APPRENDA

KUBERNETES IS THE STANDARD FOR CONTAINER ORCHESTRATION

No matter the data source, Kubernetes is the clear leader in cloud-native orchestration platforms among CIOs, operations and developers alike. As has been learned from past vendor efforts to do so, no one can buy the network effect. All the data points to Kubernetes and containers (Docker, rkt) as having this network effect. Kubernetes' momentum, market maturity and usage is not matched by any comparable solution as the data of its first year in general availability (captured below) makes clear.

In One Year

7,110
Kubernetes News Articles

4,635
Kubernetes Professionals

779
Kubernetes Jobs

GITHUB

32,113
COMMITS

140
RELEASES

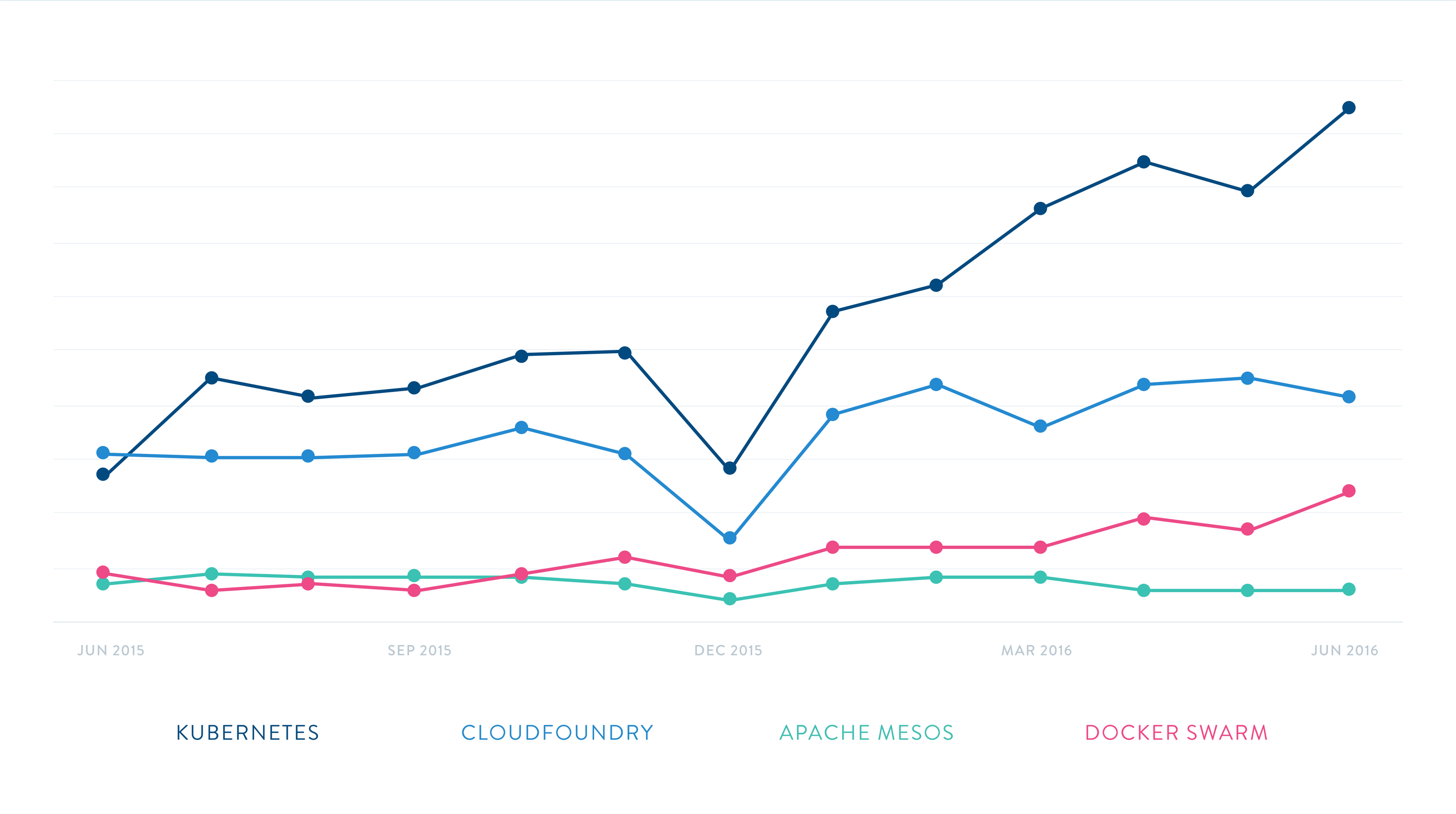
825
CONTRIBUTORS

TOP 100
FORKED GITHUB PROJECT

TOP 2
STARRED GO PROJECT

TOP .01%
STARRED GITHUB PROJECT

WEB SEARCH INTEREST



How Organizations Leverage Kubernetes

- Component for self-service distributed cloud platform - i.e. a DIY enterprise PaaS
- Hosting of off-the-shelf applications and frameworks supported by Kubernetes
- Container hosting and orchestration that is managed by operations (not self-service)
- Multicloud orchestration

