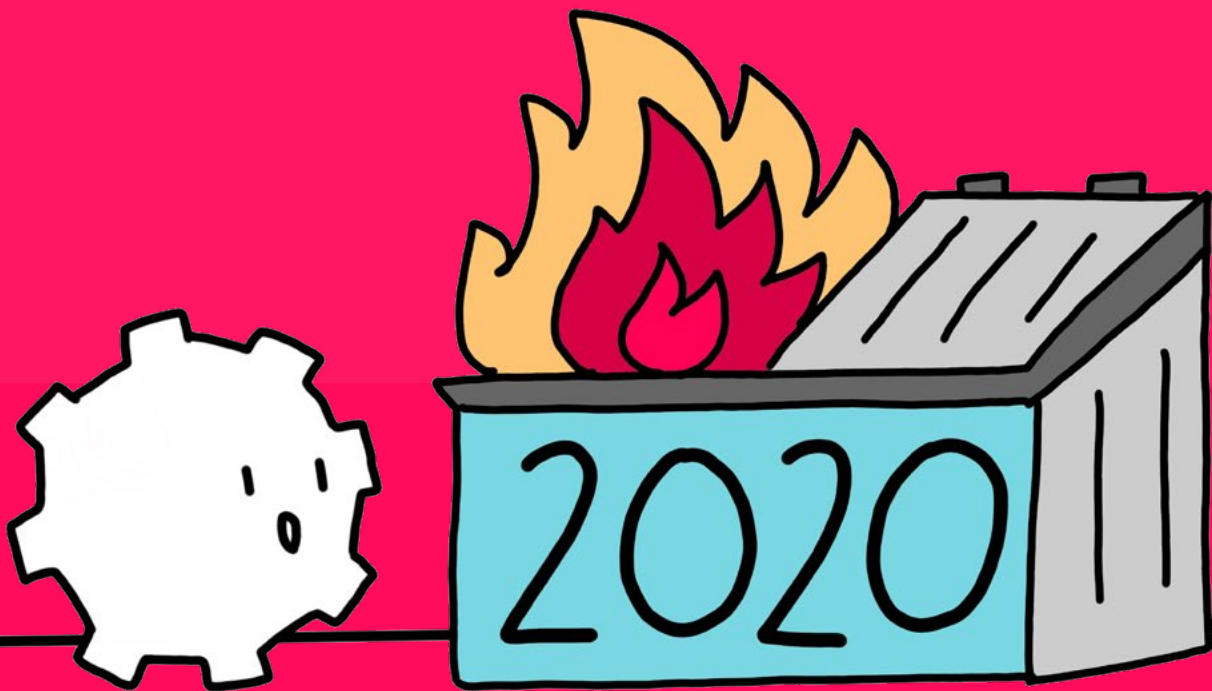# DEVOPS IN DOODLES

ASHTON RODENHISER

CHRIS TOZZI

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DevOps in Doodles 2020: A Year in Review

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DEVOPS IN DOODLES 2020:
A YEAR IN REVIEW

2020: Whether you loved it or hated it, there's no denying that it was a heck of a year. While many folks may have good reasons to be glad the year is over, there is at least one positive way of looking back over the events of the past twelve months: Through the lens of DevOps.

From the perspective of the DevOps community, in other words, a lot of good things actually managed to happen in 2020.

2020 saw the explosion in popularity of new DevOps trends and technologies, like AIOps and chaos engineering. It also brought us a range of important corporate acquisitions, as well as new approaches to building cloud architectures and deploying applications. Perhaps most interesting of all, DevOps took on something of a political flavor as companies and communities sought to apply lessons on social justice to their platforms.

To be sure, 2020 had its downsides for the DevOps world, too. Outages continued to happen, even at the largest DevOps service providers. Security incidents with popular DevOps platforms like Docker and Kubernetes remained a challenge, too.

However you choose to think about all of these changes, it's clear that the DevOps world ended 2020 in a markedly different place than where it began the year.

If you want to take stock of it all, this guide's for you. In words and doodles, the following pages walk through everything you need to know about DevOps in 2020 — the good, the bad and the mundane.

KEY DEVOPS TRENDS AND THEMES IN 2020

Let's start by discussing the key technological and cultural trends that shaped DevOps in 2020. Although DevOps was already a well-established discipline at the start of the year, the past twelve months witnessed the emergence or solidification of several key new trends and themes that are helping to advance DevOps concepts.

