END USER JOURNEY REPORT: Spotify

The CNCF End User Community helps end users navigate the cloud native ecosystem, recruit talent, and successfully adopt cloud native tools and technologies. It allows organizations to identify the best uses for cloud native and then develop and deploy implementations that take advantage of the agility, flexibility, and cost-effectiveness of cloud native technologies. It is the largest end user community of any open source foundation or standards body, with more than 140 members.

The End User Journey report highlights active End User Community members and demonstrates how these organizations grow as technology leaders and benefit from joining the CNCF End User Community.

Our first End User Journey report looks at Spotify, the organization behind the world's most popular audio streaming subscription service. The company was an early member of the End User Community, joining CNCF in early 2018 after beginning a transition to cloud native and Kubernetes-based infrastructure. The team quickly realized that CNCF membership would enable it to innovate faster with open source technology.

Since then, Spotify has become one of the largest contributors and thought leaders inside CNCF, contributing the rapidly growing Backstage project, serving as an End User representative to the Technical Oversight Committee, and being a leading evangelist at CNCF conferences. To date, Spotify team members have made more than 27,000 contributions to 13 CNCF projects.

BY THE NUMBERS:

KUBECON + CLOUDNATIVECON

2 KEYNOTES   **15+** TALKS

27K+ CONTRIBUTIONS TO 13 CNCF PROJECTS

Backstage — CONTRIBUTED THE BACKSTAGE PROJECT TO THE CNCF SANDBOX

DAVE ZOLOTUSKY IS AN END USER REPRESENTATIVE ON THE CNCF TOC
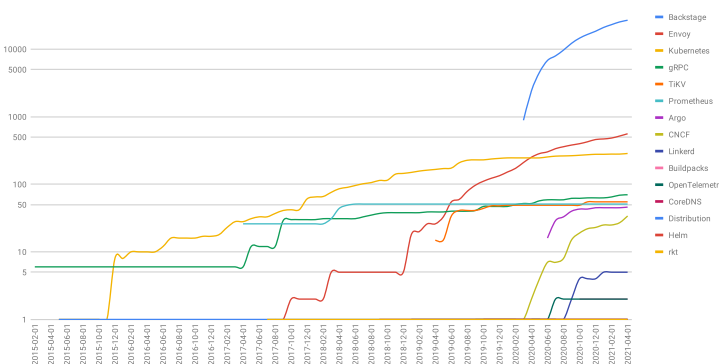
JAMES WEN IS CO-CHAIR OF THE DEVELOPER EXPERIENCE SIG
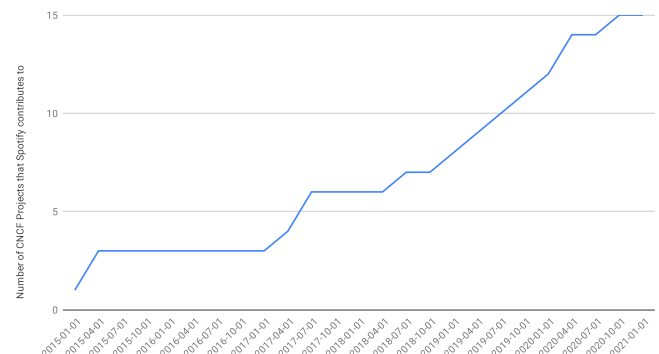
1 CNCF END USER CASE STUDY

TODAY, SPOTIFY IS AN ACTIVE USER OF CNCF PROJECTS, INCLUDING:
argo   fluentd   Open Policy Agent   gRPC   envoy   kubernetes

SPOTIFY OPERATES MORE THAN 150 KUBERNETES CLUSTERS RUNNING OVER 2,800 SERVICES ACROSS ALL ITS SOFTWARE LIFECYCLE.