	KUBERNETES	MESOS/MARATHON	DOCKER SWARM	CLOUD FOUNDRY
FOUNDATION	Cloud Native Computing Foundation (part of Linux Foundation)	Apache	None	Cloud Foundry Foundation
SOFTWARE VENDORS (PRODUCT NAME)	Apprenda (Kismatic), CoreOS (Tectonic), Engine Yard (Deis), Red Hat (OpenShift)*, Mesosphere (DCOS)*, Rancher Labs (Rancher)* *Kubernetes is a component of a larger product	Mesosphere (DCOS)	Docker Inc (Swarm)	Pivotal (PCF), HPE (Helion)
PUBLIC CLOUD SERVICE PROVIDERS	Google Container Engine, Red Hat OpenShift, and many more currently in development.	A number of public cloud providers, including Azure, use Mesos as part of its underling architecture.	Azure	IBM, Predix (GE's IoT PaaS)
USE-CASES	• Component for self-service distributed cloud platform - i.e. a DIY enterprise PaaS • Container hosting and orchestration that is managed by operations (not self-service) • Multicloud orchestration • Hosting of off-the-shelf applications and frameworks supported by Kubernetes	• Component for self-service distributed cloud platform - i.e. a DIY enterprise PaaS • Container hosting and orchestration that is managed by operations (not self-service) • Multicloud orchestration • To host Big Data (Spark) frameworks that were purpose built for Mesos	• Component for self-service distributed cloud platform - i.e. a DIY enterprise PaaS • Container hosting and orchestration that is managed by operations (not self-service) • Multicloud orchestration • Host applications and frameworks specifically built for Docker Swarm	• Off-the-shelf self-service distributed cloud platform • Multicloud orchestration
YEARS RELEASED	1+	7+	1+	5+
COMMUNITY	• Extremely large and diverse • One of the top projects on GitHub (0.01% in terms of starred and #1 in terms of activity) • Large Slack and Stackoverflow community for support and collaboration • More professionals list Kubernetes on their LinkedIn profiles than any other comparable solution • Large number of vendors and providers hedges against lock-in	Mesos has a community of a few vendors and some key end-users. Mesosphere, who also sells the product, is top contributor.	Most of the Swarm contributions come from Docker.	Most of the Cloud Foundry contributions come from Pivotal and IBM.
BUSINESS MODEL	Like Hadoop, Kubernetes was orginally developed from a project used internally at a large tech company that was open source for other vendors, not associated with original project, to productize into commerical software. Google has stated that it has no plans to offer a commercially supported and installable version of Kubernetes.	Mesos is productized and sold by creators of the project, Mesosphere.	Docker Swarm is productized and sold by creators of the project, Docker.	Cloud Foundry is productized and mostly sold by the creators of the project, Pivotal. HPE also has an installable version of Cloud Foundry but the vast majority of revenue goes to Pivotal, and HPE has since abandoned its Cloud Foundry-based public cloud and invested more heavily in Kubernetes, which power HPE's cloud, and Mesosphere (led $73.5 million Series C round).
STRENGTHS	• 10 years of Google research and development in containers and orchestration • Clear Market Leader: Largest adoption and interest amongst developers and the enterprise • By far the largest community actively contributing to projects of any comparable solution • Strong number of options for productized version • High availability of persistent storage • Growing number of service options from top public cloud providers • Large practices from system integrators built around Kubernetes	• Used by a few large organizations at massive scale (e.g. Twitter) • Interest from large financial institutions and public cloud providers • Proven history supporting large number of nodes at Twitter • Spark, a Mesos framework, is seeing traction in the Big Data market • Mostly controlled by single vendor who can decide product direction • Single throat to choke for features and roadmap	• Docker owns the current standard for containers • Docker Inc is immensly popular. Dockercon has over 5K attendees • Mostly controlled by a single vendor who can decide product direction • Single throat to choke for features and roadmap	• Cloud Foundry has been around for a number of years • Decent documentation that has gone through many renditions • Large practices around Cloud Foundry have been built by system integrators • Single throat to choke for features and roadmap