Observability Gained Focus
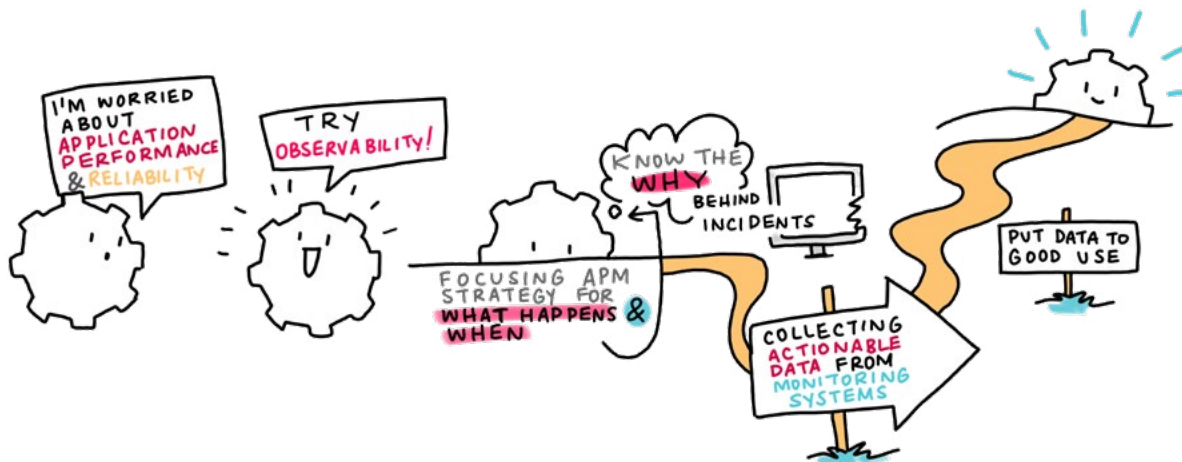
In the days of yore, DevOps teams and SREs talked incessantly about APM -- which, depending on whom you asked, was short for either Application Performance Management or Application Performance Monitoring.

APM is still alive and well. Over the course of 2020, however, DevOps practitioners who are concerned with application performance and reliability gained a new term to know and love: Observability.

Although you can still find somewhat different definitions of the term out there, observability generally refers to the idea of focusing your APM strategy not just on monitoring for what happens and when, but also to understand "the why" behind performance and reliability incidents. Put another way, observability aims to bring a greater level of contextualization to application performance management and monitoring.
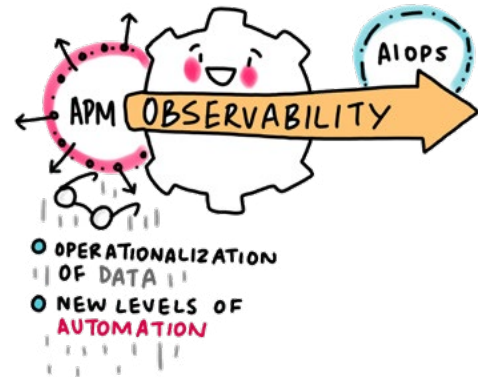
Going forward, then, the APM conversation is likely to center around collecting actionable data from monitoring systems, and being sure that you put the data to good use in the real world. Gone are the days of monitoring just for monitoring's sake.

