The Definitive Guide to Container Platforms

AUGUST 2018

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Disruption and Change Drive Digital Innovation

Today's economy is one of constant change. New opportunities, competitors and risks emerge regularly. Everywhere we look, there are examples like this one:

> Banks and credit card companies have traditionally dominated payments. From PayPal to Venmo and Square, the payment industry is changing rapidly -- so much so that major banks launched Zelle, their own P2P payment service in the fall of 2017.

To stay competitive and capitalize on new opportunities in the digital economy, every organization needs to shift to an agile and innovative mindset. That means rethinking how companies operate, changing processes and systems that may have been in place for decades.

"In a world where we can't predict the future and new competitors can come from many directions, we will win by being able to embrace change and reconfigure our priorities in real time."

- James McGlennon, EVP and CIO at Liberty Mutual Insurance

However, this is where most organizations get stuck. Monolithic systems, siloed infrastructure and fragmented processes that have developed over the years make innovation and change difficult. How can companies overcome the barriers to innovation?

Containerization ≠ Innovation

Docker containers exploded onto the scene in 2013 as a better way to develop software and has quickly become part of the enterprise infrastructure. Organizations often start by containerizing applications -- either components of a monolithic application or new distributed applications. But containerization itself isn't enough to become more innovative. It requires changing processes, culture and the overall organizational mindset. That makes a container platform essential to success.

In this paper, we will discuss what a container platform is and why it's a critical part of any effort to drive change and innovation in the digital economy.

What is a Container?

A Docker container is a lightweight, standalone executable package that contains everything it needs to run: code, runtime, system tools, system libraries – anything you can install on a server. By encapsulating and isolating everything in a container, this guarantees that the container will always run the same, regardless of the environment it is running in.

Containers can uniquely turn very diverse set of application services into standardized software units. Docker containers remove the dependencies between applications and their underlying infrastructure, providing new possibilities in portability and efficiency.

Containers are promising because they eliminate the dependencies between applications and infrastructure -- but they're just a technology. Just like a hypervisor needs a layer of management around to be useful in the enterprise, containers need a platform to be truly effective at scale.
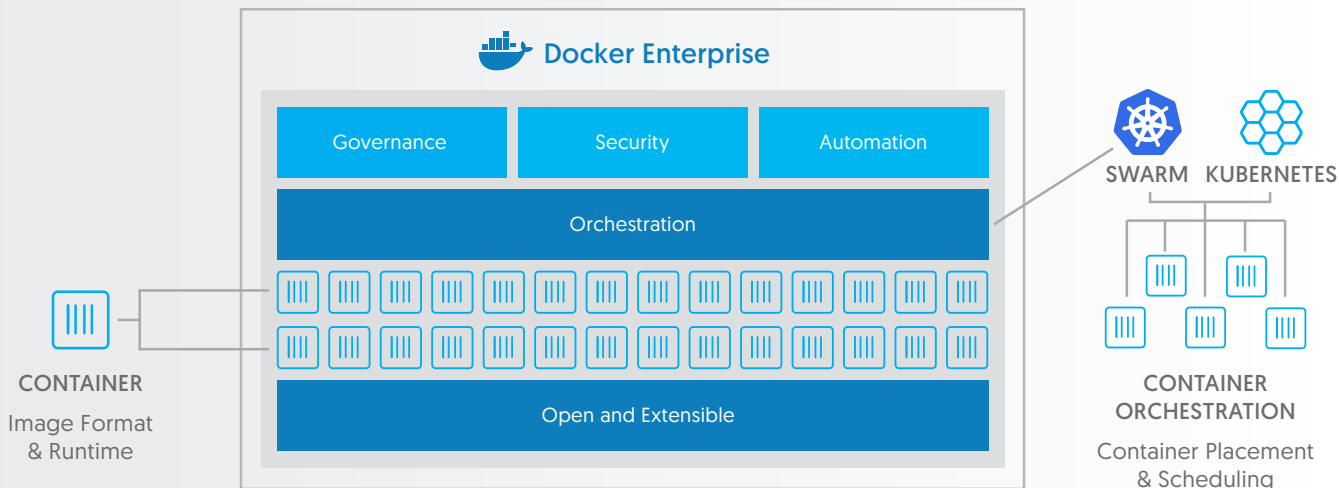
Just like a hypervisor needs a layer of management around to be useful in the enterprise, **containers need a platform to be truly effective at scale.**

Docker Enterprise

Governance | Security | Automation

Orchestration

Open and Extensible

SWARM   KUBERNETES

CONTAINER
Image Format & Runtime

CONTAINER ORCHESTRATION
Container Placement & Scheduling

What is a Container Platform?

