<WEBAPPER>
cloud application engineers

webapper.com

SUCCEEDING WITH DEVOPS & CLOUD MIGRATION

You may have seen a phrase popping up in software discussions: modern application development. Technology leaders like Amazon and Microsoft have been touting it for some time. If you perform a web search, you'll find numerous corporate ads and blog posts around it. Simply stated, it's a revolution that's been brewing for years, and if you haven't embraced it yet, please continue reading...

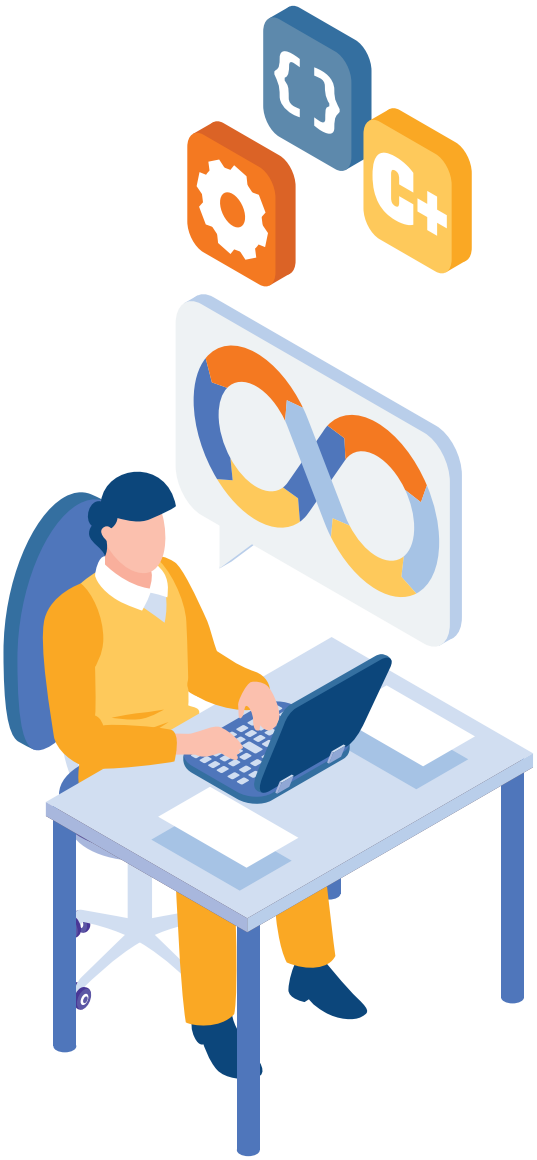
Two key ingredients in modern application development are DevOps and cloud computing. If you do a deep dive into any of the unicorn software as a service (SaaS) products or the technology of many household brand companies, you'd find they are fully immersed in both.