SPOTIFY CONTRIBUTIONS BY CNCF PROJECTS
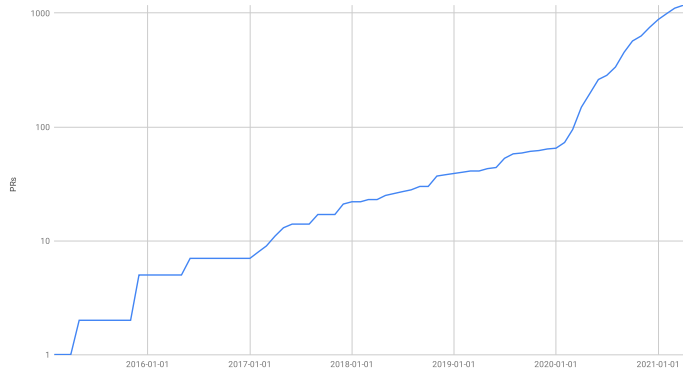

Legend: Backstage, Envoy, Kubernetes, gRPC, TiKV, Prometheus, Argo, CNCF, Linkerd, Buildpacks, OpenTelemetry, CoreDNS, Distribution, Helm, rkt
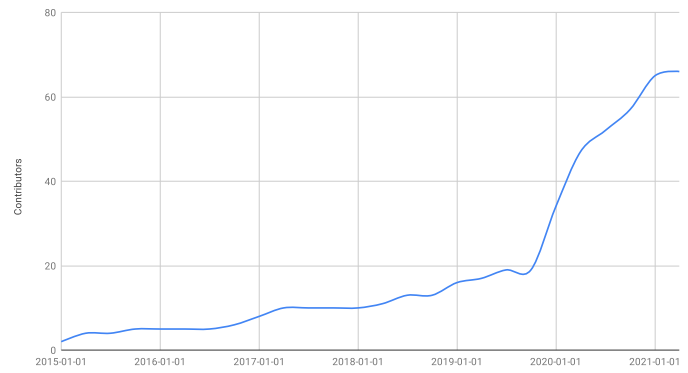
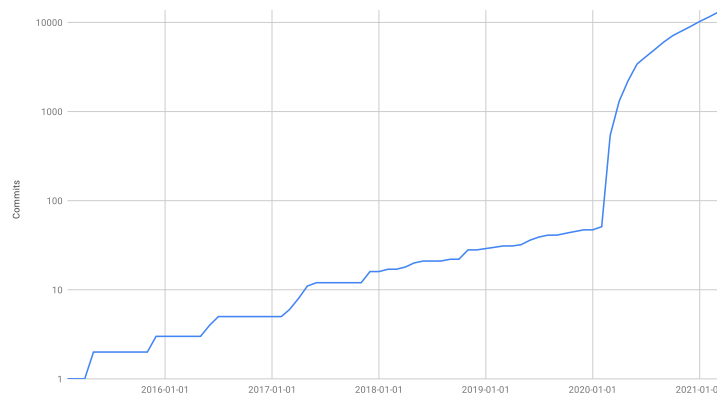## TOTAL NUMBER OF CNCF PROJECTS THAT SPOTIFY CONTRIBUTES TO