It's a platform to build, secure and manage containerized applications in an enterprise environment. It's more than just containers with orchestration and provisioning capability. A container platform can support secure software distribution, application lifecycle management, automation, and governance. It opens up opportunities to transform organizations.

The End Goal: Accelerate Innovation by Turning Disruption into Opportunity

Agile organizations can innovate successfully, but it doesn't happen overnight. It often means cultural change, and a team whose job it is to break the rules. This can work even in traditional industries.

For example, when you think of mortgage companies, you think of paperwork. You probably don't think agile and responsive to customers. But Franklin American Mortgage wanted to disrupt that model. They created an innovation team to explore what was possible. The team quickly realized they needed a platform that would let them develop and iterate on new ideas quickly, then take them into production.

With their investments in innovation, microservices and Docker Enterprise, they've been able to quickly build a technology platform that is core to their success.

Lockheed Martin has a similar i2 Labs group that takes new technologies into production using the Docker Enterprise container platform. The flexibility and security of the platform allowed them to quickly deploy an augmented reality application to field maintenance teams.

Baker Hughes, a GE Company, services the oil and gas industry. The data science and analytics team deployed a Docker Enterprise container platform to give them choice and flexibility in infrastructure. They eliminated IT dependencies and accelerated delivery of new services to customers.

By investing in a container platform, organizations will be in a much better position to:

- Create new solutions that can in turn generate new revenue
- Grow and expand into new markets
- Reduce the cost and risks associated with existing infrastructure
- Streamline and speed up the entire software supply chain
- Adopt a DevOps culture with an agile methodology

Organizations can proclaim they have an innovative, agile culture. But without a platform that supports agility, those are empty words.

Franklin American
MORTGAGE COMPANY

FRANKLIN AMERICAN WANTED TO DISRUPT A TRADITIONAL BUSINESS

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Requirements for a Container Platform

A container platform should be designed to support innovation. Just as importantly, it needs to support existing traditional applications. Beyond that, it has to provide for corporate policies for security, change control, lifecycle management and more. This is what to look for in a container platform:

- **Integrated image management** that allows users to manage images and the content in them securely.

- **Governance** with role-based access controls to support multi-tenancy and a process for moving applications from development to test to production.

- **Automation** that allows administrators to set policies once that can then operate without active intervention or management.

- **Lifecycle management** that is integrated into the software development and CI/CD tools and processes from application development through retirement.

- **Layered security** around the application with image signing to assure security throughout the application lifecycle.

- **Extensibility** that connects the container platform easily into other enterprise tools including preferred storage and networking solutions, logging and monitoring tools.

- **Enterprise support and services** with advisory capability to help resolve potentially complex process, orchestration, integration and workflow challenges.

- **Certification** to assure interoperability with the ecosystem and other data center platforms.

Prepare Your Organization for Disruption

GENERATE NEW REVENUE STREAMS

Build New Solutions

Expand to New Markets

REDUCE COSTS AND RISK

Quickly Respond to New Threats

Drive Higher Efficiencies

Benefits of a Container Platform

Beyond buzzwords such as innovation and transformation, a container platform has tangible benefits:

- **Unified operations.** When everything is standardized and follows the same operational patterns, it's easier for IT teams to explore new technology areas -- and for the company to adapt and embrace new services. Franklin American runs a single cluster that supports the development, test and production environments.

- **Leverage existing teams and processes.** This goes back to standardization. With a common platform, processes become repeatable. It's easier and faster to experiment or just make iterative changes.

- **Respond to risks and threats.** The agility and standardization offered by a container platform makes it easier to apply consistent security to protect the organization from threats.

- **Increase data center utilization by 3x**. Even with virtualization, most data centers operate at 20 percent utilization -- at best. Containerization increases utilization 50 or 60 percent by eliminating redundant operating systems and further consolidating services.

- **Decrease IT operating costs.** Lifecycle management and infrastructure standardization make system patching, application updates and even rollbacks much faster. Cornell University accelerated application deployment times by 14x; Kadaster, the Dutch land registry, went from one new deployment a month to as many as 500.

- **Fund innovation.** As a Fortune 100 insurance company put it in their DockerCon presentation, companies can "self-fund innovation" since the savings from a container platform can get reinvested in innovation.

Driving Successful Innovation with a Container Platform

Very few technologies have had the potential to unlock innovation in the same way as container platforms. Successful innovation requires:

- **Full pipeline integration in the platform.** Containers shouldn't be a side project. To drive innovation, they need to be an integral part of the software pipeline. In fact, containerization and a container platform should reshape how organizations think about software development.