AIOps Became Real

AIOps, which refers to the idea of using AI and machine learning to help automate IT operations, has been a buzzword since Gartner coined the term in 2016. Early on, it wasn't a clear bet that AIOps would ever amount to anything more than a buzzword or vaporware.
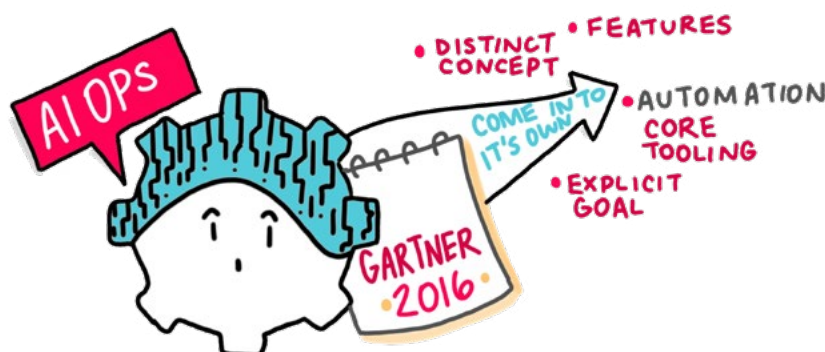
But 2021 suggests that it will. Increasingly, vendors like Splunk and AppDynamics are making AIOps-style automation a core part of their tooling.
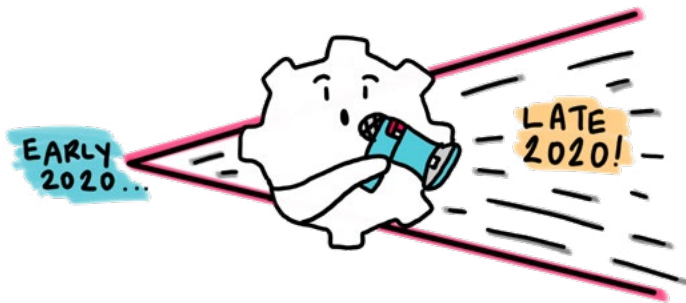
You could argue that, in some cases, these vendors were offering AI-driven features before they started calling them AIOps. That may be true to some extent.

Still, we think that what changed over the course of 2020 was that AIOps came into its own. It's now a distinct concept and an explicit goal for tool vendors, rather than just something that they might implement in the course of trying to develop interesting new features. We think there will be much more AIOps — and that AIOps will become even more real — in the near future.

Chaos Engineering

Like AIOps, chaos engineering is a concept that has been around for a while. It centers on the idea that by experimenting with production systems, you can optimize their performance and reliability. It's the opposite, in a sense, of focusing on pre-production testing as the key to building stability.

Although chaos engineering wasn't a novel idea in 2020, the events of the year helped bring it into sharper focus. The sudden rush to retool IT systems and infrastructure to support remote workers in response to the pandemic, without the luxury of being able to test out new remote solutions before they were deployed, gave many DevOps teams a baptism by fire in the merits of chaos engineering.

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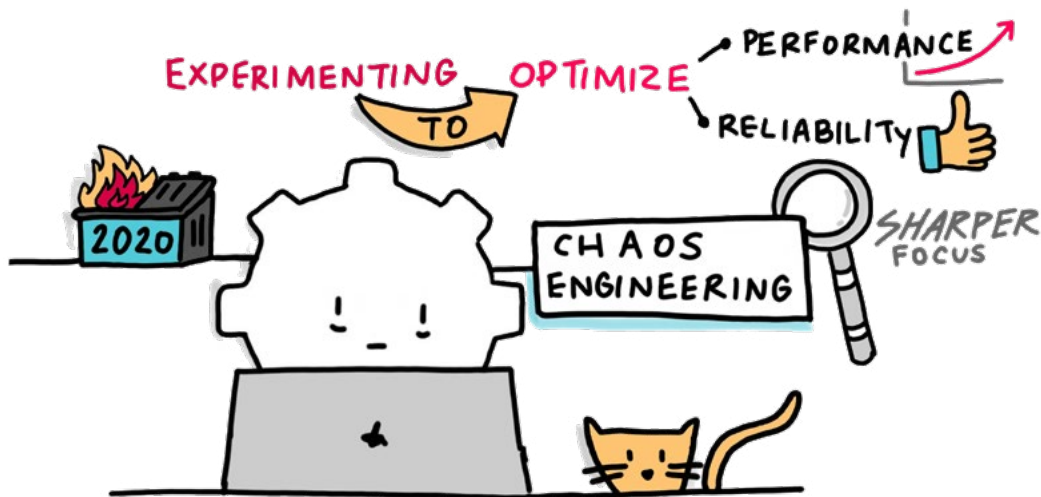
Cloud Repatriation

