Cardano Group
The power of containers in finance

20-30	75%	75%
dev days saved per quarter	energy savings	reduction manned support

Who is Cardano?

Founded in 2000, the Cardano group is a privately-owned, purpose-built risk and investment specialist, and a financial pioneer. It is widely recognized as a market leader in the provision of specialized services to private-sector and collective pension schemes in the United Kingdom and the Netherlands.

Cardano's mission is to maximize its customers' investments through intelligent trade in equities, derivatives, foreign exchange, options and exotics. The company was founded in Rotterdam, in 2000; later opening an office in the UK. Between Rotterdam and London, Cardano has clients whose assets exceed £140 billion.

"Everyone's done the 'hello world' foray into containers, but when it actually comes to production and release, it's a different beast. Rancher is a really nice solution that fills all the gaps that you discover when deploying containers to production." Alison Johnston, CTO, Cardano

The group recently acquired NOW: Pensions Ltd, the group's first venture in the retail pensions market. From managing a select portfolio of corporate clients, to becoming the third largest retail pension provider in the UK, the Cardano group is now preparing itself for rapid growth.

Charting the path towards containers

With a desire to expand Cardano's leadership position in the pensions world, and aspirations to become a leader in the consumer pensions market, the technology team's primary focus has been to transform the group's IT infrastructure to keep pace. To maintain stability and keep innovating, whilst moving from 60 large clients to millions of individual customers, Cardano knew it had to scale dramatically.

Originally, Cardano's .net and SQL-based infrastructure had been developed to suit the needs of its financial analysts - the code written for specific functions and requirements. Bespoke internal systems suited the group for a while, but the architecture couldn't scale with Cardano's growth. The team needed to migrate to a modern, web based, scalable API and microservices-centric architecture.

"It's a lot to expect front-end developers to start learning swathes of back-end development; shell scripting etc. Having the Rancher UI was definitely a big win for us in terms of getting the dev team to pick it up quickly, go in and get closer to the infrastructure." Alison Johnston, CTO, Cardano

Containers have become an intrinsic part of the strategy since CTO Alison Johnston, and Senior DevOps Engineer David Sanftenberg, joined Cardano three years ago. With a shared history working in engineering at Goldman Sachs, they had experimented with containers and knew they wanted to bring an automated, scalable and container-centric approach to Cardano.

The team had a number of major challenges to contend with, including the building of new data web platforms. Consequently, the team wanted a way to onboard and manage Kubernetes in an intuitive way. With scarce resources, they needed a platform that would automate much of the difficult back-end processes and that would allow developers to get closer to the infrastructure.
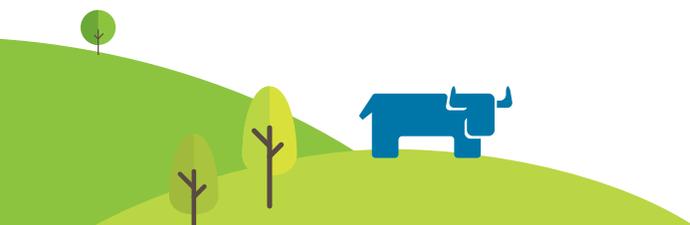
Doing this, they knew they could free up vital time and expertise to focus on their major infrastructure projects. Looking at a number of Kubernetes distributions and orchestration platforms, most options lacked the right User Interface (UI); then the team started working with Rancher.

Automation, resilience and efficiency

The automation of a host of basic functions has been one of the biggest reasons for bringing Rancher into Cardano. With two major development projects running concurrently, the team needed a stable platform that would automate several development processes and simplify the lifecycle (role-based access control (RBAC); Namespace-as-a-Service (NaaS); authentication; Application Catalog etc.)

