Red Hat

Red Hat is a leader in multicloud container development solutions

The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020

Businesses today must have the skills and tools to build and support an application portfolio that supports evolving customer demands. The purpose of a container-centric, application developer platform is to allow developers, operators, and security teams to have consistency in any environment, while still being able to tap into the innovation of cloud and its supporting ecosystems. One of the key differentiations of Red Hat OpenShift is that from inception, OpenShift can fit into environments like yours, since it builds on over two decades of deployment history of Red Hat Enterprise Linux. Other Kubernetes offerings started as a feature to their primary offering (e.g., cloud or virtualization software) and have limited experience in other environments. Red Hat continues to be a leader in contributing and maturing the open source communities in the cloud native ecosystem. As noted in The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020, "OpenShift is the most widely deployed multicloud container platform and boasts powerful development and unified operations experiences across many public and on-premises platforms".

A PLATFORM TO ACCELERATE INNOVATION

Can software help reduce barriers and friction between groups? DevSecOps is a cultural movement that can be supported by good tooling where each group can have access to what they need in a common environment. Developers want to focus on their code, not the infrastructure. Operations teams are embracing automation and look to make infrastructure invisible. Security must be involved from the beginning and integrated into the workflow. Red Hat OpenShift is much more than Kubernetes alone, the platform curates and integrates dozens of open source projects enabling support for your changing application portfolio including traditional applications, microservices, artificial intelligence and machine learning, and functions. With Red Hat's OpenShift architecture, your team can spend less time on building and maintaining the platform, and more time on your business priorities. Taken one step further, many customers are turning to managed cloud services where the platform is managed by vendors and consumed as a service; Red Hat offers this across multiple dimensions: on-premises vs public cloud, self-managed by the customer and OpenShift as a service managed by Red Hat and its partners, and multiple platforms including AWS, Azure, GCP, and IBM Cloud environments.

For more thoughts from Red Hat on The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020 report, click here for a short video.

SUMMARY

Forrester included eight vendors in this assessment: Canonical, D2iQ, Google, Mirantis, Platform9 Systems, Rancher, Red Hat-IBM, and VMware. Red Hat-IBM is named as a leader.

The report states, "Red Hat-IBM offers the leading platform for both developers and operators."

It also notes: "Red Hat and IBM aim to make "build once, deploy anywhere" a reality; both companies' deep commitment to Kubernetes-powered modernization has paid off, moving OpenShift further ahead of the market since Forrester's last evaluation."

Finally, "Red Hat-IBM is ideal for both cloud-native organizations and large enterprises with complex legacy application modernization needs."

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The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020

The Eight Providers That Matter Most And How They Stack Up

by Dave Bartoletti and Charlie Dai
September 15, 2020

Why Read This Report

In our 29-criterion evaluation of multicloud container development platform providers, we identified the eight most significant ones — Canonical, D2iQ, Google, Mirantis, Platform9 Systems, Rancher, Red Hat-IBM, VMware — and researched, analyzed, and scored them. This report shows how each provider measures up and helps infrastructure and operations professionals select the right one for their needs.

Key Takeaways

Red Hat-IBM, Google, And Rancher Lead The Pack
Forrester's research uncovered a market in which Red Hat-IBM, Google, and Rancher are Leaders; VMware, D2iQ, and Platform9 Systems are Strong Performers; and Mirantis and Canonical are Contenders.

Dev Experience, Distributed Operations, And Ecosystem Integrations Are Key Differentiators
As developers and technology teams race to meet the demand for cloud-native applications, developer experience and development services, distributed infrastructure operations, and rich ecosystem partnerships and integrations will dictate which platform providers will lead the pack.

The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020

The Eight Providers That Matter Most And How They Stack Up

by Dave Bartoletti and Charlie Dai
with Lauren Nelson, Duncan Dietz, Han Bao, and Bill Nagel
September 15, 2020

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Related Research Documents

The Forrester New Wave™: Enterprise Container Platform Software Suites, Q4 2018

Modernize Core Applications With Cloud

Now Tech: Enterprise Container Platforms, Q2 2020

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Dev Experience, Operations, And Integrations Differentiate Vendors

As cloud-native technologies like containers and Kubernetes mature rapidly, they are becoming the preferred way to build new software experiences and modernize existing apps at scale and across clouds. Enterprise customers now seek container development platforms that accelerate and simplify the development and operations (DevOps) of cloud-native apps wherever and however firms build and deploy them.[1] Today's multicloud container development platforms (MCDPs) not only provide comprehensive container infrastructure lifecycle operations from the data center to the cloud to the edge; they also help developers modernize apps with integrated service catalogs and microservices, service mesh, and serverless features.