The mantra of the 2010s was "move to the cloud." Now, as we enter a new decade, DevOps teams are increasingly likely to think in the opposite direction by considering cloud repatriation, which means migrating cloud-based workloads (at least in part) back on-premises. Indeed, as many as 27 percent of organizations report cloud repatriation plans. The economic uncertainty of 2020, and the cost pressures it brought, only accelerated cloud repatriation plans.
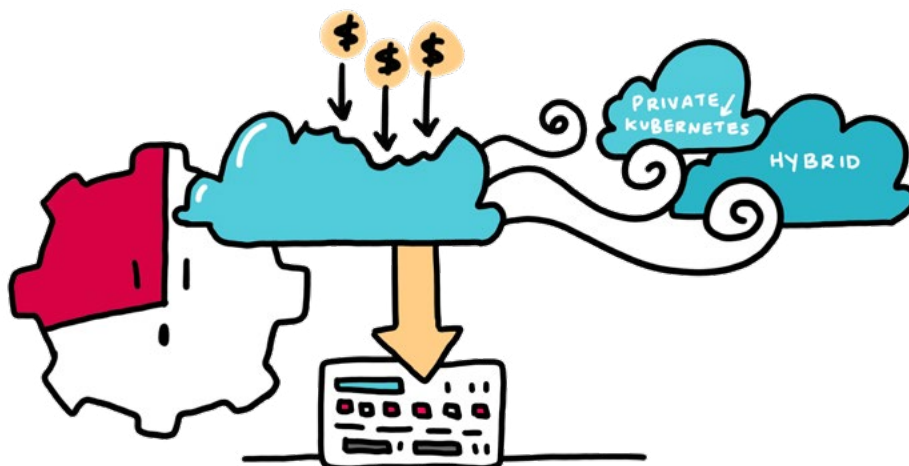
The important thing to keep in mind as cloud repatriation trends is that it's not merely a retreat. In many cases, cloud repatriation is about moving from a strategy powered by basic public cloud IaaS services to a more sophisticated one – such as a private cloud driven by Kubernetes, or a hybrid cloud that seamlessly integrates public cloud services with on-premises infrastructure.

What this means for DevOps teams is that cloud architectures are likely to grow even more complex and fluid in the years to come. It will not at all be enough to master a single cloud or a single deployment platform.

Hybrid Cloud

Along similar lines, 2020 saw the maturation of a new generation of hybrid cloud solutions from the public cloud vendors – Google Anthos, Azure Stack, AWS Outposts and Oracle's Cloud@Customer.
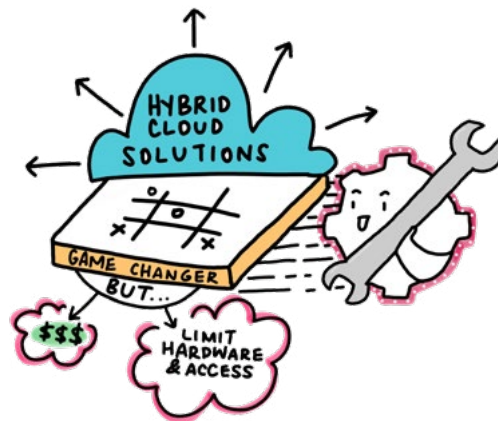
Most of these solutions existed before 2020, but the past year saw many of them reach general-availability status and more wide-spread adoption. For the DevOps ecosystem, these solutions are a game-changer because they make it possible to use a truly integrated, singular set of tooling to deploy and manage workloads that span public and private infrastructure.

They are putting an end to the days when hybrid cloud meant "we use public cloud and private cloud at the same time," and replacing them with a world where public and private clouds blend seamlessly together.

These platforms do have some drawbacks. They are not cheap. Most of them limit which hardware you can use (Outposts even requires you to buy servers directly from Amazon). They offer access to only a subset of cloud services. Thus, they're not for everyone.

But for organizations that had the capital, 2020 was the year when it finally became practical to build a truly integrated hybrid cloud – not just run OpenStack on some servers while also using AWS and calling it a hybrid cloud.

Social Justice Meets DevOps

It's frequently said that DevOps is all about culture. The DevOps community proved that point this year by engaging with cultural discussions around not just software delivery, but also social justice.

GitHub said goodbye to linguistic constructions like "master" and "slave." Meanwhile, a variety of tech companies took pains to express their solidarity with Black Lives Matter protesters. And broadly, companies faced increased pressure to move away from "black box monitoring" strategies by becoming more transparent with regard to data collection and user tracking. Compliance frameworks like the GDPR, which took effect in 2018, have already been pushing organizations in this direction, but the social justice momentum of 2020 added a new imperative for transparency.

