



LF NETWORKING

EMCO 

Case Study

Equinix taps infrastructure as code module from EMCO to simplify orchestration for customers

Digital infrastructure company applies DevOps model to composing and orchestrating physical infrastructure across multiple domains



EQUINIX

Overview: Swivel-chair orchestration

Equinix, the world's digital infrastructure company™, saw growing customer demand for multi-access edge computing (MEC infrastructure and resources). Most such opportunities were hybrid, with edge applications requiring services in one or more domains, such as the operator network edge, the public cloud edge and the public cloud core.

The business opportunity was compelling, but the technical complexity was daunting. Each domain presents its own APIs and provisioning methods, which made it difficult for Equinix to offer its customers easy-to-implement, end-to-end deployment.

"Our challenge is the complexity of doing this all manually" says Oleg Berzin, fellow, technology and architecture in office of the CTO at Equinix. "It becomes swivel-chair orchestration because of all the specialties involved. You need a specialist in provisioning public clouds, an edge cloud specialist to install the servers, a network specialist to connect them and a network provider to access them. On top of all that, you need expertise in installing your application on the server."

Working in the office of the CTO, Berzin's team began researching ways to simplify orchestration so that customers could purchase more connectivity services and edge-cloud capabilities from Equinix.

Initially, the team started development with ONAP, and later ultimately transitioned to [Edge Multi-Cluster Orchestrator \(EMCO\)](#).

“ Equinix provides connectivity, up to the front door of the cloud. With EMCO, because it's multi-domain, we expect we can expand our capabilities to reach past the front door into the cloud for configuration and application deployment beyond just the connectivity to it. We cannot get rid of the complexity, but we can use EMCO to make orchestration easier for our customers. By making it easier, we increase consumption of our services. ”

OLEG BERZIN, FELLOW, TECHNOLOGY AND ARCHITECTURE, OCTO, EQUINIX, INC.

EMCO: Lightweight, multi-cloud, container-based. And flexible.

EMCO is the Linux Foundation’s project (as part of the LF Networking umbrella) for connecting and deploying workloads across public clouds, private clouds and edge locations, with end-to-end communication among applications. The primary engineering resources for the project are from [Intel and Aarna Networks](#).

“We incubated EMCO within the ONAP project,” says Bob Monkman, networking open source strategist and director at Intel. “We saw the need in other Linux Foundation projects for lightweight, cloud-native deployment of applications and management of their lifecycle. We did some prototyping and incubation within ONAP, then built blueprints demonstrating an open, multi-cloud, Kubernetes-based orchestrator that became EMCO.”

Berzin’s team experimented with the EMCO package that Aarna Networks had assembled. They found it lighter in weight and faster than what they had built previously. It showed potential in other important areas like application deployment. What’s more, EMCO demonstrated flexibility.

“EMCO is written and architected in Kubernetes,” says Berzin, “and it’s the tool to orchestrate on top of Kubernetes. But we also discovered a flexibility in it to include things that go beyond Kubernetes in a modern and DevOps-oriented way.”

Working together with Aarna, Equinix took advantage of that flexibility. They integrated other pieces so that, with a few clicks, customers could see and enable infrastructure uniformly across domains, then deploy applications on top of it.

Infrastructure as code, or “the orchestrator becomes like a CPU”

From the perspective of implementation, Berzin believes that the biggest, industry-wide challenge is to present infrastructure uniformly. Clouds have no common formats or standards, nor much incentive to agree on any. Carriers have standards, but implementation varies widely. So, the first project on which Equinix collaborated with Aarna was to add a module to EMCO enabling infrastructure as code.

“EMCO is capable of integrating tools like Terraform,” says Berzin. “Terraform is a tool that describes

infrastructure — both cloud and edge resources — as code. It generates human-readable configuration files that you can version, use and share. Next, you can create workflow for every point in the lifecycle, like configuring a virtual private cloud or creating a subnet. Then, you can use it to manage low-level components like servers and high-level components like DNS features. Because EMCO can integrate infrastructure as code, the orchestrator becomes like a CPU. It retrieves the code and data it needs, then executes it, all without the overhead of maintaining a model.”

Most important, this is a DevOps-driven approach to infrastructure orchestration, allowing Equinix customers to build and adjust physical and virtual infrastructure quickly.

The future: Intent-based enablement

Intel’s Monkman sees potential value in EMCO for most organizations — private enterprises, cloud service providers, telcos — trying to deploy and manage Kubernetes-based applications or network functions. They can use EMCO to orchestrate those applications and manage them across disparate clouds.

“EMCO abstracts a lot of the complexity of provisioning, security and networking,” he says. “Plus, it provides the automation needed for one-click deployment of workloads across edge cloud locations. In addition, we have identified use cases where EMCO can fit into an end-to-end orchestration and management architecture with the ONAP project. We are exploring the cross community collaboration opportunities there now, within the 5G Super Blueprint initiative.”

For Berzin, this infrastructure-as-code project is the first phase of simplifying service delivery. He’s pleased at going beyond the basic capabilities of EMCO and demonstrating how Equinix customers can compose and orchestrate infrastructure. He envisions an infrastructure design studio offered as a service.

“It sounds crazy,” he says, “but the big lesson for me is that we can now think of composing and orchestrating physical infrastructure as if it were software. Infrastructure-as-code is becoming the most popular way of configuring resources. EMCO helps us make it look as though it’s driven by intelligent workflow, all the way up to intent-based infrastructure enablement. Network architects want to be able to say, ‘I want this cloud, that edge, those connections and this network,’ and see it happen, and I think that’s where we’re headed. I can see that shift coming already.”