As a result of these trends, MCDP customers should look for a balanced blend of development and operations features that:

› **Simplify cloud-native app development with rich development services.** The leading solutions draw developers in and jump-start both development and app modernization with microservices frameworks, serverless support, continuous integration and delivery (CI/CD) integrations, dependency management, and app lifecycle management features like code quality checks and vulnerability scanning. Service mesh support further enhances security, robustness, and root-cause analysis for microservices at runtime.[2] Top solutions help developers focus on business logic with comprehensive service catalogs and prebuilt DevOps automations and integration.

› **Enable distributed infrastructure operations from data center to cloud to edge.** Enterprise workloads are increasingly distributed and hybrid. Most vendors in this evaluation offer model-driven configuration, monitoring, security, and cluster lifecycle features for unified multicloud cluster operations; some provide an enhanced control plane with cost management and distributed tracing, dashboarding, and auditing features to improve observability for operations teams. The best solutions extend operational control to the edge and support thousands of clusters.

› **Expand enterprise value with rich app and service partner ecosystems.** Enterprises adopt cloud-native technologies to simultaneously support a range of developer needs, app use cases, and locations. Leading MCDP solutions curate, integrate, and enhance the most popular open source cloud-native technologies to address the broadest set of needs and augment them with a rich partner ecosystem. The best solutions offer broad partner service catalogs, integrations with public cloud and edge services, and multiple pricing and managed deployment options to meet enterprises where they are in their cloud-native journeys.

Evaluation Summary

The Forrester Wave™ evaluation highlights Leaders, Strong Performers, Contenders, and Challengers. It's an assessment of the top vendors in the market and does not represent the entire vendor landscape. You'll find more information about this market in our reports on enterprise container platforms.

We intend this evaluation to be a starting point only and encourage clients to view product evaluations and adapt criteria weightings using the Excel-based vendor comparison tool (see Figure 1 and see Figure 2). Click the link at the beginning of this report on Forrester.com to download the tool.

FIGURE 1 Forrester Wave™: Multicloud Container Development Platforms, Q3 2020

THE FORRESTER WAVE™
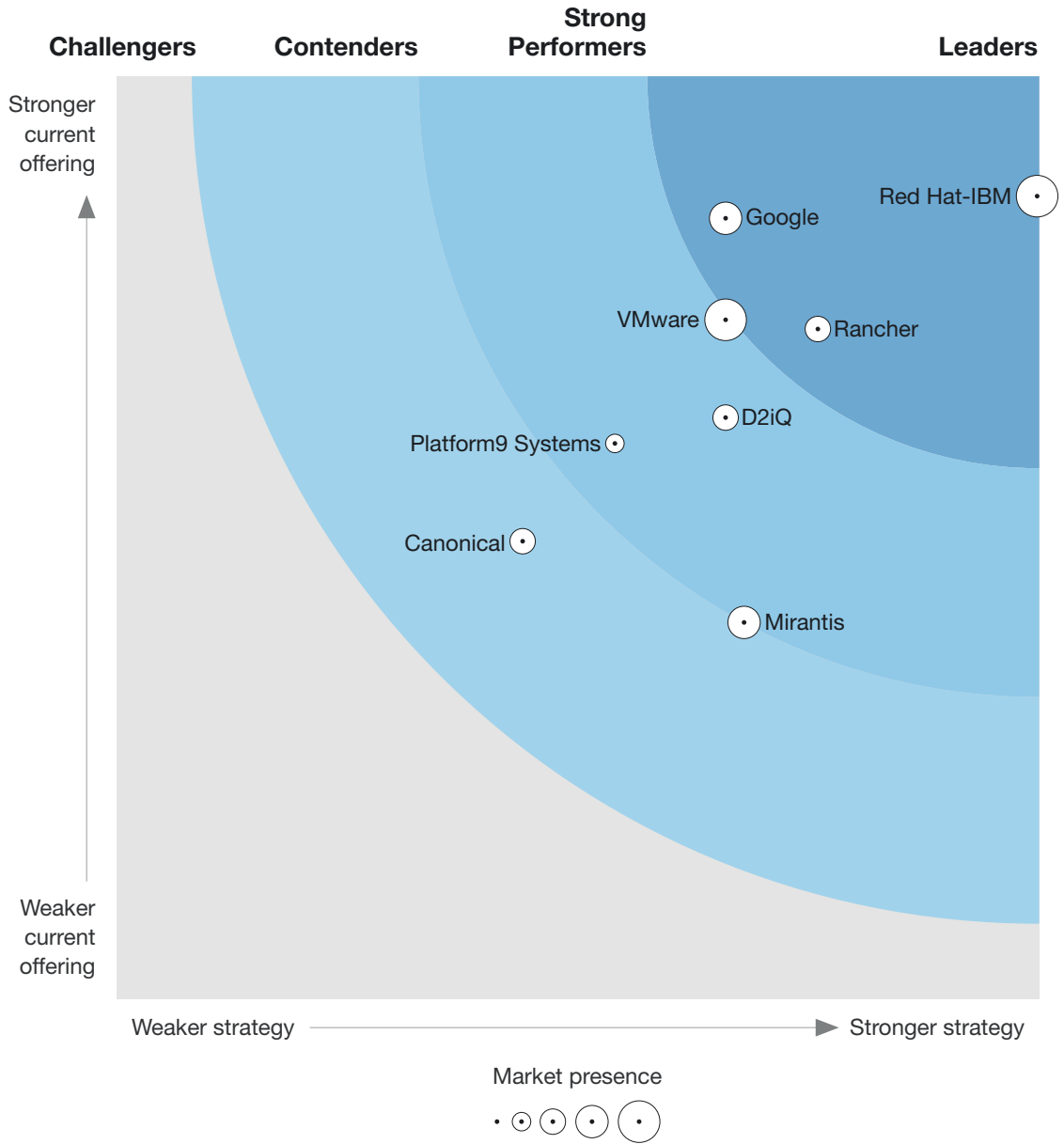### Multicloud Container Development Platforms
Q3 2020

