

# Taking DevOps to a New Level With Modern Developer Workspaces

**MARKET TRENDS REPORT**



# Introduction

---

In the past several years, federal agencies have made significant progress with moving workloads to the cloud. Although agencies have been able to “lift and shift” some existing applications to the cloud fairly easily, they have discovered that many simply can’t make the journey. Instead, agencies are turning to more modern, cloud-based application development processes such as DevOps and containerized approaches to develop cloud-native applications.

DevOps and other agile programming approaches have many benefits — significantly shorter development cycles, faster innovation, better quality, fewer deployment failures and lower costs — but they can also cause complications. It can take weeks or longer to onboard developers, make sure that projects are fully secure during development, and ensure that all project members are collaborating effectively and using the same version of resources.

One way to address these challenges is by moving application development activities to a browser-based integrated development environment (IDE). Typically accessed from a web browser, this approach can speed up the DevOps process and make it much more collaborative and secure.

With a consistent, security-focused, web-based and zero-configuration application development environment, agencies can reap the benefits of modern application development approaches such as DevOps. To learn more about how agencies can improve code development with secure, sharable developer workspaces, GovLoop teamed with Red Hat, which provides tools designed to make open source code development easier, more effective and securer.

# By the Numbers

---

51 years

is the age of the oldest system still in use in the federal government

---

80%

of U.S. government IT spending is spent on maintenance of legacy IT systems

---

62%

of IT decision-makers say they expect their organizations to mainstream containers within one year

---

84%

of developers use containers in production, up more than 15% from 2018

---

50%

of new software is developed only in the cloud

---

62%

of federal government agencies have moved at least some applications to the cloud

---

2014

is when the federal government issued the Digital Services Playbook, which encourages more agile use of reusable software, with an emphasis on open source.

---

\$6 billion

is the amount the federal government spends each year on software, representing 7% of the IT budget of the Chief Financial Officers Act agencies

---

59%

of IT professionals at larger organizations run Kubernetes in a production environment, with 20% running more than 50 clusters

---

# The Case for a Cloud-Native Collaborative Platform

---

## **The Challenge: Getting from Zero to 60**

Transitioning from traditional application development to more modern, cloud-focused approaches like DevOps requires different processes for almost everything. Because DevOps focuses on releasing code quickly, factors such as continuous collaboration, accurate handoffs between team members and faster developer onboarding become more important than ever.

As noted earlier, onboarding developers to a project — whether they are new to the organization or new to the project — can take several weeks or longer. During that time, new team members familiarize themselves with resources and rules, set up a workstation, undergo training, and ease into the role. The longer it takes for developer onboarding, the longer it will take for the team to get things done.

Another challenge for DevOps teams is ensuring consistency. Efficiency and frequent code releases require all developers to use the same technology stack, with the same tools and processes, but that can be difficult to ensure. Consistency also requires that all developers work on the same version at all times.

Some organizations try to address this issue by putting all developer tools into a container that the operations team also uses, but that's a dangerous proposition. "You shouldn't put development tools into production containers," said Jason Dudash, a Principal Solutions Architect at Red Hat. "It can open you up for security issues and cause the containers to become too large to be really effective."

Security is another major area of concern. Because DevOps is meant to drastically reduce the time it takes to build and release code, teams sometimes take shortcuts that can open up security vulnerabilities and result in breaches. And with the current work-from-home environment, it's not uncommon for developers to transfer copies of the code they are working on to their laptop, which may not have the right protections installed.

## **The Solution: Developer Workspaces**

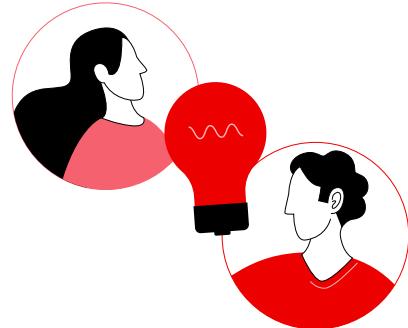
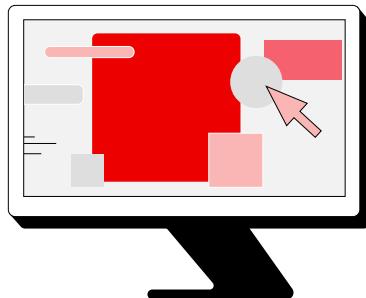
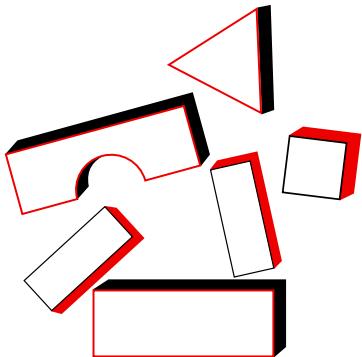
One way to address all of these issues is by creating a developer workspace and cloud-based IDE built for containerized development environments. In the world of browser-based IDEs, workspaces store source code along with everything necessary to edit, build, run and debug code. Each workspace has its own private IDE hosted within it.

This solution addresses head-on the issue of quickly onboarding developers to new projects. With the workspace approach, adding a new developer to an environment is as easy as creating a new workspace, which can be done by simply identifying the type of workspace required, ideally through vendor-provided templates. That process spins up everything the developer will need — all of the tools, dependencies and other resources.

Ensuring consistency and collaboration for everything from frameworks and runtimes to libraries and software versions is a constant struggle in DevOps, but it's critical. "There can be real implications if one developer is using the wrong version," Dudash said. To avoid these issues, choose a development platform that enforces version control and enables all developers to work and collaborate on projects via shareable links.