Historically, many basic tasks performed have been heavyweight in terms of manual operations and internal processes. The primary objective was to automate as much of the team's daily business as possible - even major workloads running within BPM platforms such as Camunda. Cardano's portfolio management system, for example, is a node.js web app with node.js APIs. As Camunda works perfectly in containers, teams can access the platform via the API; view the portfolio, their current position, place orders and trade easily. Whereas this was always done with spreadsheets, teams can now use the container workflow which has dramatically reduced workload.

The team estimates its developers have saved 20 - 30 days' support per quarter working with Rancher.

Stability
Importantly, Cardano's portfolio management system is far more stable and reliable when running in Rancher. The team has found it easy to deploy multiple different tools and services easily, and at the same time, whilst maintaining overall stability. Historically, they would set up special servers for separate services, this was time-consuming and would slow down the development cycle. Moving to a containerized architecture in Rancher, the team can prototype and deploy Jupiter Hub, Rabbit MQ, and a host of other solutions, simultaneously within the same platform whilst writing node js web apps and services.

What were the problems Cardano was trying to solve?

Energy and Environmental Efficiencies

The flexibility of the platform has resulted in significant energy efficiencies, too. Running services in the cloud can result in significant costs if running an 'always on' model. By virtue of running Rancher in Azure, Sanftenberg has developed a script which allows them to power down certain services overnight. Any non-production workloads are off during the night but can be spun up again in minutes the next morning. As a result, the team have been able to reduce costs by over 75 percent.

Becoming a leader in retail

Earlier this year, Cardano took a major step towards becoming a leader in retail pension provision. With the acquisition of NOW: Pensions Ltd, the group has gone from managing a select portfolio of corporate clients, to becoming the third largest retail pension provider in the UK, with millions of individual customers. Not only is the sheer volume of customers dictating a shift to containers, it's also a shift in portfolio development and provision, in line with market changes. A more tailored approach requires Cardano to manage millions of pension accounts directly. As NOW: Pensions integrates with Cardano's infrastructure, Rancher brings the ability to scale at speed. Johnston and Sanftenberg can quickly spin up multiple instances of parallel servers - on demand and at no cost. This is particularly important at peak times (end of year statements); Rancher allows the team to scale the infrastructure up and down, as activity surges.
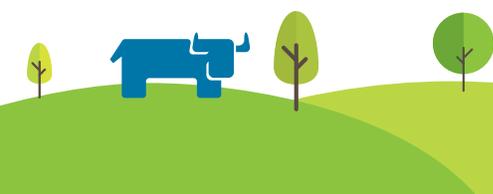
The cloud is important, too. Cardano wants to maintain an agnostic approach which can flex according to rapidly changing needs. The team sees the value of running Rancher in Azure, equally, the infrastructure has to be flexible enough to allow a blend of on-premise, hybrid private and public cloud, as needs change. This is critical for an organization that will become the custodian of millions of gigabits of sensitive data. Rancher brings an ability to scale clusters up and down, regardless of cloud preference.

'Shift Left'—empowering DevOps

Finally, a major driver in the move to Rancher was the desire to create a self-service ecosystem for developers. With self-service becoming a major internal policy, Johnston and Sanftenberg's key role is to empower developers to work autonomously. Working within the Rancher framework and UI, Cardano developers find it easy to set up a new service or a new environment.

"We found that the better versed developers are in the systems where they're running their containers and their software, the better their development becomes." David Sanftenberg, Senior DevOps Engineer, Cardano

Unlike the old method, putting in a request and waiting for an infrastructure engineer to set up a server and install on their behalf, developers can come to the platform, build a container within Rancher and deploy it themselves. Unlike the experiences of the past, where code is committed and runs somewhere in a remote location, Rancher has made the process of developing and committing code transparent through the lifecycle. Developers can see the code running in situ and retain control over its management. By allowing developers to get closer to systems, the team believes project quality has increased.

What's next for Cardano?

Last year was about building platforms, this year is all about stabilizing and automating them. The team has invested heavily in new technologies, now it's time to build controls around it. The ultimate aim is to provide developers with a way to push code without needing to log into a terminal, or access Rancher. By putting a structured approval process in place, developers can deploy code with a few simple commands, further simplifying developments, and accelerating innovation.