- **Security and governance throughout the platform**. A container engine by itself doesn't provide this, and it makes little sense for IT to try and cobble together what they need from various tools. It should be part of the platform to begin with.

- **A commitment to people and process.** People are a critical part of successful innovation. That's why Franklin American, PayPal, Lockheed Martin and others created innovation teams that could operate outside of the regular constraints -- and spread an innovation mindset throughout the company.

Stages of Container Maturity

Since Docker was founded in 2013, companies have been adopting containers in a few different ways. Initially, it was developers who leveraged containers for local development. Then these applications made it to production. Now organizations are leveraging containers to modernize their traditional applications and using them across multiple applications. What's the right way to deploy containers successfully? When is the right time to adopt a container platform? The answer depends on the level of impact you wish to have on an organization.

1. DEPLOY A CONTAINER ENGINE ONLY

Organizations that are just beginning to experiment with container technology. It might just be deployed by one or two users, or perhaps used for a single application in a development and test environment. About 50 percent of organizations we surveyed recently are in this early phase.

Build up knowledge about containerization within a core team. This is useful, but provides no immediate broader value to the organization and doesn't support a business case for expansion.

2. ORCHESTRATED CONTAINERS

Customers are running one or more clusters with containerized applications. These are usually managed by a single IT team supporting a specific department or use case. About 30 percent of organizations surveyed on a recent Docker webinar have adopted container orchestration.

Orchestration makes for much easier patching and maintenance, and faster deployment of containerized applications, but this environment is only suitable for a single set of users or applications. What orchestration doesn't address is the needs across an enterprise organization. As a result, the benefits of containerization are only felt by those directly using it.

3. CONTAINER PLATFORM WITH INTEGRATED PROCESSES

Organizations that have standardized on containerization and integrated containers with existing workflows and systems. They often redesign processes to better support containerization. About 15 percent of organizations we surveyed are using container technology are at this stage.

Companies at this stage see significant cost savings and are able to ship software more frequently, which begins to change the culture and behavior within an organization.
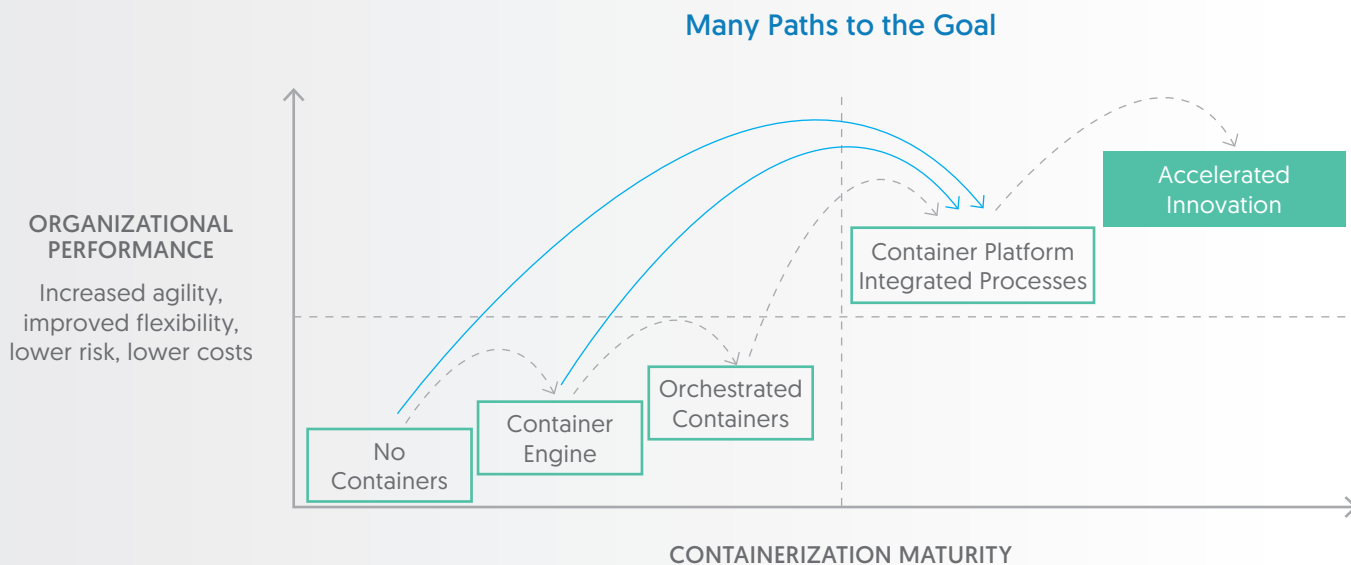
4. ACCELERATED INNOVATION

Organizations that have a fully mature container platform that is integrated into the organization's people, process and tools. They have a "containers first" mentality and recognize the advantages of standardizing around Docker containers.

