

What does it take to adopt DevOps and SRE?

Authors/Presenters

Anna Wilson, HEAnet, 5 George's Dock, IFSC, Dublin 1, Ireland.

Tiarnán de Burca, Squarespace, Ship Street Great, Dublin 8, Ireland.

Abstract

What happens when you take software development tools and apply them to network operations? You get Site Reliability Engineering (SRE).

Google pioneered it. It goes like this: there are some pretty powerful tools out there for managing software development. Automation of manual tasks, collaboration and version control, and continuous integration with automated testing and rollback. But when the infrastructure we use – servers, disks, network – is virtualised, then it becomes really attractive to start thinking about them in the same way.

So Site Reliability Engineers spend some of their time on troubleshooting and manual intervention, but they tend not to spend much of their time doing the same thing over and over. The tools give us the opportunity to turn those manual tasks into automated tests, the freedom to roll out changes in a controlled manner, and the capability to roll them back when needed.

It's all very satisfying and virtuous and ozone friendly. But the opportunity isn't enough. Industries that embraced SRE tended to do so because their growth curves mean that they *have* to.

Let's say Google, launching a new service, was facing a manual intervention rate of one incident per user for 0.001% of users a day. They might have been able to handle that with a thousand users, or ten thousand users. That calculation changes when you have a hundred million users.

So both the big guys and the startups embrace SRE because it's the only way they can keep up with the expected growth curves. Growth is the forcing function.

What about NRENS? Last year, Anna and her colleague Brian McArdle spoke about HEAnet's work in this area so far, and why we were adopting it.¹ But we've always been dancing around the *how*. Not the technical stuff; the tools are clear now. Rather, it's about the challenges we face, as people, integrating DevOps and SRE tools into our operations. We're vulnerable to the same pressures as everyone else.

Indeed, reliability on Google's terms maybe isn't even a core requirement of what we do. A modern server in any NREN data center will give you two and a half nines - which is enough for most applications for most people.

But while the urge for reliability drove the development of SRE tools, reliability isn't the only benefit they bring:

- Root cause analysis, time and space to do it right.
- Enhanced forensics, what changed and when?
- Trivial Scaling. Provide a service to one customer? Make the second (and subsequent customers) free.
- Auditability. Were the patches in place? Was the firewall rules where it was supposed to be?

¹ "Trying to replace my job with a small robot army" <https://tnc17.geant.org/core/presentation/31>

- Enhanced collaboration. Do you agree this is a good approach? Is this naming consistent?

It's very easy to dismiss these tools with "we're not Google". But we can also be empowered by it. Our challenges are valid, and are different, but this new toolbox lets us solve many of our existing frustrations.

Most of us agree that we like these tools, and would love to adopt them, but it's hard. We're special, and our clients are special, and we have all these special things that we need to do by hand.

Which is another way of saying: even though we know it would be good for us, we're not being forced to do it.

So what's our forcing function?

We're going to look both inside and outside the NREN environment to see what challenges different organisations face in trying to adopt SRE tools and processes (and it's the processes that are even more important than the tools.)

There are the immediate and near-term benefits. Once HEAnet was configuring our external peers by means of template configs, the once daunting prospect of securing our peering with filters became a short, satisfying project.

And we have clients seeking layer 2 circuits for ExpressRoute and AWS Direct Connect - again, something that's daunting if the management processes have to be built from scratch, but a pleasant and simple task if the building blocks are already in place.

We're starting to see situations like this arise more and more. But they all have workarounds that can help to avoid going the whole hog. These are very tempting because they help us get things done in the short term, even as they make the long term solution more distant.

But we're by no means the only organisations to experience this. Enterprises adopting cloud face the same pressures, and have reacted in different ways - some trying to stick as closely to their existing practices as they could ("it's just someone else's computer") while others go all in on DevOps and SRE, with mixed results.

So we're going to take what we know, and add what other organisations have learned, to find out what the obstacles really are to adopting these processes, knowing that it's not the technology - and discover the things that will finally provide the push to do so.

Keywords: devops, network, SRE, virtualisation, robot army

Biographies

Anna Wilson manages the HEAnet service desk, and works in the Network Development Department. She's deployed enough networks that she now wants a computer to do it for her.

Tiarnán de Burca has 20 years experience across many organisations from Google and Microsoft, to HEAnet, to the Special Olympic World Summer Games and disease response in West Africa. He particularly specialises in running highly reliable, scalable, secure services in the most challenging of environments.

We hope to present this topic together as co-presenters.