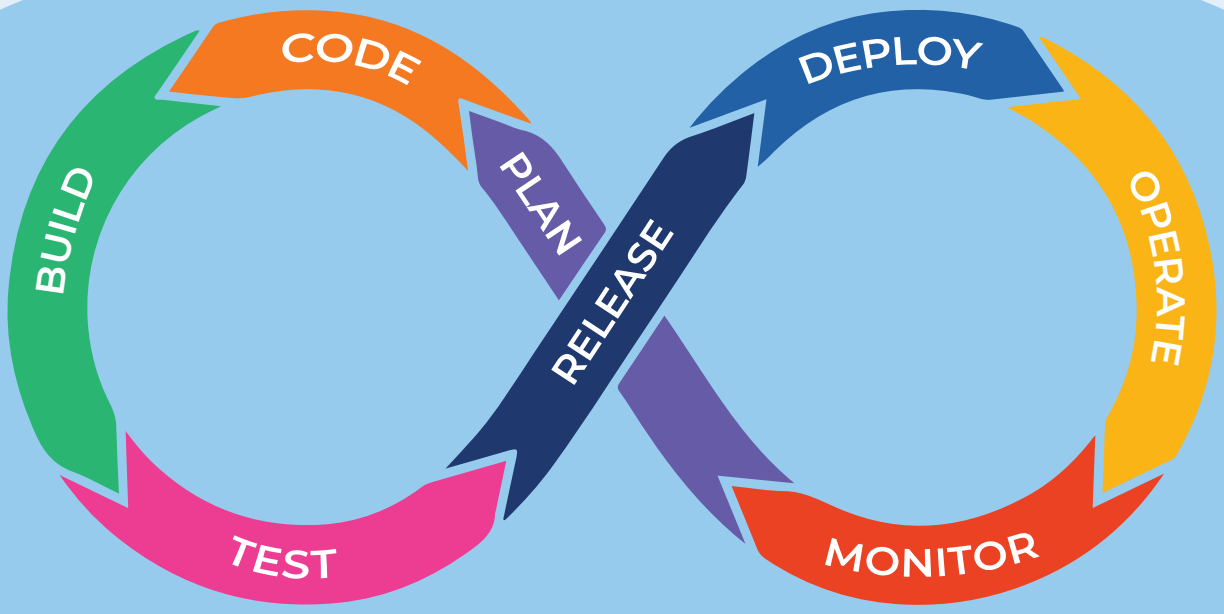
DevOps and cloud computing represent a cultural shift from the IT strategies of yesteryear.

WHAT IS DEVOPS?

DevOps combines software development and IT operations to shorten development cycles, provide continuous delivery, and deliver high software quality. DevOps means Development plus Operations, a collaboration between development and operations.

DevOps optimizes building and deploying software code, reducing deployment times from days to minutes. It entails building a culture where individuals, teams, and the organization focus on streamlining communication, standardizing environments, and automating processes. The most successful DevOps implementations bridge gaps between the business, development teams, operations, and infrastructure.





DEVOPS PRACTICES

Continuous Integration

Developers regularly merge code changes into a central repository, then automated builds and tests are run.

Continuous Delivery

Code changes are automatically built, tested, and prepared for release to production, then deployed to a testing and/or production environment..

Microservices

Developers build a single application as a set of small services, each communicating with other services through a well-defined interface.

Infrastructure as Code

Infrastructure is provisioned and managed using code and software development techniques

Monitoring and Logging

Organizations monitor logs & performance metrics to see how application and infrastructure impacts user experience.

Communication and Collaboration

Teams establish strong cultural practices for information sharing and communication.

SUCCESSFUL DEVOPS PROJECTS

Nordstrom

Fashion retailer Nordstrom began experimenting with DevOps over a decade ago. After seeing many category-leading businesses perish at the hands of more nimble technology-based startups, the IT department experimented with several initiatives where things weren't working – those projects were more receptive to outside-the-box thinking. Nordstrom's mobile app, which initially launched with numerous bugs and poor user experience, quickly emerged as a shining example of the possibilities of DevOps within the company. The team was reorganized to facilitate shorter, frequent releases to address customer feedback. Within a year, they doubled output of new feature releases while cutting defect reports in half. As a result, upper management increasingly supported the approach, helping ensure Nordstrom would remain a viable player in fashion ecommerce.

Netflix

Netflix is renowned for its unique approach to DevOps. Their journey to cloud computing and DevOps began after their worst outage in 2008, caused by a database corruption in 2008. At the time, Netflix was in the business of shipping DVDs to their members, and the outage impacted a third of their users. Netflix decided to move to the cloud and rearchitect their infrastructure using AWS. Rather than "lift & shift", Netflix opted to rewrite their application as cloud-native. Netflix migrated a monolithic, data center-based application to a cloud-based microservices architecture. Taking things a step further, engineers wanted to to make Netflix's cloud infrastructure more reliable and secure, avoiding more outages. Netflix created a system called Chaos Monkey that uses continuous automated tests to verify Netflix's ability to survive unexpected outages without impacting users. Today, Netflix has hundreds of microservices, thousands of daily production changes,and over 10,000 virtual instances within AWS, all serving over 200 million subscribers worldwide.