Organizations at this stage can easily adapt to new technology, leveraging existing operational teams and processes and lowering the cost of entry. New technologies are automatically secured based on corporate policies with automation and governance built-in, reducing time-to-market and providing organizations a competitive advantage.

The Path Isn't Necessarily Linear

Many organizations start by experimenting with a container engine and follow a slow path to accelerated innovation. But in today's world of constant change and disruption, is that sufficient?

It's entirely possible for organizations to jump quickly from proof-of-concept to a container platform. PayPal, Lockheed Martin, Franklin American Mortgage and many others have created independent innovation teams to spark change and bring new platforms into production.

Many Paths to the Goal

ORGANIZATIONAL PERFORMANCE

Increased agility, improved flexibility, lower risk, lower costs

Accelerated Innovation

Container Platform Integrated Processes

Orchestrated Containers

Container Engine

No Containers

CONTAINERIZATION MATURITY

To progress towards accelerated innovation -- whether it's a leap ahead from no container strategy at all to a fully-integrated platform or gradual progress on the path -- it takes three things:

- Strong support for innovation and change - usually a dedicated innovation team of some kind.
- A complete container platform, integrated into the organization's processes.
- Enterprise support and training to make sure the organization gets the most out of the investment.

The Docker Enterprise Container Platform

A container engine -- even when it's paired with orchestration -- is just not enough for enterprise-scale operations and major innovation initiatives. Organizations need a complete solution starting with a complete platform. Docker Enterprise is that platform.

Docker's platform is built on the three principles of **Choice, Agility and Security**:

Docker Enterprise Unlocks the Potential for Innovation

Choice	Agility	Security
• No lock-in • Any stack, any OS • Any infrastructure anywhere • Integrates with any tool	• Real-time innovation • Seamless collaboration • Productivity and operational efficiency • Cost savings	• Applications and data • Software supply chain • Pervasive across the platform from core to edge

Freedom of choice: The Docker container platform eliminates risk for IT leaders by providing the freedom to choose how, when and where to innovate their applications without the fear of technology or infrastructure lock-in. Organizations can start big or small, with legacy or new applications, using any operational model, on any OS, across any infrastructure, whether it be on prem or across multiple clouds and still have the same Docker experience throughout the application delivery process. Because the platform is built with flexibility in mind, the choice today will provide organizations the flexibility to support future innovation.

Agile Operations: Docker Enterprise enables organizations to reduce costs and increase operational efficiency by standardizing the way to build, manage, and secure applications across diverse infrastructures including multiple clouds. Our platform unifies processes across any architecture, while aligning with existing IT operations so organizations can get applications to market faster, reduce total costs and ease the adoption of new technology as business needs evolve over time.

Integrated Security: Our platform incorporates additional security at every step of the application delivery lifecycle without getting in your way or adding extra cost. Applications receive greater protection while maintaining performance, improving governance with enabling a seamless workflow for centrally-managed content and policy-driven automation.

In addition, Docker provides **Support & Certification** that lets organizations avoid the uncertainty and steep learning curve of standalone container engines. Customers have access to enterprise support, on-boarding services, training, workshops, and technical certification programs.

These capabilities in a container platform are essential for enterprise scale operations. The walkaway point for an executive should be:

> "I would be fired if I didn't ensure that our operations included these benefits. Security is table stakes. Governance ensures the team works on the right things, delivers with the right processes, and protects the company at every step. Automation is critical to avoid simply transferring all your labor savings into manual processes. And of course, responsive support to keep the team productive."

Taking the Next Steps

What organizations should do next depends on where they are now, and what they want to achieve.

- **For organizations that have not started on the containerization journey:** Identify a first project. Show early success with an application and begin planning an innovation team.

- **For organizations that have not have just deployed a container engine for a single application:** Found an innovation team to explore what else is possible. Invite other teams to provide input. Find out what they need. It's possible to go from a very limited pilot to a platform by identifying opportunities where containerization can have a big impact.

- **For organizations that are up and running with container orchestration:** If there isn't an innovation initiative, now is the time to start one. Take the early success to other parts of the organization. Invest in training and certification to make sure teams know how to get the most out of a container platform.

To learn more, watch the [Docker webinar](#) on Delivering Innovation and Value.

www.docker.com