MONTHLY GROWTH OF SPOTIFY PRS

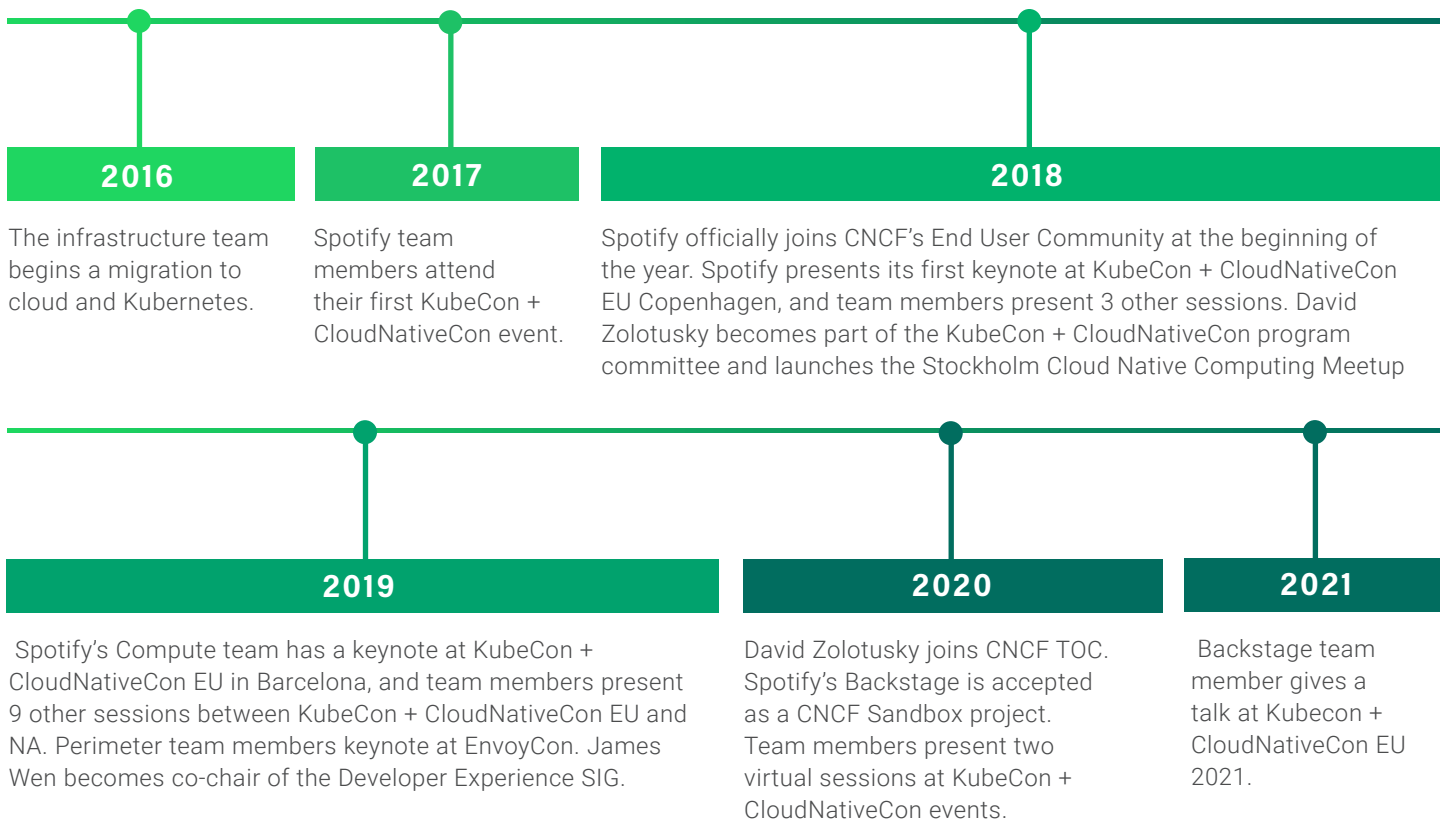## NUMBER OF SPOTIFY CONTRIBUTORS TO ALL CNCF PROJECTS

SPOTIFY COMMITS

SPOTIFY'S JOURNEY TO CNCF

Spotify is an early adopter of modern infrastructure technology and practices. The company ran containerized microservices across its VMs as early as 2014. To manage these, the infrastructure team built its own container orchestration system called Helios. After starting their migration to the public cloud in late 2016, the team realized it would be better to adopt an open source orchestration tool that was widely adopted and had a growing ecosystem of users and compatible tools. Having a team dedicated to Helios' upkeep and functionality would be more time-consuming than adopting a solution that was supported by a larger community, and that would quickly outpace what a small team could do when it came to features. So Spotify turned to Kubernetes and the burgeoning CNCF community, which had more than 56,000 contributors at the time.

"We saw the amazing community that had grown up around Kubernetes, and we wanted to be part of that. We wanted to benefit from added velocity and reduced cost, and also align with the rest of the industry on best practices and tools." – Jai Chakrabarti, Director of Engineering, Infrastructure, and Operations at Spotify.

Seeing the value of community is what led Spotify to join the CNCF End User Community in 2018. CNCF and KubeCon + CloudNativeCon events became a place for sharing knowledge among engineering teams from various organizations. That free exchange of experiences and insights — and being able to do so all in one place — represents both the benefits and the responsibilities of being an active open source citizen.