> **"In Rancher, we can easily prototype a solution and then deploy it. Whereas if we had to set up special servers for rabbit MQ and so on, it's much more difficult. You can't move as fast."**
>
> David Sanftenberg, Senior DevOps Engineer, Cardano

With the onboarding of NOW: Pensions, the team is now evaluating the integration of this completely different system—Java and AWS—with Cardano's infrastructure. In particular, development teams on both sides are looking forward to experimenting with Istio - native in Rancher 2.3.
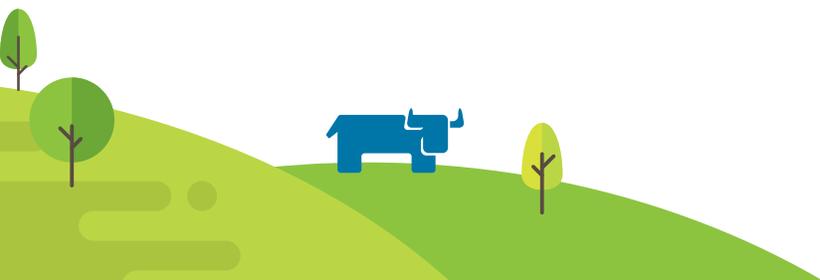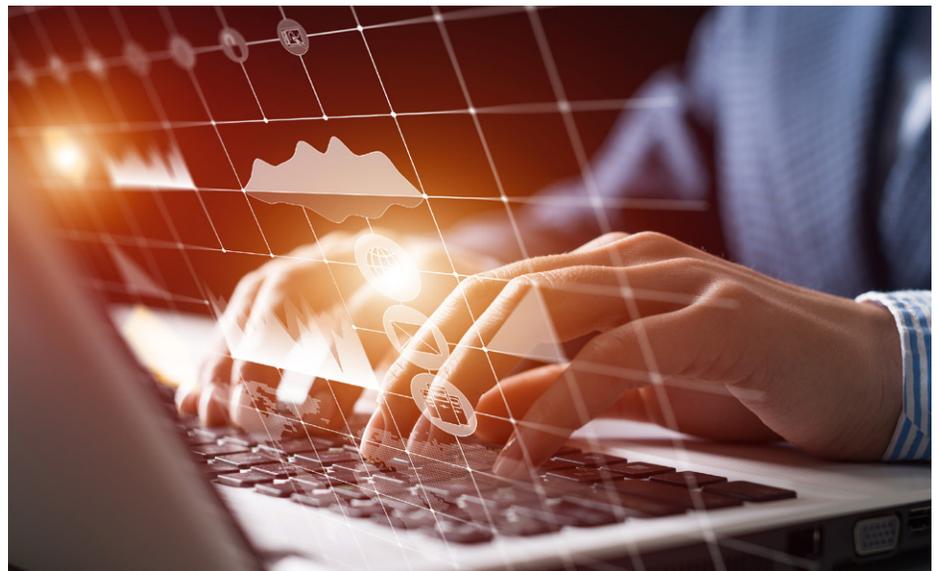
How did they plan their migration to Rancher?

Journey

1. Early adopters of containers; 6 month project to transform infrastructure in readiness

2. Evaluated a number of different options but none provided the right UI and tooling

3. Two-month initial PoC carried out in 2016

4. Initial cluster running on Azure alongside network service provider

5. Two to three apps to get a feel for the platform

6. Successful PoC results in onboarding of Rancher late 2016

What have been the benefits?

Benefits

- 20 - 30 development days saved per quarter working with Rancher

- Energy costs reduced by over 75 percent when powering down non-production services overnight

- 75 percent reduction in manned support when using containers

- Only one update cycle: compliant with UK regulations, this has dramatically reduced man-hours

- Better stability

- Project quality has increased

- New projects launched more quickly

- Customer base growing and innovation hastening

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