the agile admin

What Is DevOps?

DevOps is a term for a group of concepts that, while not all new, have catalyzed into a movement and are rapidly spreading throughout the technical community. Like any new and popular term, people have somewhat confused and sometimes contradictory impressions of what it is. Here's my take on how DevOps can be usefully defined; I propose this definition as a standard framework to more clearly discuss the various issues DevOps covers. Like "Quality" or "Agile," DevOps is a large enough concept that it requires some nuance to understand.

Definition of DevOps

DevOps is a new term emerging from the collision of two major related trends. The first was also called "agile system administration" or "agile operations"; it sprang from applying newer Agile and Lean approaches to operations work. The second is a much expanded understanding of the value of collaboration between development and operations staff throughout all stages of the development lifecycle when creating and operating a service, and how important operations has become in our increasingly service-oriented world (cf. Operations: The New Secret Sauce).

A definition I've adapted slightly from something Jez Humble said is that DevOps is "**a cross-disciplinary community of practice dedicated to the study of building, evolving and operating rapidly-changing resilient systems at scale**."

But that may be a little too esoteric. I believe that you can define DevOps more practically as **operations and development engineers participating together in the entire service lifecycle, from the development process to production support.** A corollary to this is that part of the major change in practice from previous methods is that of **operations staff using a many of the same techniques as developers for their systems work.**

For this purpose, "DevOps" doesn't differentiate between different sysadmin sub-disciplines – "Ops" is a blanket term for systems engineers, system administrators, operations staff, release engineers, DBAs, network engineers, security professionals, and various other subdisciplines and job titles. "Dev" is used as shorthand for developers in particular, but really in practice it is even wider and means "all the people involved in developing the product," which can include Product, QA, and other kinds of disciplines.

DevOps has strong affinities with Agile and Lean approaches. The old view of operations tended towards the "Dev" side being the "makers" and the "Ops" side being the "people that deal with the creation after its birth" – the realization of the harm that has been done in the industry of those two being treated as siloed concerns is the core driver behind DevOps. In this way, DevOps can be implemented as an outgrowth of Agile – agile software development prescribes close collaboration of customers, product management, developers, and (sometimes) QA to fill in the gaps and rapidly iterate towards a better product – DevOps says "yes, but service delivery and how the app and systems interact are a fundamental part of the value proposition to the client as well, and so the product team needs to include those concerns as a top level item." From this perspective, DevOps is s e boundaries of "the code" to the entire delivered service.

Definition In Depth

DevOps means a lot of different things to different p rs a lot of ground. People talk about DevOps being “developer and operations infrastructure,” or it’s “using automation,” or “using kanban,” or “a toolcha emingly loosely related items. The best way to define it in depth is to use a rly complex term, agile development. Agile development, according to Wiki ur different “levels” of thing. I’ve added a fifth, the tooling level – talk abou with tools, but pretending they don’t exist is also unhelpful.

- **Agile Values** – Top level philosophy, usually a to. These are the core values that inform agile.
- **Agile Principles** – Generally agreed upon str . The Agile Manifesto cites a dozen of these more specific principles. You don’t have to buy into all of them to be Agile, but if you don’t subscribe to many of them, you’re probably doing something else.
- **Agile Methods** – More specific process implementations of the principles. XP, Scrum, your own homebrew process – this is where the philosophy gives way to operational playbooks of “how we intend to do this in real life.” None of them are mandatory, just possible implementations.
- **Agile Practices** – highly specific tactical techniques that tend to be used in conjunction with agile implementations. None are required to be agile but many agile implementations have seen value from adopting them. Standups, planning poker, backlogs, CI, all the specific artifacts a developer uses to perform their work.
- **Agile Tools** – Specific technical implementations of these practices used by teams to facilitate doing their work according to these methods. JIRA Agile (aka Greenhopper), planningpoker.com, et al.

Ideally the higher levels inform the lower levels – people or organizations that pick up specific tools and practices without understanding the fundamentals may or may not see benefits but this “cargo cult” approach is generally considered to have suboptimal results. I believe the different parts of DevOps that people are talking about map directly to these same levels.