> **2020 WAS THE YEAR WHEN IT FINALLY BECAME PRACTICAL TO BUILD A TRULY INTEGRATED HYBRID CLOUD**

> **2020 WAS A WATERSHED MOMENT FOR THE WILLINGNESS OF THE DEVOPS COMMUNITY TO ENGAGE IN REAL-WORLD POLITICAL DEBATES.**

There's a long conversation to be had about the extent to which these sorts of efforts help to effect real-world change, or whether they are mere "virtue signaling." But whatever you think, it's hard to deny that 2020 was a watershed moment for the willingness of the DevOps community to engage in real-world political debates.

While DevOps technology and culture were busy evolving, DevOps companies were busy buying each other or going public. Major movements included:

VMWare buys SaltStack: Not content to let public cloud vendors and open source companies like Chef dominate the Infrastructure as Code (IaC) space, VMware announced intent to acquire SaltStack in September 2020.

Splunk buys Plumbr and Rigor: Splunk bolstered its observability chops by acquiring Plumbr, an Application Performance Management (APM) and real-user monitoring vendor. They also announced plans to buy Rigor, which focuses on synthetic and digital-experience monitoring. Remember when Splunk was basically a cool way to aggregate log data? Those days are long gone.

DataDog buys Undefined Labs: DataDog, a monitoring and APM vendor, made a move similar to Splunk's by purchasing Undefined Labs, which adds developer testing and observability to DataDog's portfolio.

JFrog: JFrog, which specializes in the relatively narrow niche of artifact management, went public.

Sumo Logic: Sumo Logic, which likewise specializes in a relatively specialized niche – log management, in Sumo's case – made an IPO of its own.

SUSE buys Rancher: SUSE revamped its container strategy by purchasing Rancher, one of the first major startups to focus on containers, and later, Kubernetes.

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> ## DEVOPS COMPANIES WERE BUSY BUYING
> ## EACH OTHER OR GOING PUBLIC
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IBM buys Instana: One of the APM world's newest companies joined one of the oldest software companies when IBM announced plans to acquire Instana, which was founded in 2015. The move adds new AI-driven application monitoring technology to Big Blue's growing portfolio of DevOps technology.

All of the above are signs of further consolidation in the DevOps space as larger companies buy smaller ones and smaller ones grow larger (and, in some cases, buy smaller ones – as Sumo Logic did in late 2019, when it bought JASK).

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SIGNS OF FURTHER CONSOLIDATION IN THE DEVOPS SPACE

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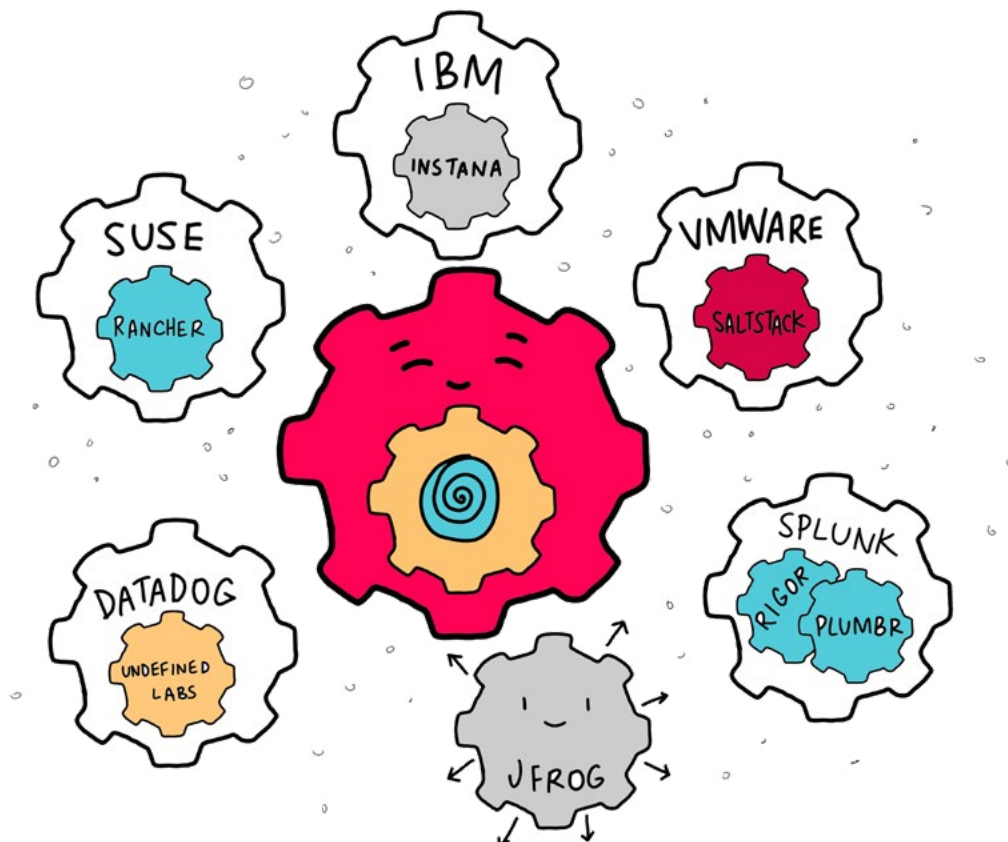
PROBLEMS AND CHALLENGES

