Hey, welcome to Open Source Voices. My name is Nicole Huesman.

Over the last few years, we’ve seen this spectrum of containers and virtual machine technologies. Kata Containers brings together the best of both of these worlds, and the project team just recently celebrated its 1.0 release.

Today I’m really excited to be joined by members of this team—Eric Ernst, the lead Kata Software Engineer at Intel, and Anne Bertucio, Community Manager for Kata Containers who works at the OpenStack Foundation. Eric and Anne, thanks for joining us.

Eric, can you start us off by introducing yourself and what you do at Intel.

Sure. I work at the Open Source Technology Center. About two years ago, I moved from working on kernel work into the cloud—kind of an abstract area above. That’s when I started working on Clear Containers and getting my head around the whole container ecosystem.

Excellent! And Anne, let’s hear a little bit about you and your role in Kata Containers.

Sure. Like you mentioned, I’m the community manager for the Kata Containers project. I’m on staff at the OpenStack Foundation, and as Kata’s been this new project, the community management. We’ve done everything from thinking about when are we going to release to what time is the meeting and where do I get some stickers. It’s making sure we get this thing off the ground. It’s been a lot of fun.

Q: So with that, let’s start off with a high-level overview. Eric, can you talk to us about what container technologies offer, and the impetus for Kata Containers. What problem was the team looking to solve?

So, the way I see containers, they offer a couple of different things. One, they have a nice way of creating a portable, flexible software that can easily be deployed. And then two, that’s enabling a new design pattern—to be able to introduce the idea of microservices. What we saw, and what led to the start of what is now Kata Containers is that often people won’t deploy containers on bare metal out of concerns of this is only isolated using kernel software mechanisms from the Linux kernel—basically, namespaces and c groups. And that wasn’t enough for a lot of people who are doing production, especially in shared environments. So, the first thing someone would do is they’d create a virtual machine. And then after that, they’d go ahead and deploy containers on it and run happily. What we were curious to investigate was how can we use something like hardware virtualization to provide that hardware protection—that stronger isolation—that they’re getting by creating a full-blown virtual machine? Can we bring that into the container ecosystem? Can we use that as the method of isolation while still keeping the same design pattern? By design pattern, I mean minimal footprint and speed and everything else that you’ve come to expect with containers.

Q: There are lots of different container projects and solutions that already exist. What do you think Kata Containers brings to this container ecosystem that’s different?

Really, what we were looking to do is to do our best to pretend not to be a virtual machine. So, from a user standpoint, make it look and feel just like a container would, both again from a performance perspective, both in boot and footprint, but also look at workloads just to make sure that nothing has to change, that all of the existing workloads, we will go through and make the translation necessary for
using a hypervisor like QEMU in our case and translate that. So, I think that that’s a bit unique. Well, stepping back, it wasn’t completely unique. We had worked internally on Clear Containers for a couple of years and the company Hyper.sh was working on a similar solution called RunV for a couple of years. We saw that and worked together, and that’s actually what was the basis of creating Kata Containers. I would say, now that it is a joint project and it’s externally governed and it’s being contributed to by many people, it is now a unique solution, I think.

Q: Excellent. Thanks, Eric. So, Anne, this project was formed under the OpenStack Foundation. Can you tell us a little bit about the project from a governance perspective and how things work?

At the OpenStack Foundation, one of our guiding principles is what we call the 4 Opens: Open Source, Open Design, Open Development and Open Community. And in December, we announced the Kata Containers project. We said, here’s our intention, we’re working towards this 1.0 release. And from December to 1.0, we had those four principles as the only pillars to guide us. How are we going to create this community, and what is it going to look like? We did have some established parts. We have an architecture committee, which guides the technical direction, and we have what we call the working committee, which is more developer advocacy and outreach, community and marketing—that’s on the working committee side. So, we had those four pillars to guide us as we’re thinking about what do elections look like? What does governance look like? Who can participate? Who can run? To answer some of those questions, we’re open source, so anyone can participate, anyone is welcome to join and get involved, contribute code upstream. And as we head into our first election for the architecture committee seats, it’s really the people who have been active and are involved in the community, they’re welcome to run for those architecture committee positions and the people who will vote on them are the people who have been doing the work over the past year. What makes open governance so exciting is that it is what you want it to be, and what we have set up is how the community has decided we think open source governance should look like. Kata Containers is licensed under Apache 2.0, which is one of the more permissive open source licenses that are out there. Anyone can come and contribute, anyone can take an idea and run with it, they don’t have necessarily the pressure of knowing that they have to contribute it back, so it allows for a lot of creativity and it’s an open door for involvement.

Q: Tell us a little bit about who is involved in the project today, and who’s engaged in the community. Particularly for how young we are, we have a pretty diverse and healthy community from an organizational perspective. So, obviously, Intel and Hyper, who are the two founders that got things going, but we’ve also had support come in from Dell, Red Hat, ARM, Canonical. We’ve got a company called VexHost doing some infrastructure donation to keep Kata’s CI systems up and running. And then we’ve got this smattering of companies around the globe like Google, Huawei, United Stack, Tencent, SUSE, NetApp, China Mobile, City Network, Mirantis, just this big group of companies that have said, we think this is a great project and we believe in what it’s doing and the problems it’s solving.