- **DevOps Values** – I believe the fundamental DevOps values are effectively captured in the Agile Manifesto – with perhaps one slight emendation to focus on the overall service instead of simply “working software.” Some previous definitions of DevOps, like Alex Honor’s “People over Process over Tools,” echo basic Agile Manifesto statements and urge dev+ops collaboration.
- **DevOps Principles** – There is not a single agreed upon list, but there are several widely accepted attempts – here’s John Willis coining “CAMS” and here’s James Turnbull giving his own definition at this level. “Infrastructure as code” is a commonly cited DevOps principle. I’ve made a cut at “DevOps’ing” the existing Agile manifesto and principles here. I personally believe that DevOps at the conceptual level is mainly just the widening of Agile’s principles to include systems and operations instead of stopping its concerns at code checkin.
- **DevOps Methods** – Some of the methods here are the same; you can use Scrum with operations, Kanban with operations, etc. (although usually with more focus on integrating ops with dev, QA, and product in the product teams). There are some more distinct ones, like Visible Ops-style change control and using the Incident Command System for incident reponse. The set of these methodologies are growing; a more thoughtful approach to monitoring is a hot topic right now.
- **DevOps Practices** –Specific techniques used as part of implementing the above concepts and processes. Continuous integration and continuous deployment, “Give your developers a pager and put them on call,” using

configuration management, metrics and monitoring schemes, a toolchain approach to tooling… Even using virtualization and cloud computing is a common practice used to accelerate change in the modern infrastructure world.

- **DevOps Tools** – Tools you'd use in the commission of these principles. In the DevOps world there's been an explosion of tools in release (jenkins, travis, teamcity), configuration management (puppet, chef, ansible, cfengine), orchestration (zookeeper, noah, mesos), monitoring, virtualization and containerization (AWS, OpenStack, vagrant, docker) and many more. While, as with Agile, it's incorrect to say a tool is "a DevOps tool" in the sense that it will magically bring you DevOps, there are certainly specific tools being developed with the express goal of facilitating the above principles, methods, and practices, and a holistic understanding of DevOps should incorporate this layer.

In the end, DevOps is a little tricky to define, just like its older brother Agile. But it's worth doing. When left at the pure philosophy level, both can seem like empty mom-and-apple-pie statements, subject to the criticism "You're just telling me 'do my job better,' duh…" But conversely, just the practices without the higher level guidance turn into a cargo cult. "I do what this Scrum book says so I'm doing Agile" is like "I'm using Chef so I'm DevOps right?" To be a successful Agile or DevOps practitioner is to understand all the layers that explain what it is, what it might be, and what a given implementation might contain or not contain. In the end, what DevOps hopes to bring to Agile is the understanding and practice that software isn't done until it's successfully delivered to a user and meets their expectations around availability, performance, and pace of change.

History of DevOps

The genesis of DevOps comes from an increasing need for innovation on the systems side of technology work. The DevOps movement inherits from the Agile System Administration movement and the Enterprise Systems Management (ESM) movement.

ESM, which arose in the mid-2000′s, provided the original impetus of "Hey, our methodology of running systems seems to still be in a pretty primitive state despite years of effort. Let's start talking about doing it better." John Willis, whurley, and Mark Hinkle from Zenoss were involved in that, and sponsored a BarCamp around the concept. I think during this phase, initial enchantment with ITIL as a governance framework was largely overthrown for the "ITIL Lite" Visible Ops approach, as well as a shift from being "large vendor" focused – used to be, the enterprise frameworks like HP, IBM, and CA were the only meaningful solutions to end to end systems management, but more open source and smaller vendor stuff was coming out, including Spiceworks, Hyperic, Zenoss, and others.

Also in 2008, the first Velocity conference was held by O'Reilly, focusing on Web performance and operations, which provided a venue for information sharing around operations best practices. In 2009 there were some important presentations about the developer/operations collaboration at large shops (most notably Flickr) and how that promoted safe, rapid change in Web environments. Provisioning tools like Puppet and Chef had strong showings there. More people began to think about these newer concepts and wonder how they might implement them.

Somewhat in parallel, as agile development's growth in the development space was reaching its most fevered pitch and moving from niche to common practice, this turned into thinking about "Agile Systems Administration" especially in Europe. Gordon Banner of the UK talked about it early on with this presentation. A lot of the focus of this movement was on process and the analogies from kanban and lean manufacturing processes to IT systems administration. Then sometime in 2009, Patrick Debois from Belgium and Andrew "Clay" Shafer from the US met and started talking up (and coined the term) DevOps, and then Patrick held the first DevOpsDays event in Ghent that lit the fuse. The concept, now that it had a name, started to be talked up more in other venues (I found out about it at OpsCamp Austin) including

Velocity and DevOpsDays here in the US and spread quickly.

