changes to code and more dynamic infrastructure usage. Traditional management strategies can't keep up with this kind of demand. You're going to need to change a few things to give you an edge.

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## What do containers have to do with DevOps?

DevOps speeds up how an idea goes from development to deployment. At its core, DevOps relies on automating routine operational tasks and standardizing environments across an app's lifecycle. Containers can offer standardized environments, but you need a platform to manage them that also offers built-in automations and support for any infrastructure. Red Hat OpenShift 4 is the enterprise-ready Kubernetes platform to support DevOps initiatives.

**See what OpenShift can do**

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## DevOps culture

DevOps relies on a culture of collaboration that aligns with open source principles and transparent, agile approaches to work. You can immerse yourself in an exploration of how DevOps and agile values intertwine in our 5-day master class, DevOps Culture and Practice Enablement (DO500).

The culture of open source software projects can be a blueprint for how to build a DevOps culture. Freely sharing information is the default approach to collaboration in open source communities. It can help to implement cultural changes like promoting transparency in decision-making, encouraging experimentation by eliminating the fear of failure, or implementing a reward system that encourages trust and collaboration. Many organizations look into digital transformation consulting services to support these kinds of initiatives.

With the right leadership and incentive programs in place, your development and operations teams can help to facilitate an open culture. But DevOps becomes most effective when this culture is spread throughout the organization. Sure, the name refers to development and operations, but DevOps is for everyone.

The culture at Red Hat is built on openness and transparency. And it's worked for us for more than 25 years. When it comes to helping customers adopt an open approach, we've got the history to guide you through making DevOps a reality.

## Learn more about transforming your organization



### Season 1, Episode 4: DevOps\_Tear Down That Wall

Hear Saron Yitbarek, Scott Hanselman, and Gordon Haff talk about DevOps culture, process, platforms and tools in this clip from Command Line Heroes podcast

[Listen to Season 1, Episode 4](#)

## DevOps process

Developing modern applications requires different processes than the approaches of the past. Many teams use agile approaches to software development. For these teams, DevOps is not an afterthought. In fact, "Customer satisfaction through early and continuous software delivery" is the first of 12 principles in the Agile Manifesto. That's why continuous integration and continuous deployment (CI/CD) is so important to DevOps teams.

But just changing your development and operations processes isn't enough. You'll need to apply systems thinking to really optimize the way you deliver software. This means DevOps will lead to changes in the business units that request dev work and in the groups that support the end users. A continuous cycle of feedback from end users to the business is the key.

Your process will need to change beyond HOW you do the work. It's inevitable that WHAT work you do will change too. DevOps isn't just about speeding up creation of the same old monolithic software it's about creating new kinds of software better suited to this cadence of continuous delivery.

That's why DevOps teams will often build their software using a microservices architecture and link these services together with APIs. Teams deliver faster by focusing on creating smaller pieces of functionality so you'll have to focus on how those services and APIs are managed and have a strategy, like agile integration, for bringing it all together.

Making these kinds of changes can take a lot of effort but with the right technology you can get started right away. Automation can help you speed up your processes—and eventually migrate your DevOps workloads to the cloud. An IDC study<sup>1</sup> shows that 85% of IT leaders say automation is critical to their DevOps strategy. That's because automation lets an infrastructure withstand the constant code changes that come with DevOps. And it allows environments to continuously scale with ease. Automation helps your smartest people do the most important things by lifting the burden of mundane and repetitive tasks.

Our experts can help your organization develop the practices, tools, and culture needed to more efficiently modernize existing applications and to build new ones.

<sup>1</sup> IDC. (2018, March). Automation, DevOps, and the Demands of a Multicloud World. Retrieved from <https://www.redhat.com/cms/managed-files/cm-idc-automation-devops-demands-multicloud-world-f10589-201803-en.pdf>

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## DevOps platform & tools

Selecting tools that support your processes is critical for DevOps to be successful. If your operations are going to keep pace with rapid development cycles they'll need to use highly flexible platforms and treat their infrastructure like dev teams treat code. Manual deployments are slow and leave room for error.

Platform provisioning and deployment can be simplified through automation. Site reliability engineering (SRE) takes these manually operations tasks and manages them using software and automation. An SRE approach can further support the goals of a DevOps team.

Containers make it easier to move applications between development, testing, and production environments. Using containers lets developers package and isolate their apps with everything they need to run, including application files, runtime environments, dependent libraries and configurations.

**Learn more about how containers can make things easier**

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## DevOps and Kubernetes

The DevOps approach goes hand-in-hand with Linux<sup>®</sup> containers, which give your team the underlying technology needed for a cloud-native development style. Containers support a unified environment for development, delivery, integration, and automation.

And Kubernetes is the modern way to automate Linux container operations. Kubernetes helps you easily and efficiently manage clusters running Linux containers across public, private, or hybrid clouds.

Choosing reliable platforms, both inside and outside the container—like Red Hat<sup>®</sup> Enterprise Linux and Red Hat OpenShift<sup>®</sup>—ensures that scaling and automation won't fail when you need it most. With the right platforms, you can best take advantage of the culture and process changes you've implemented.

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## DevOps helps you scale through continuous deployment

A major outcome of implementing DevOps is a continuous integration and continuous deployment pipeline (CI/CD). CI/CD helps you deliver apps to customers frequently and validate software quality with minimal human intervention.

Specifically, CI/CD introduces ongoing automation and continuous monitoring throughout the lifecycle of apps, from integration and testing phases to delivery and deployment, so you can quickly identify and correct problems and defects. Taken together, these connected practices are often referred to as a "CI/CD pipeline" and are supported by development and operations teams working together in an agile way.

**Read more**

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## Is your team ready to innovate?

To compete in today's market, you need more than technology. Measure your organization's cultural, process, and platform maturity and learn the steps you need to take on your path to digital transformation.

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## DevOps & security

As we mentioned earlier, DevOps isn't just about development and operations teams. In order to take full advantage of a DevOps approach, organizations must consider how security plays a role in the life cycle of their apps. This means thinking about core security from the planning phase onward. It also means automating some security features to keep the DevOps workflow from slowing down. Selecting the right tools to integrate security can help meet your DevOps security goals.

But effective DevOps security requires more than new tools—it builds on the cultural changes of DevOps to integrate the work of security teams sooner rather than later. DevOps speeds things up by closing the gap between development and operations, but the speed gained can be undermined by poor security planning.

Security used to be the exclusive responsibility of an isolated team—tacked on in the final stage of development. Now, in a collaborative DevOps framework, security is a shared responsibility, integrated from the start.

**Learn more about DevSecOps**

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If you want to take full advantage of the agility and responsiveness of DevOps, IT security must play a role in the full life cycle of your apps.

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CI/CD introduces ongoing automation and continuous monitoring throughout the lifecycle of apps, from integration and testing phases to delivery and deployment.

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**DevOps engineer?**  
A DevOps engineer has a unique combination of skills and expertise that enables collaboration, innovation, and cultural shifts within an organization.

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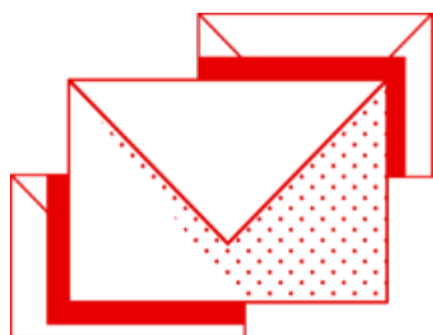
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