

# Supporting the modern software factory is transforming CA Technologies

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# Ovum view

# Summary

The move to cloud computing is creating a new and more diverse operating environment that CIOs must manage. This move involves more than just where the computing takes place and includes shifting the mindset from a physical infrastructure-based paradigm to a more shared services application-centric approach. The challenge is that the current set of management tools and processes were designed for siloed infrastructure-based operations and a waterfall development era where development and operations were separate entities with completely different objectives, with development aiming to change the business and operations trying to ensure stability and reliability. While these two are not mutually exclusive, the old siloed mentality did little to foster collective responsibility and collaboration. The move to cloud and an application-centric environment has meant that a new set of tools and processes are needed to manage technology. DevOps is the term used to define this new way of working, but there is a lack of skills in the new technologies making adoption of these slower than anticipated. CA Technologies has evolved and innovated, pivoting itself to form a bridge between the old and new operating paradigms.

# CA Accelerator has two new container-focused solutions

CA Accelerator is an internal software incubator program, fostering innovation by creating an entrepreneurial culture. Two of the new start-ups that are being supported focus on container management and monitoring. Ovum believes that containers/microservices, also known as cloud-native, represent the future of organizational IT in terms of how it will be architected. However, organizations will be in a transition period from legacy to cloud-native for many years and will require management tools that help them with managing both these different environments with a single team. The CA Technologies start-ups Yipee.io and FreshTracks.io are looking to solve the management challenges of the future before most organizations realize they even have them. While these new start-ups are not directly connected to existing CA Technologies products, they are being developed with a realization that to become adopted, any solution to solve a new challenge must also work with existing tools. The CA Accelerator program does not expect the innovations to integrate directly with existing code-based solutions, but instead to evolve a new approach rooted in the engineering ethos of the company, so if it is successful, any start-up can be delivered as an integrated CA Technologies solution.

# You cannot manage what you cannot see

One of the questions often asked by clients about containers/microservices regards how to know what is working and if it is working as it was developed. The most common monitoring deployment is using Prometheus on a Kubernetes environment. Prometheus is an open-source system-monitoring and alerting toolkit, and Prometheus joined the Cloud Native Computing Foundation in 2016 as the second hosted project, after Kubernetes. Prometheus's main feature is its ability to build a multidimensional data model with time series data identified by the metric label, using a flexible query language to externalize this information. However, this approach is a reactive way to monitor a container-based environment and does not make use of any AI or machine learning technology. FreshTracks.io

on top of Prometheus by gathering operational topology and orchestration events to add to context and operational insights to the existing time series data sets.

# Why managing containers requires a new approach to reduce complexity

To understand why managing in a cloud-native, or container-based, environment is different from the current approach, users need to understand the key differences between managing VMs and containers. A Linux container is a set of processes that are isolated from the rest of the system, running from a distinct image that provides all files necessary to support the processes. This approach makes containers a portable and consistent way of moving an application between different environments, such as from development to testing, or from one production environment to another. Containers share the same operating system kernel and isolate the application processes from the rest of the system. Containers come in several different forms, but the most popular is Docker, and the Docker platform enables the automated deployment of applications composed of portable containers that are independent of hardware, host operating system, and language. Unlike VMs, containers do not include a guest operating system but share the operating system with other containers.

The key difference from a management perspective is that in a containers world, the development and management of applications are very closely linked. For example, if you are developing an application, this could be on a personal or work laptop, and the environment will have a specific configuration, while other developers may have slightly different configurations. The application being developed relies on the configuration and is dependent on specific files. Therefore, as the application moves from development to testing, it crosses from many different configurations to standardized environment configurations with their own set of supporting files. This point of intersection between the freelance development world and the standardized operational world is where conflict can occur.

Making the application work across these different environments, complying with any corporate quality assurance, requires a new set of tools that avoid the need for rewriting or break-fixing any code. The answer is to have a platform that can accommodate the different configurations, such as Docker, which uses resource isolation features of the Linux kernel (cgroups and kernel namespaces) to allow independent containers to run within a single Linux instance. This approach avoids the overhead of starting virtual machines because Docker containers are significantly smaller and lighter in weight. Docker-based applications are assembled from containers that hold all the necessary configurations (and files), therefore enabling the applications to move from development, to test, to production without any nasty side effects.

The impact on management comes as the number of containers used in applications increases and a container orchestration tool is needed, such as Kubernetes or Docker Swarm. These orchestration tools are declarative and use YAML to define the environment. While this approach removes the complexities of using the command line to control these different containers, it (YAML) is a rigid language and it requires time for IT staff to become competent. In addition, despite using YAML for syntax, the configuration semantics are different for each orchestration tool. What is needed therefore is a tool that can simplify the definition of Docker-based applications and reduce the complexity of orchestration. Yipee.io is a graphical tool that enables the operator to visually compose an application's architecture, including services, networks, container dependencies, storage volumes,

scale, and associated properties. This reduces the learning curve for IT staff and enables the deployment and management of containers to be simplified.

# Appendix

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# **Ovum Consulting**

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at <u>consulting@ovum.com</u>.

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