WEAKNESSES	• Documentation • No Windows Server support (active area of development with early 2017 expected release) • No single throat to choke on the OSS project (requires a distribution or active participating) • Most organizations will need commerically supported Kubernetes due to complexity of maintenance and installation • Kubernetes is a mature solution but its relative age and rapid growth means that the Kubernetes version you can get at some future date will have many more features	• Mesos strength is in Big Data and analytics and not container orchestration • Not as much traction among developers • Complexity - does too much and is too generic - needs frameworks for most use cases • Championed by single vendor	• Weak pulse on GitHub with smaller number of contributors and commits than other similar projects • Only available from Docker Inc • Little traction from developers • More aimed at developers than central IT • Uses Docker APIs, which means has compatibility with the container but limits functionality for enterprise IT use case	• Built on concepts from public PaaS and shares many of the now outdated, and little used, concepts like Buildpacks • Monolithic cloud platform not ideal for DIY projects or those that want best of breed individual tools • Lock-in to single vendor is strong possibility given Pivotal's dominance in the market and Cloud Foundry's monolithic platform where services only work with other Cloud Foundry services
OPPORTUNITIES	• Expand to multiple data center / multicloud deployments use case- i.e. the Ubernetes project • Because of the Hadoop business model, Kubernetes is going to be adopted by more vendors and providers that will productize and make new services • Kubernetes momentum and lead can transition into a true de-facto standard in the orchestration space that is similar to Linux in the OSS enterprise operating system market	• Mesos frameworks for the Big Data market • Mesos can become a general resource management solution for COTS and other solutions that don't yet work on Kubernetes	• Docker containers are popular and Docker Inc can use that momentum to drive other projects such as Swarm and newer Swarmkit • Docker Inc can leverage its brand to land big partnerships and go-to-market opportunities with large vendors that can distribute new solutions	• Large financial backing by Dell/ EMC Foundation and others • Cloud Foundry can disagregate its solution and choose best of breed container orchestration and other solutions • Appliance market
THREATS	• Kubernetes uses Docker Inc's container format as a default, but Docker Inc has its own plans for the container orchestration space • Kubernetes is relatively complex; customers going the DIY route may need to seek professional services or Kubernetes distributions • The community has grown extremely fast and is managing a huge mono-repo on GitHub (something that site was not originally designed to do)	• Kubernetes has become much more popular than Marathon on Mesos • The complexity of maintaining Mesos and all its frameworks on a single product means Mesosphere is commiting to a lot and may spread too thin • Some of Mesosphere's main backers have already hedged their bets by also adopting Swarm and Kubernetes. There is no single force, besides Mesosphere, pushing only Mesos now • Mesos main backer, Mesosphere, has raised a lot of money in a very short period of time and now needs to justify and grow into a high valuation	• Kubernetes and Mesos are currently more popular in the enterprise • It is yet to be determined if Docker Inc can transition its popular brand to tools beyond its container • Docker Inc has raised a lot of funding in a very short period of time and needs to grow into a high valuation	• DIY cloud platform projects can now be built with best of breed services and tools (Docker containers, Kubernetes orchestration, etc.). Pivotal already sees newer solutions as a competitive threat • Monolithic PaaS has become less popular with time • Pivotal Cloud Foundry is often installed as a CTO initiative to "satisfy developers", but most of these developers have never actually used Cloud Foundry