Capital One

In banking, Capital One has a reputation for embracing technology. For the past 10 years, Capital One has seen itself as a digital technology company. To facilitate innovation, Capital One created a developer culture to attract & retain better engineers. DevOps is critical to that developer culture. They have embraced automation, monitoring, and continuous integration to drive rapid development cycles and more frequent releases. They constantly collect customer feedback and iterate to embrace customers' ideas that deliver a better experience. Capital One relies on a number of AWS cloud services to respond to customer insights. DevOps teams use these building blocks to develop new products quickly.

Amazon

Arguably the most noteworthy cloud company and DevOps practitioner is Amazon. With its roots in selling books and CDs in the '90s, Amazon became "earth's biggest bookstore". They embraced the cloud early on. Amazon's seasonal holiday crush necessitated resilience, which drove the need for burstable cloud infrastructure. Amazon moved to Amazon Web Services (AWS) cloud, enabling engineers to scale when needed. The company's expansion from books to diverse product categories required decentralization of teams, and that drove Amazon's adoption of DevOps. The obvious analogy is that Amazon, an insanely busy ecommerce "jet", rebuilt itself while in flight. The company transitioned to continuous deployment processes that enabled development teams in those diverse product areas to deploy their code. Speed of deployment with better uptime & performance led to a better custom experience and more revenue.

DEVOPS
THE NUMBERS TELL A STORY

DevOps Market Size

- Over $7 billion in 2021.
- Estimated CAGR growth of over 20% from 2022 to 2028.

What Do IT Decision Makers Say?

- Traditional Ops are over 40% more time-consuming.
- DevOps spends over 30% more time on infrastructure improvements.
- DevOps spends 60% less time handling support cases.
- 83% reported implementing DevOps practices to unlock higher business value.
- 99% say DevOps has had a positive impact on their organization.
- 61% say implementing DevOps helped produce higher quality deliverables.
- Almost 50% of companies report a reduction in time-to-market software and services.
- Over 60% of DevOps organizations release new software more frequently.
- Over 50% of DevOps managers report improved cooperation and collaboration.

ADVANTAGES OF DEVOPS

Improve frequency of your deployments.

Be more nimble and innovative to address your customers' needs.

Reduce time to market for your projects.

Develop efficiencies so team members are less stressed and deliver better results.

Reduce lead time between fixes.

Fix any mistakes quickly to deliver a better customer experience.

Increase the overall performance of your teams.

Hire leading edge developers and help them thrive.

BUILDING YOUR PIPELINE

Standardize Processes for Easy Replication & Fast Delivery

DevOps uses systematic and organized processes for replication and delivery. Standardizing your process saves time and increases efficiency.

Employ Cloud Automation

Replace manual processes in cloud environments with automated processes using tools. For example, infrastructure as code (IaC) can configure servers or set up a network. Cloud automation enables you to leverage resources and to avoid mistakes of manual, error-prone workflows. Cloud automation should be a central component of your overall DevOps strategy. Automated deployment processes...