Alas, although the world of DevOps may have fared better in 2020 than did the world writ large, even DevOps had its setbacks.

Some setbacks occurred, predictably, in the realm of security. The DevOps community remains much better at delivering software quickly and continuously than it does at delivering it securely. That flaw continued to show in 2020 through relatively serious security vulnerabilities in technologies like Kubernetes and Docker.

Along similar lines, the major public clouds – including AWS, Google and Azure – experienced their share of outages or near-outages due to security incidents or other problems. This is all to be expected, but it's a reminder nonetheless that almost nothing in life is guaranteed – not even a public cloud service with 11 9s of reliability.

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> ## THE DEVOPS COMMUNITY REMAINS MUCH BETTER AT DELIVERING SOFTWARE QUICKLY AND CONTINUOUSLY THAN IT DOES AT DELIVERING IT SECURELY.
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DevOps critics might argue, too, that despite the many good things that happened in DevOps in 2020, there remains disconnect between DevOps in theory and DevOps in practice. It's easy to talk about DevOps – and, for that matter, DevSecOps, QAOps, NetOps, NoOps and whatever other kinds of *Ops float your boat – but translating DevOps precepts into on-the-ground realities can be challenging.

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That's a fact reflected in part by data showing that, although many companies are making progress toward embracing DevOps, large numbers of organizations – especially those that are not technology elites, like Netflix or Google – have made only halting steps toward full adoption of DevOps practices.

> **" DESPITE THE MANY GOOD THINGS THAT HAPPENED IN DEVOPS IN 2020, THERE REMAINS DISCONNECT BETWEEN DEVOPS IN THEORY AND DEVOPS IN PRACTICE "**
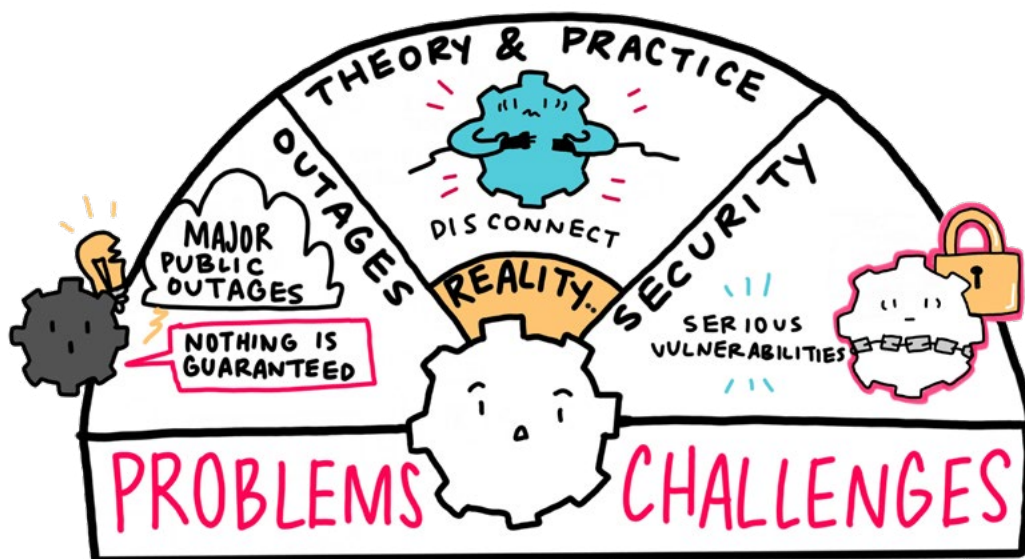
So, what does it all mean? Where does the DevOps ecosystem stand at the end of 2020?