Q: Integration can often make or break an open source project. Eric, when we think about the value of Kata Containers, can you talk about how it integrates with other components in the ecosystem?

Early on, the goals for the project were to integrate and to provide an OCI-compliant runtime. OCI is the open containers initiative that is used, more or less, to define what the existing canonical solution runC uses. So, we look to be fully compatible and to be able to just drop in and plug in. We’re not replacing Docker. We work inside of Docker. We’re an extra runtime that you can use to complement the existing solution of Docker. Because of that, we plug in anywhere that expects an OCI-compliant runtime. So, if
you look at a higher-level orchestrator like Kubernetes, we integrate into Kubernetes via CRI interface—that’s a container runtime interface. Runtime is used in many different places. This is essentially a shim that allows people to provide an alternative runtime for Kubernetes. And two of them in particular rely on an OCI-compliant runtime—and in fact, a couple of OCI-compliant runtimes. That’s container D as well as CRIO. So, both of these allow for plugging in different OCI-compliant runtimes. So, when you look at Kubernetes, that’s exactly how we integrate and again behave just like any other solution that you would expect in the container ecosystem.

Q: It just seems Kata Containers brings such value when you talk about the speed of containers with the security of VMs, right. You no longer need to make that tradeoff. Who do you think will benefit most from this project when we talk about different customers, different use cases?

Yeah, one of the things that’s really exciting about Kata is we’ve developed a pretty universally-applicable solution. We expect to see it across industries, across verticals, anyone who wants that security benefit, this is probably going to work for them. Just thinking of, we had our 1.0 release, and what are these very first features going to be. I think, obviously, for folks who are on Intel Clear Containers or Hyper RunV, Kata Containers is now their next upgrade. So, we think those folks are going to come on, be the first users. But after that, if I was a betting woman, I think we’re going to see a lot of folks who are on public clouds and, for whatever reason, they think ‘I want that added layer of security’. Maybe they have high risk profiles or they’re in regulated environments and they think, ‘I want to block out my neighbors for sure, I want to know that I’m doing that.’ So, we’ll probably see that I’d imagine other risk-adverse verticals like finance, healthcare, anybody who’s really dealing with personal information or big secrets, things like that, we want to block out your neighbors. I think we’ve heard a lot from people who are doing software-as-a-service things where I want to take in some code—some inputs—from a user, and I don’t trust them and I also don’t trust User B, bring in code from both of them, run them in isolation just in case we don’t know what they’re up to, but continue to keep my services up and not have to have a separate VM for every one of those instances or a separate Kubernetes instance for every one of those. ... Like Eric was speaking to, these standards that we’ve used in writing to the OCI spec, it’s the beauty of standardization that we really do have a pretty universally-applicable solution here.

Q: Eric, when we look forward, can you give us a sneak peek into the roadmap for the project and what the team is focused on for the next release?

Anne talked about some of the people who are using Clear Containers and RunV today. There are a couple of features that we’re looking to land, a couple things around network hot plug, and then some other enhancements that will allow people to upgrade from RunV to Kata Containers. For me, this is the most exciting part. Some of the people who are using RunV today, to get them using Kata in production, I think will give a lot of credit to our stability and to our solution as a whole ... Once that list starts growing, I’m really excited for the project. We have a lot to be busy with, but thankfully, at the same time, there are a lot of people who are coming in and saying, ‘My company’s interested in this project, but more specifically, they’re interested in us also contributing to it, you know, where can I help’, and this is a great problem to have, and it’s a view of where we’re at today.
Q: So, Anne and Eric, if listeners want to learn more about the Kata Containers project, where do you recommend they can find more information about it?

So, the one-stop-shop is katacontainers.io, that’s our website where you’ll find our github. We’re doing a lot of development on github. We also have a developer mailing list, list.katacontainers.io, so people who are interested in being a part of those development conversations, that’s the place to do that. We use both Slack and IRC in our communities, so we’re on IRC Free Node kata-dev and kata-general, and on Slack. If you go to the website, you’ll find the link for the Slack invite to get the bridge to those IRC channels. You’ll also see on the website we have weekly architecture committee meetings, and it being open source, anyone is welcome to come swing on by. The working group meets every other week, and you’ll see that schedule on the website. It’s kind of a smattering of in-person events where you can catch Kata as the conference circuit kicks off for the season. We have a talk at Open Source Summit North America in Vancouver at the end of August, and then we’ll also be at Container Camp U.K. in London on September 6 & 7. So, there are a couple places you can meet Kata in person. Or, if you want to get involved, stop by online and come chat with us.

Thanks for joining us today, Eric and Anne. I appreciate it. We’re really looking forward to seeing more from the Kata Containers team and to see how the project evolves.