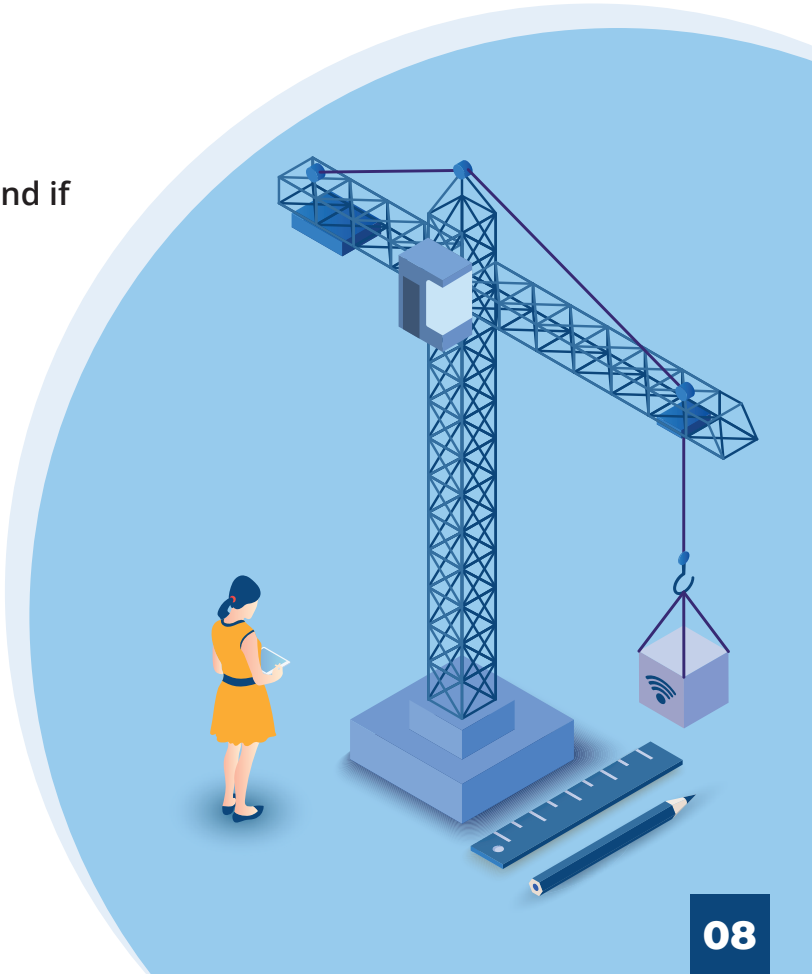
- Use environment-specific configuration information.
- Use packages for continuous integration (CI) processes deployable to any environment.
- Use scripts to configure the environment, deploy packages, and perform tests.

Don't Automate Bad Processes!

Identify, document, review, and refine your current manual processes to ensure the right activities are automated. Keep things simple, and if possible, eliminate organizational silos.

Document & Measure

DevOps teams should value documentation and metrics – they are essential for long term success. DevOps and cloud automation quickly become mission-critical. Don't forget to document your DevOps pipeline. You want repeatable, debuggable workflows (and they're never "done" – you'll iterate!). Measurement helps you know when your system is working.



BEST PRACTICES WITH DEVOPS

Think Pareto Principle

An incremental approach to automation is always a good idea. When transitioning to automated integration & deployment processes, you may find it hard to decide what to automate first. Consider automating the build process first. Then you may want to automate your unit testing to reduce the impact on developers. Start simple, but prioritize what you do next based on impact on the development team.

Measure and Monitor

Many DevOps tools will help track your progress. How many times are we building each day (compared with a prior day)? Is deployment faster than it was last month? Should we rollback the latest deployment? Determine your success metrics, measure them, and monitor them regularly. As you automate more, adapt your measurements.

Emphasize Security

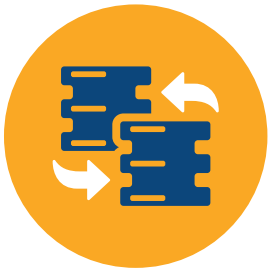
As we have learned from recent cyber threats, DevOps represents some of the most critical infrastructure to protect. First, we need to isolate and secure CI/CD environments, deploying them to internal, protected networks, unexposed to the outside. And perhaps you've heard of DevSecOps, which considers application & infrastructure security from the start. DevSecOps automates security to keep the DevOps workflow moving quickly. allowing the least privilege possible to minimize unauthorized connections and access

Fail Early, Fail Often

We firmly believe in “shift left” testing, running more tests locally even before committing code to the DevOps & CI/CD pipeline. That is, integrating unit tests in your CI pipeline allows code to fail early in the process and avoid more expensive fails later in the pipeline, or even worse production problems. Ideally, you work in smaller update batches, release more frequently, and learn from defects before (& after...) they get into production.