We can't answer those questions to everyone's content. But we can tell you what we think are the overarching takeaways from DevOps in 2020.

Cloud Strategies Remain in Flux

Despite the fact that we're now a solid fifteen years or so into the age of the cloud – and maybe even longer, depending on how you choose to think about it – cloud architectures continue to shift and evolve.

First everyone was in a frenzy to move to public cloud. Then, circa 2017, multi-cloud became the thing to do. Today, they're repatriating and refactoring their cloud environments; in part, by taking advantage of new hybrid cloud frameworks like Anthos and Azure Stack.

We don't know where the cloud journey will end for most DevOps teams. But we can tell you that it's still very much in progress, and no matter how much you think you've settled on a cloud strategy for your organization, you probably need to think again.

Security Remains a Challenge

We said it before, and we'll say it again: DevOps remains much better at software delivery velocity than it does at software security.

Maybe that's due in part to the enormous pressures that DevOps teams face to deliver early and to deliver continuously. But it probably also reflects the ever-increasing complexity of modern environments.

It was one thing to secure the handful of VMs running in your data center a decade ago. It's quite another to secure your VMs, the containers they host, the container runtime powering those containers, the Kubernetes engine that orchestrates them and everything else you have running in a modern environment.

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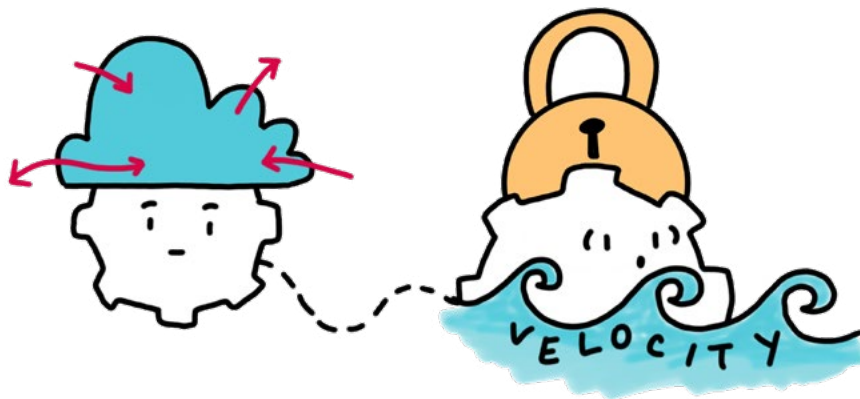
When you deploy to multiple clouds or to a hybrid cloud, and have to juggle multiple management tools, life becomes even trickier for a security-minded DevOps engineer.

We don't know how to fix DevOps's security challenges. But we do know they'll remain challenges for a long time to come.

APM is Being Overhauled

APM is not at all new. In fact, going into the year, APM seemed almost boring. It conjured images of Nagios dashboards and Grafana graphs that, while slick-looking, were not really high on the list of any DevOps engineer's most beloved software assets.

Today, however, APM is in the midst of an overhaul. The reorientation of APM toward observability is part of this. So is the next-generation tooling that comes with AIOps. And the efforts by conventional monitoring vendors to expand their portfolios to address every aspect of visibility and observability, means that the APM platforms of the future are likely to be more expansive than ever.

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> **APM IS IN THE MIDST OF AN OVERHAUL. THE REORIENTATION OF APM TOWARD OBSERVABILITY IS PART OF THIS. SO IS THE NEXT-GENERATION TOOLING THAT COMES WITH AIOPS**
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Monitoring dashboards are not going away. Going forward, however, APM will evolve into more than just a recitation of metrics and log data. It will focus on the operationalization of data, coupled with profound new levels of automation.