In Patrick Debois' view, DevOps arose as a reaction against the silos and inflexibility that were resulting from existing practices, which probably sounds familiar. Here's a good piece by John Willis on the history of the DevOps movement that deconstructs the threads that came together to create it.

DevOps emerged from a "perfect storm" of these things coming together. The growing automation and toolchain approach fed by more good monitoring and provisioning tools, the need for agile processes and dev/ops collaboration along with the failure of big/heavy implementations of ITSM/ITIL – they collided and unconsciously brought together all three layers of what you need for the agile movement (principles, process, and practices) and caught fire. Since then it has developed, most notably by the inclusion of Lean principles by many of the thought leaders.

What is DevOps Not?

It's Not NoOps

It is not "they're taking our jobs!" Some folks thinks that DevOps means that developers are taking over operations and doing it themselves. Part of that is true and part of it isn't.

It's a misconception that DevOps is coming from the development side of the house to wipe out operations – DevOps, and its antecedents in agile operations, are being initiated out of operations teams more often than not. This is because operations folks (and I speak for myself here as well) have realized that our existing principles, processes, and practices have not kept pace with what's needed for success. As businesses and development teams need more agility as the business climate becomes more fast paced, we've often been providing less, and we need a fundamental reorientation to be able to provide systems infrastructure in an effective manner.

Now, as we realize some parts of operations need to be automated, that means that either we ops people do some automation development, or developers are writing "operations" code, or both. That is scary to some but is part of the value of the overall collaborative approach. All the successful teams I've run using this approach have both people with deep dev skill sets *and* deep ops skill sets working together to create a better overall product. And I have yet to see anyone automate themselves out of a job – as lower level concerns become more automated, technically skilled staff start solving the higher value problems up one level.

It's Not (Just) Tools

It's also not "about the tools." One reason why I want to have a more common definitionof DevOps is that the risk of having various confusing and poorly structured definitions increases the risk that people will pass by the "theory" and implement the processes or tools of DevOps without the principles in mind, which is definitely an antipattern.

Agile practitioners would tell you that just starting to work in iterations without initiating meaningful collaboration is likely to not work out real well. There are some teams at companies I've worked for that adopted some of the methods and/or tools of agile but not its principles, and the results were suboptimal. Sure, a tool can be useful in Agile (or DevOps), but if you don't know how to use it then it's like giving an assault weapon to an untrained person.

But in the end, fretting about "tools shouldn't be called DevOps" is misplaced. Is poker planning "agile" in the sense that doing it magically gets you Agile? No. But it is a common tool used in various agile methodologies, so calling it an "agile tool" is appropriate. Similarly, just because DevOps is not just a sum of the tools doesn't mean that tools specifically designed to run systems in accordance with a DevOps mindset aren't valuable. (There are certainly a bunch of tools that seem specifically designed to prevent it!)

It's Not (Just) Culture

Many people insist that DevOps "is just culture" and you can't apply the word to a given principle or practice, but I feel like this is overblown and incorrect. Agile has not helped thousands of dev shops because the work on it stopped at "culture," with admonitions to hug coworkers and the lead practitioners that identified the best practices simply declaring it was all self-evident and refusing to be any more prescriptive. (Though there is some of that). DevOps consists of items at all the levels I list above, and is largely useless without the tangible body of practice that has emerged around it.

It's Not (Just) Devs and Ops

And in the end, it's not exclusionary. Some people have complained "What about security people! And network admins! Why leave us out!?!" The point is that all the participants in creating a product or system should collaborate from the beginning – business folks of various stripes, developers of various stripes, and operations folks of various stripes, and all this includes security, network, and whoever else. There's a lot of different kinds of business and developer stakeholders as well; just because everyone doesn't get a specific call-out ("Don't forget the icon designers!") doesn't mean that they aren't included. The original agile development guys were mostly thinking about "biz + dev" collaboration, and DevOps is pointing out "dev + ops" collaboration, but the mature result of all this is "everyone collaborating". In that sense, DevOps is just a major step for one discipline to join in on the overall culture of agile collaboration that should involve all disciplines in an organization.

It's Not (Just) A Job Title

Simply taking an existing ops team and calling them "The DevOps Team" doesn't actually help anything by itself. Nor does changing a job title to "DevOps Engineer." If you don't adopt the values and principles above, which require change at an overall system level not simply within a given team, you won't get all the benefits.