Security is always top of mind with DevOps environments. One way a good browser-based IDE can address this is by allowing team leaders to specify only the tools and resources developers can use in the workspace. If they attempt to use anything else, the workspace will reject it. As an added security measure, look for a workspace that doesn't allow developers to save code on their own devices.

# Best Practices for Developer Workspaces



## Failure is an option.

When it comes to DevOps, it's OK to fail. In fact, the goal of failure is to identify what's not working and fix it before it's in a production setting. It's important to ensure that your process has safeguards that catch errors as early as possible. The best way to do that is by choosing a browser-based IDE that has a secure pipeline. "Knowing that your production systems have processes in place to catch errors gives developers more confidence that they can release software frequently," said Chris Kang, a Staff Solutions Architect at Red Hat.

## Choose a browser-based IDE that has everything you need.

The platform you choose should be able to create all of the containers you need to run the project and clone sources where needed. It should also provide development tools such as debuggers, language servers, unit test tools and build tools so the running application container continually mirrors production. "Developers need specific testing tools and compilers to ensure code quality, but you don't want to release those tools into what you're putting into production because they bloat up the production image and potentially create security breach holes," Dudash said.

## DevOps is about more than tech.

Technology is central to good DevOps, but true success means also addressing people and processes. That means sharing practices and outcomes, supporting innovation and agility, and fostering a culture of trust. And it's not easy for many organizations; one recent survey found that 85% have faced barriers in successful DevOps, and adjusting corporate culture was a top complaint. Another survey found general organizational resistance to change and an organizational culture at odds with Agile values. The first step to overcoming these barriers is changing the way teams are structured and improving collaboration, Kang said. "For example, it's not uncommon to find that different teams don't interact often, but that won't work in a DevOps world," he said. "Instead, focus on developing more cross-functional teams where the operations, development, security and product members collaborate."

*"DevOps may well become seen as central to cloud computing adoption. If everything is a virtualized cloud service, automating the orchestration of cloud services delivery – essentially, DevOps – is a no-brainer."*



# Use Case: Browser-Based IDE: A Worthy Successor to VDI

Traditionally, application developers have worked in an office, often in the same physical area as others on the team. That's less common today, with so many people working from home. That means that developers don't have access to the resources in their agency office, including their IDE. Instead, they may be working on laptops functioning as virtual desktop infrastructure (VDI) stations, accessing the data from their office computer through painfully slow virtual-private network connections. The speed component can be very frustrating, and often depends on the network connection.

Besides speed issues, there are problems with the efficiency of the VDI approach for developers. In essence, a developer's IDE lives on the computer in the office. With VDI, developers are essentially receiving a remote picture of that IDE screen, requiring them to use their local keyboard and mouse to perform functions.

Realizing these shortcomings, some enterprising organizations are providing application developers working from home with a better solution: a browser-based IDE, securely accessible from a home computer or laptop. Because the IDE is accessible via a browser, developers can use any secure device to access it. That means developers have full access to their technology stack. They can even run multiple workspaces and preview their work in a develop environment or separate tab. This method is also inherently secure, because the code does not exist on the developer's machine.

Because of these security features, this method also allows developers in different locations to securely share a single workspace.

## HOW RED HAT HELPS

Red Hat has a long history of helping agencies meet changing demands quickly and efficiently. Its open source approach to everything from cloud-native development to digital transformation and optimization have helped countless agencies meet and exceed their goals. To ensure compatibility, Red Hat has worked to achieve important certifications, including Common Criteria, Federal Information Processing Standard 140-2, the Federal Information Security Management Act, the Federal Risk and Authorization Management Program and many more.

Red Hat CodeReady Workspaces allows agencies to get more out of DevOps. It uses Kubernetes and containers to provide developers with consistent, preconfigured development environments. Although each team member has access to their own workspace instance, all developers share the same runtime environment and libraries. This cloud-native, secure and shareable developer workspace allows all team members to work collaboratively without worrying about inconsistencies.

**Learn more:** [www.redhat.com/government](http://www.redhat.com/government)

# Conclusion

---

Federal agencies are embracing DevOps for its abilities to speed software development, foster innovation, and improve quality and reliability. But a DevOps approach in and of itself does not guarantee a smooth process. Agencies need to ensure that their development teams are set up for success — for example, that they can onboard new developers quickly, collaborate effectively and work securely.

By deploying a developer workspace and cloud-based IDE, agencies can transition to cloud-native development while also reducing operational complexity that new development patterns have introduced.



## ABOUT RED HAT

---

The adoption of open principles helps the U.S. government start, accelerate, and improve the art of digital transformation—people, process, and technology. As the world's leading provider of enterprise open source solutions, Red Hat uses a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers integrate new and existing IT applications, develop cloud-native applications, standardize on our industry-leading operating system, and automate, secure, and manage complex environments. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500 and 100% of U.S. executive departments. As a strategic partner to cloud providers, systems integrators, application vendors, customers, and open source communities, Red Hat can help organizations prepare for the digital future.

[www.redhat.com/government](http://www.redhat.com/government)



## ABOUT GOVLOOP

---

GovLoop's mission is to “connect government to improve government.” We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

For more information about this report, please reach out to [info@govloop.com](mailto:info@govloop.com).



1152 15th St. NW Suite 800  
Washington, DC 20005

P: (202) 407-7421 | F: (202) 407-7501

[www.govloop.com](http://www.govloop.com)  
@GovLoop