DevOps Market Consolidation Accelerates

The purchase of smaller DevOps companies by larger enterprises wasn't a new trend in 2020: Witness, for example, IBM's Red Hat acquisition all the way back in 2018; or the Microsoft-GitHub marriage in the same year.

However, the swatch of acquisitions and IPOs by DevOps companies in 2020 suggests that market consolidation is continuing. The DevOps space will increasingly be dominated by a smaller number of companies that, individually, control a larger share of the market.

That said, we don't think the DevOps market will become a monolithic space anytime soon. There will always be DevOps startups, and there will always be legacy enterprise software companies looking to buy them – or, failing that, investors looking to buy shares in them.

ABOUT THE AUTHORS
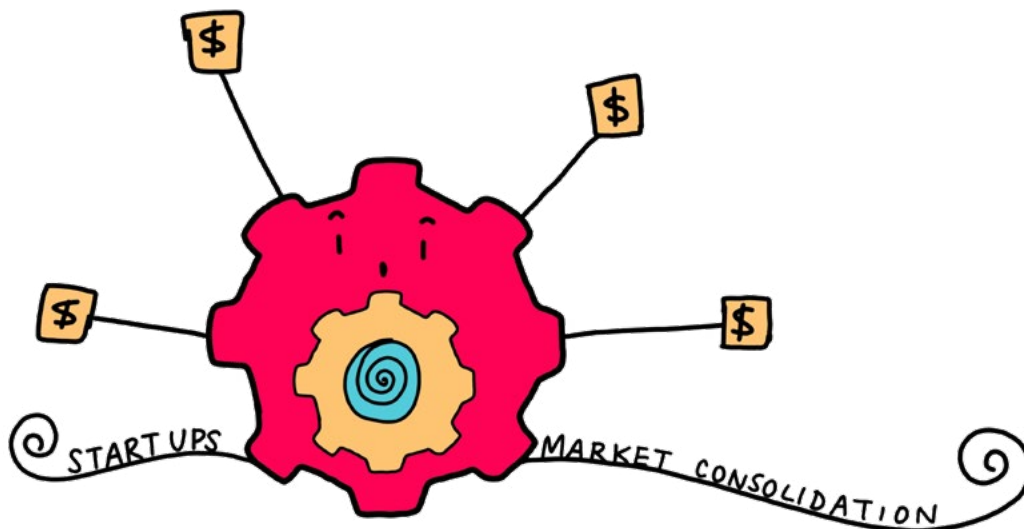
ASHTON RODENHISER

Ashton Rodenhiser is passionate about lifting the creative spirit in everyone she meets. For the past seven years, she has followed her passion for helping people communicate their ideas and combined that with creativity by founding Mind's Eye Creative Consulting.

You'll often find her with markers in hand as she's helping bring ideas to life through graphic recording and graphic facilitation practices.

She's worked with diverse groups, from non-profits to Fortune 500 companies. It may appear as if she's the silent illustrator in the room. In fact, she's helping to break down complex concepts and notions into an easily understandable visual language, helping others retain more information while inspiring people to continue practicing her techniques in the world.

Over the years, she has brought close to a thousand presentations and conversations to life, either on paper or digitally.

When she's not working with clients, she's being silly with her three young kids and husband in rural Canada.

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CHRIS TOZZI

Christopher Tozzi is an author and technology analyst who has written extensively on topics such as cloud computing, application development, open source software, virtualization and containers. He has been a full-time Linux geek since the mid-2000s, and worked previously as a sysadmin.

He also, in a past life, earned a Ph.D. in French history, a subject he once taught as a tenured professor in Washington, D.C. Today, he combines his interests in history and technology by lecturing at Rensselaer Polytechnic Institute, where he teaches courses on the intersections between IT and society.

He is the author of two full-length books: For Fun and Profit: A History of the Free and Open Source Software Revolution, which was published by MIT Press in 2017; and Nationalizing France's Army: Foreign, Black, and Jewish Troops in the French Military, 1715-1831; published in 2016 by the University of Virginia Press. He has also written a couple thousand blog posts, tutorials, whitepapers and the like over the years. He writes regularly for media sites like IT Pro Today and TechTarget, and has also written technical content for companies like Amazon, Red Hat and Sumo Logic.

He lives in Troy, New York, where, when not writing, teaching or chasing his toddlers, he engages in ill-advised home improvement projects.

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