However, I'm not in the camp that rails that you 'can't have DevOps in a job title." It is often used in a job title as a way to distinguish "new style DevOps-thinking, automation-first, dev-collaborating, CI-running, etc. sysadmin" from "grouchy back room person who aggressively doesn't care what your company does for a living." Some people find value in that, others don't, and that's fine.

It's Not Everything

Sometimes, DevOps people get carried away and make grandiose claims that DevOps is about "everything everywhere!" Since DevOps plugs into the overall structure of a lot of lean and agile thinking, and there are opportunities for that kind of collaboration throughout an organization, it's nice to see all the parallels, but going and reengineering your business processes isn't really DevOps per se. It is part of an overall, hopefully collaborative and agile corporate culture, but DevOps is specifically about how operations plugs into that. Some folks overreach and end up turning DevOps into a super watered down version of Lean, Agile, or just love for everyone. Which is great at the vision level, but as you march down the hierarchy of granularity, you end up mostly dealing with operational integration – other efforts are worrying about the other parts (you can personally too of course).

Share this:

Twitter 163 | LinkedIn 68 | More

31 responses to "*What Is DevOps?*"

Pingback: What's a "DevOp?" « the agile admin

Pingback: Intro to DevOps + what we learned at DevOpsDays Boston 2011 | ZeroTurnaround.com

Pingback: Intro to DevOps + what we learned at DevOpsDays Boston 2011 | Agile Development

Pingback: Ubuntu 11.10 released, DevOps now distilled (and defined) | Journal of Technology and Economic Development | Future Technology | Green Technology | Military Technology | Business | Trading | Finance | Computer | Robots | Entertainment | Games | GPS | Soft

Carlos Gomez
December 7, 2011 at 1:23 pm

I suggest the term " DevOps Engineer" to clarify that it is not a Developer or IT operation person, it is a complete new role.

Reply

ernestm
December 7, 2011 at 5:31 pm

I don't believe DevOps is a new role or job title. It is a way of working. It is people with both developer and operations skill sets (one, the other, or a mix) working together on product teams to create products.

In a larger org, you may have some operations folks that embed into product teams and others that don't directly. You may have developers working on system provisioning tools, release automation, or monitoring and testing frameworks. Those may have specific role names, but which one is "the" DevOp? None of them, for that's not a job title.

When agile came, you didn't start calling developers AgileDevs. If a dev does test driven development, they're not a DevTester. When a QA person works closely with developers to automate their testing, they're not a DevQA. At best, agile is an adjective or something put in a job description to indicate "we want people used to collaborating in this way" – but you don't hire an "Agile." Same with DevOps. There are DevOps devs and DevOps ops and DevOps who have both skill sets and do some of both.

Reply

Bill Higgins

June 8, 2014 at 7:55 am

I agree with your point of view on the idea of “DevOps engineer” as a new, different role. I think it’s harmful for the reasons you cite above and the reasons Jez sited in his “No such thing as a DevOps team” article. However, I keep seeing people new to DevOps immediately adopt that anti-pattern, so I’ve been trying to think of a good, simple analogy to explain why it’s a bad idea.

The best I can come up with so far is two people dancing. Originally they danced awkwardly together, partially because they didn’t really like each other, but partially because they didn’t understand the other’s rhythm. Now, they’ve changed and they’re starting to figure out how to dance together better, and they’re starting to understand and even practice the other’s rhythm. The last thing you want to do is introduce a third party who acts as the broker between the two dance partners! It’s actually even more awkward!

Can you think of a better analogy or can you improve upon this one? I think it would help make this subtle concept more obvious.

kevin c

February 17, 2012 at 10:33 am

This is perfect; I’m the Scrum Master for an organization that is upping it’s agile implementation substantially. As the dev teams have ramped up the gap with OPs has become very clear, and we’re looking at how, with the people we have, to bring the OPs folks more closely into the teams as we already have with UX and QA.

Your articles, and specifically your comment above very clearly outline not only the “why” though also offer very clear ideas on the “how”.

I’ll definitely be forwarding your site on to both the product owner and VP of engineering.

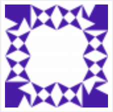
Thank you again for putting the time into this valuable topic!

Reply

Pingback: G's view of the world - On dev-ops, marketing, the c-word, and pneumonia

Ray Scott

February 28, 2012 at 11:35 am



I do not often subscribe to BLOGS as me thoughts on Agile often conflict with many of the traditional mindset Agile-ists. I found your posting on DevOps enlightening and look forward to both reading more or your postings and adding my own comments also.