TIMELINE

2016
The infrastructure team begins a migration to cloud and Kubernetes.

2017
Spotify team members attend their first KubeCon + CloudNativeCon event.

2018
Spotify officially joins CNCF's End User Community at the beginning of the year. Spotify presents its first keynote at KubeCon + CloudNativeCon EU Copenhagen, and team members present 3 other sessions. David Zolotusky becomes part of the KubeCon + CloudNativeCon program committee and launches the Stockholm Cloud Native Computing Meetup

2019
Spotify's Compute team has a keynote at KubeCon + CloudNativeCon EU in Barcelona, and team members present 9 other sessions between KubeCon + CloudNativeCon EU and NA. Perimeter team members keynote at EnvoyCon. James Wen becomes co-chair of the Developer Experience SIG.

2020
David Zolotusky joins CNCF TOC. Spotify's Backstage is accepted as a CNCF Sandbox project. Team members present two virtual sessions at KubeCon + CloudNativeCon events.

2021
Backstage team member gives a talk at Kubecon + CloudNativeCon EU 2021.

SPOTIFY END USER COMMUNITY BENEFITS:

POWER OF COMMUNITY

With more than 123,000 contributors to its projects, CNCF is the world's largest community of open source developers. No one team at any one company can match that firepower.

In 2020, Spotify had its first open source project accepted to CNCF, Backstage, to increase the velocity of its development and contribute learnings back to the broader community. Backstage is a developer portal that prioritizes developers and their software to create the most effective developer experience in the world. It has been adopted by organizations including American Airlines, Fiverr, Peloton, Roku, Zalando, and others. At the time, Spotify contributed Backstage to CNCF, the project it boasted a healthy and growing community, with more than 180 contributors to it. Almost half of pull requests were coming from external, non-Spotify contributors. It now has more than 280 unique external contributors and adds 10 new contributors every week.

"It has been chaotic but amazing. Everything from the number of adopting companies to new contributors has increased exponentially since Backstage became a CNCF project," says Austin Lamon, director of product for the

Spotify team helping to lead the Backstage project. "We're figuring out the right ways to harness this chaos in order to scale and move the project forward in a way the community wants but in a way that also serves adopters. Keeping an open conversation with the community is key to this."

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ACCESS TO CLOUD NATIVE EXPERTISE

Even before joining CNCF, many Spotify engineers were open source contributors. As an End User Member, Spotify has immediate access to CNCF staff to help further encourage and shepherd contributions.

"By being a part of CNCF, our eyes get opened to things we should have been thinking about but weren't," says Dave Zolotusky, Spotify Principal Engineer. "It's been surprisingly easy to get in touch with anybody we want and to get expertise on things we're working on, and it's helped us validate what we're doing. The community has been extremely helpful in getting us to work through all the technology much faster and easier," Zolotusky says.

Access to End User Member-only events and sessions at KubeCon + CloudNativeCon, the largest open source developer conference in the world, is another example of how being a CNCF member boosts access to cloud native expertise. "They are focused on engineering and getting stuff done," Zolotusky says. "No matter what our tech questions are, we can get answers." In one day at KubeCon, Spotify employees meet with more people than they would at numerous other technology conferences combined, Zolotusky says.

TECHNICAL REPUTATION

As a member of CNCF, Spotify contributes to work on emerging, leading-edge open source technologies. Already known as an innovator in music and audio, Spotify's open source contributions give more visibility to its role as a tech leader while also providing opportunities to demonstrate the company's commitment to the developer community at large. "Spotify is known for the world's most popular audio streaming subscription service, but it's also important for us to have a strong reputation as a great technology company that solves complicated problems, and contributes back to open source in a meaningful way," Zolotusky says.

In May 2018, Spotify landed its first spot on the Keynote stage during KubeCon + CloudNativeCon Europe, with Dave Zolotusky talking about becoming a strong member of the CNCF community. The following year, David Xia, infrastructure engineer, told the event's nearly 8,000 attendees the story of Spotify accidentally deleting all of its Kubernetes clusters with no user impact. Since joining, Spotify employees have presented more than 15 sessions at KubeCon + CloudNativeCon conferences and colocated events, including EnvoyCon and gRPCconf.

