6POINT6

BBC NEWS –
News for a new generation

Design & Delivery of Digital Solutions

Like many organisations BBC News Online, which is facing growing competition from other news providers, needed to move its processes to the cloud in order to become more agile and to cut costs. Converting this vast and complex site with its myriad legacy applications required a complete rethink of its structure and processes and so the Corporation approached 6point6 for help. To do this 6point6 created a unique **Software Factory** to standardise and automate application deployments.

The problem

As a news provider BBC News Online is facing growing competition from social media and online aggregators. In addition, this vast, complex site comprises various legacy systems.

Migrating to the cloud was the first step in the BBC's efforts to remain the industry leader, but how could it improve the speed, reliability and cost effectiveness of its deployments to the Amazon Web Services platform in order to stay ahead of the competition?

When the BBC News website was launched in 1997 there were fewer than eight million people online in the UK. By 2017 that number had risen to around 60 million. Although BBC News Online continued to pull 30 million browsers on average a week in 2017 in the UK, today more and more people get their news from other sources.

According to recent research from the Reuters Institute for the Study of Journalism at the University of Oxford people increasingly look for news through search engines (accounting for 20 per cent of those asked) and social media (25 per cent). Today viewers expect news to be delivered more quickly than ever, be that journalistic reporting itself, or page performance and they want it to be relevant to them.

In this increasingly competitive and fast changing market with new entrants and disruptors, people are also increasingly consuming news on their phones or even via voice technology such as Alexa. Meanwhile, Artificial Intelligence (AI) and Machine Learning (ML) are also having a profound effect on the way in which news is gathered, processed and published.

New entrants and new outlets

To meet these challenges as well as the expansion to the World Service the BBC embarked on a move to deliver content to more regions around the world, improve performance, and provide a more personalised experiences to its customers. However, the BBC News website's size and its history as one of the first of online news providers make keeping it relevant particularly challenging.

"The BBC News website is part of an extremely complex range of products that make up the wider BBC site, with a number of closely associated products including the World Series sites. BBC news itself consists of so many different interconnected components each with a very specific role to play," explains Mark Debney, Head of DevOps at 6point6.

"New components are often coming online for specific events such as elections and they need to be seamlessly added to the mix."

A lack of consistency across teams and technology

The BBC has a large number of teams, many using different technology stacks. Even where the same technology was being used it would often be implemented in a slightly different way. Choosing the right technology stack for a new project was great but the knock-on effect was teams taking longer to build the initial infrastructure and operation elements, delaying the start of actual application development.

Deployments also had to be closely monitored to ensure they were successful and staff didn't have a lot of faith in the reliability of the deployment pipelines. These pipelines were created manually and the Continuous Integration and Continuous Development (CI/CD) platform was overloaded with old projects which couldn't be deleted without the record of a particular job being lost.

Teams were also focused solely on development, they lacked the time to create tools to enable DevOps, and an out of date CI/CD platform was a hindrance to automation. As a result, they were missing out on some of the best practices that are derived from having an embedded infrastructure specialist.

Relocation to Amazon Web Services

"The move into the cloud from a data centre based on conventional hardware was a major milestone but the immutable nature and the speed of the cloud meant the teams were keen to improve the methods and speed of their build and deployment process," says Debney.

The other problem, common to many businesses undergoing digital transformation, was that a number of technologies involved in the CI/CD process were known to only a few members of staff. When they left the BBC, the knowledge went with them.

The solution

6point6 created a Software Factory. This framework produces a consistent approach to fully automated CI/CD at scale. It is able to adapt to multiple teams and a diverse range of technologies.

To overcome the challenges faced by BBC News Online 6point6 created what it calls a "Software Factory". This simple but revolutionary new working practice industrialises and standardised the way in which software is released for end users. It fully automates CI/CD at scale and is adaptable to multiple teams and a diverse range of technologies.

Each pipeline follows five stages: provision, build, test, deploy and destroy. The technical methodology might vary from team to team but these principal steps are consistent. The actual pipeline code is simple but the logic controlling each step is contained and run within a specific docker container created for that particular step or technology.

The logic can not only vary but also be versioned - a team can track exactly what they are building or deploying against a specific version of the tools that they are using. This means tools can be upgraded easily, without fear of compromising other teams' deployment methods. Additional features and steps to improve the process can also be included.

Improved deployment

Deployment methods have been improved thanks to a blue/green deployment and deployments in multiple Amazon Web Services (AWS) regions around the world are now possible. Tracking and visualisations of what is installed where, by what and when have been improved as is scheduling downtime for test and development environments.

As with a real factory there's an assembly line. "Developers are able to quickly build a CI/CD pipeline that incorporates the best practices of the group, and new features can be quickly incorporated across teams," says Debney. "All this is without stifling innovation or limiting the tool sets of the development teams."

BuildPacks were also introduced. This is a templating system that enables teams to quickly bootstrap a project and allows the development teams to quickly start writing code instead of having to create infrastructure, CI/CD and other elements manually.

Developers are able to input information such as the name of their project, the technology they're using and the relevant AWS credentials. The system creates the necessary code for the infrastructure, the deployment pipeline and an appropriate test app. It then only needs to be checked into GitHub and the pipeline deployed via Jenkins.

This approach has been particularly popular at the BBC which will frequently spin up small projects for specific tasks before turning them off - reporting on elections is a typical example.

Empowering teams

Each team now has its own infrastructure and applications pipelines that enable them to start from nothing and to build their application and deploy it onto the infrastructure. This allows them to put the code they write into production as fast as possible. In addition, 6point6 reduced the need for a dedicated DevOps department and encouraged BBC teams to manage the lifecycle of the code they create from deployment through provisioning, infrastructure to testing, usage and monitoring.

There are around 12 teams each looking after multiple apps and they are constantly developing and innovating. The team that handles election news, for instance, can use the Software Factory to quickly deliver new features and microsites to site visitors rapidly, something that is essential in this increasingly competitive market.

The outcome

New features are able to be deployed more frequently and more reliably, while BBC staff are now empowered, able to keep their independence, but maintain deployment best practices across the wider group, delivering easily and cost effectively.

However, they to come it, users of the BBC News website will find new features coming to the site more frequently than ever before and a site with a wider reach throughout the world.

"We've upskilled BBC developers and handed the system back to them so that they can create applications and move them into the cloud more easily in order to make BBC teams more self-sufficient," explains Debney.

The BBC news website is supported by up to 200 separate applications and tools, around 40 of which have so far been enabled for onboarding into the Software Factory.

The Software Factory offers a standard package that can be tailored to meet the needs of any large organisation. "What we've created and tested here is not only a way to empower development teams to build, test and release software with speed, frequency and agility but allow them to do so without the need for dedicated DevOps resources embedded in every team," says Debney. "It's an approach we can readily repeat and share."

About 6point6

Integrating digital technology into your business can result in fundamental changes to how you operate and deliver value to your customers. To go digital is to reinvent yourself to the core, opening yourself and your clients to a world of possibilities.

6point6 is a technology consultancy. We bring a wealth of hands-on experience to help businesses, including financial services providers, media houses and government, achieve more with digital. Using cutting edge technology and agile delivery methods, we help you reinvent, transform and secure a brighter digital future.

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