Continuously Automate the Delivery Lifecycle

Evaluate your processes and automated and integrated tests in your pipeline regularly. Needs change, things break, systems evolve. Follow your metrics and use them to iterate.



Prepare a Rollback Strategy

Develop a release strategy that fits your process to reduce risky deployments. You need a release AND rollback strategy. When you release software, you can introduce software bugs or delivery problems.

DEVOPS & CI/CD TOOLS

With a variety of tools, languages, and platforms, organizations need tools to integrate and validate changes. DevOps delivers a consistent, automated method of building, packaging, and testing applications. Development teams who implement continuous integration typically start by setting up version control and sharing best practices. Then the build process can be automated, packaging the software, database, and components. Next, automated testing enables building and automating tests that can help development teams know if the latest software build passes or fails. Listing and explaining all the choices for DevOps & CI/CD tools would be exhaustive, so we'll explain the basics and list some of the most popular options.

TOOLS FOR MANAGING SOURCE CODE

Whether you're a solo developer or a team collaborating on a complex software project, source code control is essential.

Github

Git, one of the best and most popular version control tools available, provides a developer-focused environment.

Bitbucket

BitBucket by Atlassian — known for its collaborative development products JIRA and Confluence — includes features like pull requests, code branches, and in-line commenting.

Gitlab

GitLab is a web-based Git repository manager that includes project wiki and issue tracking. GitLab's continuous integration capabilities automate testing and delivery.

SVN

Apache Subversion aims to be a best-matched successor to the widely used CVS tool.

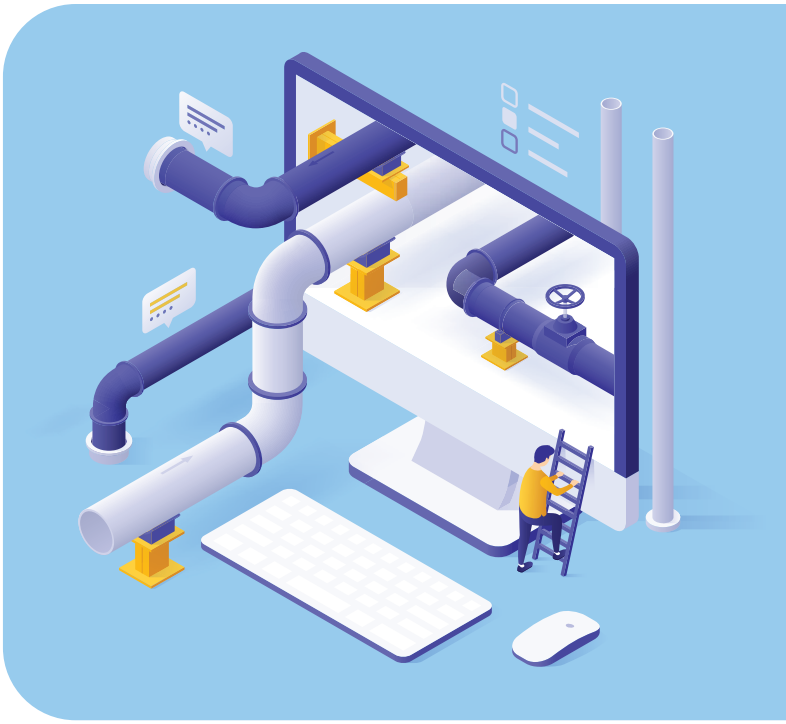
Source Control with AWS

AWS CodeCommit hosts Git repositories and works with all Git-based tools. This option is helpful if you're using other AWS products. You can use CodeCommit with your current Git tools, but your code will be hosted in the secure AWS environment.

