Containers and microservices–making manufacturing agile

Critical manufacturing
an ASMPT company

Critical Manufacturing's MES solution is at the heart of the shop floor for many manufacturing firms, particularly in complex industries such as electronics, semiconductors, and medical devices. When Critical Manufacturing adopted a new strategy to optimize how MES software is developed and delivered to customers, containers were a foundational requirement. Red Hat® OpenShift® has allowed Critical Manufacturing to accelerate development with a simple delivery mechanism. Whether providing its solution to a new customer or delivering new features to existing customers, deployment is consistent and streamlined for all environments—on-premise or in the cloud.

Question: How are containers helping you accelerate innovation?

Adelio Fernandes, VP Engineering at Critical Manufacturing: Containers allow us to accelerate and automate how we develop our software and how we deliver it to our customers. Containers are providing us with a continuous integration, continuous deployment (CI/CD) pipeline that is aligned with our vision of having a developer just write code, commit it, and then the software ships to our customers —automatically conducting the checks and distributing it. This helps us focus on building and optimizing our internal pipelines to ship software faster and reduce costs. We deploy environments every day so our validation and product management teams access the current features we are developing, daily— ultimately, accelerating how we ship software.

Previously, shipping a new component was very difficult. We needed to convince our customers that the new capability warranted their attention, and some customers could not adopt the new technology —whether for technical, compliance, strategic, or other reasons. For product development, that manual process had a lot of constraints but when using containers, we abstract the process and automate it, so customers just focus on the lower layers of their infrastructure—the bare metal, virtual machines, or whatever environment they choose to run their container platform on. Of course, they must first adopt a container platform; that will mean a one-time disruption. After that, any new technology we select to use within our solutions will be automatically integrated and alleviates the historic burden for our customers.

Red Hat Innovators in the Open

About Red Hat Innovators in the Open

Innovation is the core of open source. Red Hat customers use open source technologies to change not only their own organizations, but also entire industries and markets. Red Hat Innovators in the Open proudly showcases how our customers use enterprise open source solutions to solve their toughest business challenges. Want to share your story? Learn more.

Question: How else are containers helping your customers?

Fernandes: Our customers typically use our software on-premise, although more are looking to the cloud. Their software is typically deployed within application services. To scale an application, they needed more servers and needed to repeat manual steps to set up and configure the servers and then install our software across these servers. And now, with containers, they can deploy as many instances as they want, and everything is automated.

Containers also allow them to deploy our software transparently, whether on premise or cloud infrastructure. They can deploy and update the systems or upgrade to newer versions from a distance with a click, regardless of where they are running their software.

Question: Why did you select Kubernetes as your container platform?

Fernandes: We wanted to eliminate dependency on the host operating system, so we decided on Linux® containers. Added to that, an open source solution allows for flexibility because there are a lot of components already built that you can select and use for your own solutions without reinventing the wheel. And open source would not add cost for our customers or for us.

Why Kubernetes? When you talk about containers, Kubernetes is the most powerful solution. It does, however, come with some complexity; maintaining it is not easy. There are other less complex alternatives, but companies tend to only use them for development environments. Our customers are large, production enterprises, and we needed to find a container approach that would work for them all —and that led us to Kubernetes. And Kubernetes would mean the way we deploy Critical Manufacturing MES software would be consistent—the same whether they are on-premise or in the cloud, be it private, public, or hybrid.

Question: Why Red Hat OpenShift?

Fernandes: A potential customer was discussing using Critical Manufacturing MES on Red Hat OpenShift with Red Hat and us. From those discussions, we realized that Red Hat OpenShift aligns with our strategy for making the deployment of our MES software transparent, automating our CI/CD process, addressing our open source and Kubernetes container needs, and providing us with enterprise-level support, for any deployment location. We saw how committed Red Hat is to its customers.

So, we adapted and certified our product to run on Red Hat OpenShift. That prospect became a customer, adopting Critical Manufacturing MES running on top of Red Hat OpenShift. Certification increases our technical credibility with our customers because it answers many of the security concerns our customers typically have regarding containers.

Question: How else is Red Hat OpenShift simplifying tasks—for you and for your customers?

Fernandes: Red Hat OpenShift gives us a pipeline to deploy to all our customers. We need to be able to deploy to all different scenarios, regardless of whether it is Red Hat OpenShift or a completely different container platform.

For our customers, Red Hat OpenShift means they only have to take care of the lower layers of the infrastructure. They provide the bare metal, virtual servers, or cloud, Red Hat abstracts the infrastructure layer, and the Critical Manufacturing MES runs on top. Red Hat OpenShift's cluster management, for instance, controls clusters and applications from a single console, with built-in security policies, which is very important because setting up a Kubernetes cluster can be complex. Red Hat OpenShift has the same user experience and the same functionality as Kubernetes but makes cluster management easier.

We now recommend Red Hat OpenShift to our customers, especially the ones that do not have the skills or experience to run Kubernetes but who still want to accelerate and simplify their application development experience.

Question: What's next for Critical Manufacturing?

Fernandes: As part of our solution, we will have an IoT data platform where customers deal with huge volumes of data. The ability to grow and shrink clusters as needed is something that will avoid unplanned downtime. Customers using Red Hat OpenShift will be more prepared for demand-related changes and will be better equipped to address it.

About Critical Manufacturing

Critical Manufacturing is a subsidiary of ASMPT. It was founded in 2009 and is focused on providing manufacturing software for high-tech industries, such as medical devices, electronics and semiconductors. It has offices in Portugal, USA, Germany and China.

About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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