I come from a rare area for Agile advocation, that of Quality, please note I did not say QA or testing. Not that there is anything negative about QA or testing, however, after 15+ years living in this area and 6+ years offering my ideas supporting the Agile Principles to my senior leadership, it has become blatently obvious that divides still exist. I have manged many QA teams on large and small projects and influence upwards with the goal to increase Quality. Until now I had never heard of the role DevOp and now I feel much more content knowing that I am a DevOp proponent.

I also recently returned to the UK after 21 years in the USA working as a Developer, Test Manager, Scrum Master and Agile coach and I have easily seen much more eagerness to move towards Agile principles than I ever saw in the USA…why? I do not know yet, but will drill down to find out.

Cheers

Ray Scott

Reply

ernestm

March 8, 2012 at 9:51 pm

Glad it's resonating with y'all! I first heard the term at Opscamp 2009, and I realized "So THAT'S what I've been trying to get at…"

Reply

Pingback: Windows Azure and Cloud Computing Posts for 4/2/2012+ - Windows Azure Blog

Pingback: DevOps | andrewleaning.com

John Graber (@JohnGraber)

August 14, 2012 at 11:00 am

OUTSTANDING. I'm a sysadmin and dba (with a strong codemonkey streak) that is just now becoming aware of DevOps. Your post was extremely helpful in making the concept clearer to me.

Reply

Pingback: Agile and DevOps: A Perfect Match

Pingback: Devops Reading List | IT Revolution

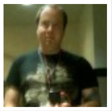
Joe

March 18, 2013 at 4:22 pm

DevOps is slowly catching on but I've noticed a struggle over control that seems to hinder it's success. It's not cut and dry, there are shades of DevOps while Dev and IT cultures slowly merge onto the same page. There's definitely a lot of baggage (processes & people) to overcome…

Reply

Phill Hocking (@phillhocking)



April 1, 2013 at 5:22 pm

Fantastic. Infrastructure and Dev have been eschewed from each other entirely too long. I am glad that the lesson has been learned we all are more useful to each other as collaborators than adversaries.

Reply

Pingback: Intro to DevOps | zeroturnaround.com

Pingback: DevOps Scares Me - Part 1 - AppDynamics: The APM Blog

Patricio

October 23, 2013 at 6:36 pm

Hi,
Would you allow me to translate this post to spanish and post it in our blog?

Reply

ernestm

October 24, 2013 at 9:05 am

Looks like you already have; that's fine but please credit/link to us here…

Reply

Patricio

October 24, 2013 at 9:58 am

Sorry about that, it wasn't support to be publish just yet.
But thanks, I'm going to update it to add the credit and links.

Thanks again.

Reply

Pingback: HomeOps: A call for the application of Devops principles at home, too | oxf8.org

Pingback: The Phoenix Project Review | BrokenOps

Pingback: Is Your Product Team Using Ideal Devops Processes? Take a Look at These Devops Best Practices | Virtustructure

grubernd

June 7, 2014 at 10:28 am

“DevOps Engineer” sounds so much better than “one man show”. gotta remember that.

Reply

ernestm

June 9, 2014 at 7:44 am

You seem to have come away with the common misconception (not from this article, clearly, but I’ve seen the popular articles on the Internet that make that claim) that DevOps means one person does everything. That is clearly not the case. “Collaboration” doesn’t mean “one man show,” it means “working together with others.” Now, working together with people does require some basic understanding of and caring about what they do – if you’re the guy who deploys apps to production but you know nothing about what the devs do, you’ll be terrible at your job. And certainly, the nature of the ops jobs are changing to require more automation – sorry, but like making buggy whips, the days of lovingly installing the OS on 20 servers by hand are passing, it’s just not professional any more. But claiming DevOps (or Agile) requires everyone to “do everything” is not credible; get out there and see some real world implementations. The trick is to help those different specialties work together without the harmful siloing and turf warring of the past.

Reply

Rajeev Kumar Gupta

June 20, 2014 at 12:36 pm

Today, I was participating in Agile India week 2014 conferncе in Bangalore and came to know DevOps ‘term’ first time. After reading this blog, I felt, for so many years, why agile community only concentrated till CI and never extended to oprations. It amazing.

Reply

ernestm

June 23, 2014 at 12:06 pm

Yes, it’s definitely one of those “how did we overlook this” moments! Welcome!

Reply

Pingback: Austin, Devops and Great Folks | Cloud Insanity