TOOLS FOR CONTINUOUS DELIVERY

AND CONTINUOUS DEPLOYMENT

A sophisticated DevOps pipeline pulls code from version control, performs the build, establishes needed cloud infrastructure, moves code and components to the target environment, manages switching of services, runs deployment tests, and reports results. It may also synchronize data, archiving resources, and apply patches. CD reflects the embrace of agile processes in application development.



Jenkins

Jenkins is an open-source DevOps testing tool that can automate building, testing, and deployment. It allows developers to find and solve defects in their code quickly and then automate build testing.

CircleCI

CircleCI is a continuous integration and delivery platform that can be installed locally or used in the cloud. It simplifies automated testing, building and deployment with its simple user interface.

Selenium

Selenium is automated software testing's closest thing to a household name. It's an open-source framework well-suited for teams that adopt continuous testing.

Appium

Appium is a popular solution similar to Selenium but built specifically to test mobile apps.

Katalon Studio

Built on Selenium and Appium, Katalon Studio is a comprehensive continuous testing solution that addresses test automation in CI/CD and DevOps.

Bamboo

Atlassian's Bamboo is a server-based, "drag and drop" CI and deployment tool that allows building new branches automatically and merging them after testing. Bamboo works best with BitBucket and Jira for complete traceability from original planning to final delivery.

AWS CodeDeploy

CodeDeploy is a fully managed software deployment service for Amazon computing services like AWS Lambda, Amazon EC2, and AWS Fargate. It facilitates automated deployments, QA tracking, and more.

RECOMMENDED DEVOPS READING

Hopefully we've lit the fuse on your interest in DevOps. Check out these magnificent resources on your journey to DevOps.

The Phoenix Project

A fun read, The Phoenix Project is a fable about an organization that suffers from chaos and adopts DevOps. Gene Kim, Kevin Behr, and George Spafford – 3 icons of the DevOps movement – tell a story that everyone who works in IT will recognize. We've seen these people time and time again!

DevOps Handbook

Gene Kim, Jez Humble, Patrick Debois, John Willis, and Nicole Forsgren wrote this must-read guide for organizations scaling up IT and expanding DevOps practices. The DevOps Handbook is the definitive guide for applying the lessons of The Phoenix Project.

Puppet State of DevOps Report

For the past decade, nearly 40,000 technical professionals from around the world have contributed to The State of DevOps body of research. Surveys and studies show how the industry is changing year to year.

Effective DevOps

Recommended by a trusted colleague years ago, Effective DevOps illustrates why DevOps is a cultural movement, demanding change from inside your organization. Authors Ryn Daniels and Jennifer Davis outline approaches for improving collaboration within teams, promoting efficient tool usage, and scaling up what

Leading the Transformation

Written for executives, this guide provides a framework for improving development and delivery. It targets coordination of work across teams in large organizations - an improvement that executives are uniquely positioned to lead.

WEBAPPER BRINGS EXPERIENCE &

INSIGHT TO CLOUD DEVELOPMENT & HOSTING.

Our comprehensive application development process means you get solutions that work, scale, and thrive. When you need additional development resources, it can be more efficient to use an outsourced development team. We've designed our application development service specifically for businesses like yours. You'll work with a dedicated team of development professionals who are experts in product development.

Product Mindset

We have already built products that delight users around the world.

Innovative Thinking

We drive digital innovation with design thinking, rapid prototyping, and iterative development.

Exceptional Talent

Our team can capture your product ideas and build the best possible product for you.

Broad Technology Expertise

We bring full-stack expertise to every system we design and develop.

Cost Effective

Save valuable time and money by outsourcing. Scale your team to meet changing needs.

LET'S TALK.

GET A FREE CLOUD SERVICES CONSULTATION

Call (970) 670-0169 or visit webapper.com today.