Spotify contributed Backstage to CNCF after talking to others at KubeCon about the project and seeing their excitement in its value. "Getting a project into CNCF was a metric for improving our standing in the open source community," Zolotusky says.

VOICE ON DIRECTION

In serving as an End User representative on CNCF's TOC, Zolotusky listens and learns about what other end users do with various technologies and then guides and votes on development directions that best benefit the preponderance of end users.

Being a part of the ecosystem provides the opportunity to help direct other open source projects with great potential. End users play a crucial role in the feedback loop for technology builders, reporting bugs and what new features would be most useful. Part of being a great open source citizen is about being active within communities rather than just being a consumer. "It is important for the ecosystem to function as a two-way street," says Zolotusky. When putting your own projects out into the community, there is a big opportunity to learn from others. "You can't expect to release an open source project and gain users without having to do more work. It's important to work as peers rather than to believe that you're always going to be the leader or teacher."

James Wen, a senior site reliability engineer at Spotify, also heads up the Developer Experience (DX) SIG as a co-chair. This group meets regularly to discuss best practices for end users and suggest improvements to the End User Community.

TALENT RECRUITMENT AND RETENTION

Since joining the CNCF, Spotify's involvement with open source projects has increased. Participation in the Foundation has helped highlight the importance of open source within the organization and has encouraged more Spotify members to learn from and contribute to projects.

Involvement in CNCF and KubeCon + CloudNativeCon has provided opportunities for Spotify employees to take leadership roles in the open source community. Since becoming a CNCF member, Spotify employees have delivered KubeCon keynotes, become core maintainers for projects, headed up developer groups, and joined KubeCon panels.

OPEN SOURCE HELPS BUILD CAREERS

Kateryna Nezdolli

Kateryna Nezdolli's story highlights exactly how involvement with CNCF and participation in the open source community provides a strong path of learning and career accomplishment. Kateryna is a senior engineer at Spotify. Her work on open source technologies has been important to her growth as a professional. Kateryna started spending one to two hours a day of her own time on open source technologies. As a result of her dedication, Kateryna and her manager agreed that she would devote one day a week to open source work of her choosing. Kateryna's commitment helped her expand her range of skills to technologies that were not necessarily a part of her regular projects at Spotify, such as C++. As a result of her open source work, Kateryna began speaking at events like EnvoyCon and was able to experience the rewarding work of mentoring others.

"I started as a personal contributor, and that unlocked a lot of opportunities for me," Kateryna says. "Now, I'm considered an expert. It has been a great experience, building connections, expertise, and confidence."

As of the publication of this report, Kateryna was seeking Envoy Proxy maintainer status and has become her Spotify team's "Envoy expert." She is also working on two high-profile projects within the ecosystem – Slow Start load balancing and overload manager — and was involved in the QUIC support project in Envoy.

Austin Lamon

Austin Lamon is director of product on the platform team at Spotify, where he leads the Backstage project and related initiatives. He became involved with CNCF as a member of the core infrastructure group with projects like Kubernetes, Envoy, and gRPC.

Spotify's involvement in CNCF provided Austin with good opportunities to see and participate in the successful growth of open source projects. Seeing the rise of Kubernetes and Envoy, Austin worked to encourage their adoption, along with other CNCF projects, at Spotify. The successful widespread adoption of these projects helped to show Spotify how it, too, could share something exciting with a broader community to help it improve and scale. His involvement helped Austin realize he was deeply inspired by improving the developer productivity space via open source, which led to his focusing solely on Backstage.

Before joining CNCF, the inclination at Spotify was to "just build," he says. "CNCF has been a good push to get a nice balance between just buying or just building but then contributing back. CNCF creates an environment for projects to flourish. By contributing back to the project, we can influence its direction in a way that helps all adopters of the technology," Austin says.

Austin first experienced CNCF and its conferences as a place to learn and, subsequently, as a place to contribute. Austin now looks to CNCF for expertise, community, and as a place to share learnings. Austin has presented three times at KubeCon events.