Open Source Collaboration Speeds

IO and Networking Development

Leveraging The Linux Foundation's Open Source Expertise

ABOUT PLUMGRID

PLUMgrid is the leader of secure and scalable virtual network infrastructure solutions for OpenStack and Container clouds. They deliver industry leading software-defined networking (SDN) and network functions virtualization (NFV) solutions that enable modern data centers to connect tenants, applications and workloads efficiently across hypervisors, virtualized, container and bare metal architectures. PLUMgrid is headquartered in Santa Clara, California and is funded by venture capital and strategic investors.

www.plumgrid.com

HIGHLIGHTS

- Technical collaboration had been challenging without a strong framework and guidance in place.
- Implementation of lightweight governance model facilitated better collaboration with members and enabled technical steering committee to focus on smart growth of the technology.
- IO Visor experienced expedited community interest and growth by leveraging The Linux Foundation's existing open source network.

About IO Visor

The IO Visor Project is an open source project and community of developers committed to accelerating the innovation, development, and sharing of new IO and networking functions. It brings Universal IO Extensibility to the Linux kernel and gives IO developers the ability to create applications, publish them, deploy them in live systems without having to recompile or reboot a full datacenter.

The project provides a programmable data plane and development tools to simplify the creation and sharing of dynamic "IO Modules". At its heart is IO Visor_Engine, which is a universal in-kernel IO Virtual Machine that provides runtime extensibility. IO Visor_Engine has a set of IO Visor_Plugins to provide functionality to different areas.

The Challenge

PLUMgrid, Inc., which provides SDN and NFV solutions for OpenStack and Container cloud providers, has participated in the open source community since the company was founded in 2011. It started working with the Linux kernel community to create a distributed, programmable data plane and contributed to eBPF (extended Berkeley Packet Filter), a key component in building networks that are agile, fast and secure. eBPF has been upstreamed since Linux kernel version 3.16.

Despite this considerable open source experience, when PLUMgrid engineers and managers began to initiate a formal open source IO Visor project in 2014, they weren't quite sure where to begin.

"We didn't know how to form a collaborative project," said Wendy Cartee, VP, Marketing & Project Management, PLUMgrid. "We weren't sure about the governance, or how the different committees required to properly run the community would come together. So there were a lot of unknowns for us."

The Approach

In 2015, the company turned to The Linux Foundation to help launch IO Visor, a Linux Foundation Project working on a set of open source IO and networking components that can be combined to build IO Modules for use in networking, security, tracing and other application functions in a datacenter. PLUMgrid's work is contributing to the rapid advancement and innovation in evolving areas including cloud computing, the Internet of Things (IoT), Software-Defined Networking (SDN) and Network Function Virtualization (NFV).

THE PATH TO IO VISOR

In the past, PLUMgrid's open source participation happened naturally due to their products aimed at OpenStack environments, Cartee said. PLUMgrid helps service providers and enterprises operationalize their OpenStack cloud virtual networks and SDN (Software Defined Networking) deployments with products such as Open Networking Suite (ONS) and CloudApex, its companion monitoring platform.

Currently, PLUMgrid has deployed over 70 OpenStack-based clouds providing Communications as a Service (CaaS), Platform as a Service (PaaS), E-Commerce, Media and Entertainment Cloud, for companies around the world.

In 2012 a group of PLUMgrid developers got involved in the Linux kernel community developing virtualization for I/O. "They were driven by the appeal of dynamic IO modules that could be loaded and unloaded at runtime — very compelling for virtualized environments," Cartee said. "Their involvement in the Linux kernel community and success in developing key technologies through that participation, led the company to discuss forming a community around IO Visor in early 2015."

Now a Gold member of The Linux Foundation and a Silver founding member of OpenDaylight, PLUMgrid has learned how best to leverage the foundation's pool of experience, including how to engage with developers and provide the tools they need in order to continue to innovate and drive contributions to the project.

The Results

By involving The Linux Foundation in formalizing the IO Visor project, PLUMgrid has been able to help coordinate all the work that is being developed by different companies in this space and raise awareness among developers to evangelize the mission and the goals of the project.

Being part of a collaborative project that resulted in seeing ideas turn into actual working code was particularly gratifying, Cartee added. "I think it's a new experience for most of us, who are used to the standards bodies of the past."

"Previously, activity was pretty much ad hoc, and there weren't any formal discussions," said Cartee. "There were a lot of contributions but it was a little more challenging to get more companies and communities to come together and talk about ideas, and prioritize use cases, talk about how various use cases can fit together, and talk about how other collaborative projects can come together and solve a much bigger problem. Formalizing the project really helped us advance the entire solution from that perspective."

Initially concerned that the governance model would be a lot of crossing "t's" and dotting "i's," the team was surprised at how lightweight the governance model really is. "It has really enabled the technical steering committee to drive the technology and discussion around solutions and use cases and propose how various companies can best work together," Cartee shared.

With a sound collaboration framework in place, a lot of ideas from member companies, frequent collaboration calls, and passionate developers blogging about what they are working on, the IO Visor project has seen a step function increase in interest in the community.

Perhaps the key to the project's quick success, is PLUMgrid's outreach in the open source community.

"We try to sponsor or attend as many Linux Foundation events as possible to help spread the message. We're finding we no longer have to explain what IO Visor is, because people already know, so then the conversation becomes about the technology, the roadmap and where the community is headed, rather than explaining what it is."

"For us it has been an extremely positive experience. By partnering with The Linux Foundation on governance, budgeting, marketing initiatives, and other aspects of running the community, we are able to run much more quickly than if we hadn't formed a collaborative project," Cartee said. "There's a much broader set of companies now becoming aware of the IO Visor project and who want to be part of contributing to it."

"Open source projects at The Linux Foundation are like gears, and by working together we've figured out how to fit all the different project gears together, then new ideas in one project drives all of the other projects forward as well. We can run faster together."

-Wendy Cartee, VP, Marketing & Project Management, PLUMgrid

For more information on IOVisor, visit www.iovisor.org.

To learn more about hosting your open source project at The Linux Foundation, please contact us at membership@linuxfoundation.org.

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