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FIGURE 2 Forrester Wave™: Multicloud Container Development Platforms Scorecard, Q3 2020

	Forrester's weighting	Canonical	D2iQ	Google	Mirantis	Platform9 Systems	Rancher	Red Hat-IBM	VMware
Current offering	50%	2.48	3.15	4.23	2.04	3.01	3.63	4.35	3.68
Platform experience	20%	1.00	1.00	5.00	2.00	3.00	3.00	4.00	5.00
Cloud-native application development	25%	2.10	3.90	4.10	1.45	1.95	2.70	4.60	2.80
Container runtime and registries	10%	4.00	3.00	4.00	3.00	1.00	4.00	4.00	3.00
Platform operations	25%	2.20	3.90	4.80	2.30	4.10	4.60	4.80	4.30
Platform infrastructure	20%	4.00	3.50	3.00	2.00	4.00	4.00	4.00	3.00
Strategy	50%	2.20	3.30	3.30	3.40	2.70	3.80	5.00	3.30
Enterprise strategy	20%	1.00	3.00	3.00	5.00	3.00	5.00	5.00	3.00
Roadmap and innovations	20%	1.00	3.00	3.00	3.00	3.00	5.00	5.00	3.00
Partner ecosystems	15%	3.00	1.00	3.00	5.00	1.00	3.00	5.00	5.00
Professional services strategy	15%	3.00	5.00	3.00	3.00	3.00	3.00	5.00	3.00
Open source strategy	15%	3.00	5.00	5.00	3.00	3.00	3.00	5.00	5.00
Pricing strategy	15%	3.00	3.00	3.00	1.00	3.00	3.00	5.00	1.00
Market presence	0%	2.50	2.60	3.10	3.45	1.10	2.60	5.00	4.05
Customers	45%	3.00	3.00	3.00	4.00	1.00	3.00	5.00	3.00
Product revenue	50%	2.00	2.00	3.00	3.00	1.00	2.00	5.00	5.00
Revenue growth	5%	3.00	5.00	5.00	3.00	3.00	5.00	5.00	4.00

All scores are based on a scale of 0 (weak) to 5 (strong).

Vendor Offerings

Forrester included eight vendors in this assessment: Canonical, D2iQ, Google, Mirantis, Platform9 Systems, Rancher, Red Hat-IBM, and VMware (see Figure 3). We invited SUSE to participate in this Forrester Wave evaluation, but it chose not to participate, and we could not sufficiently estimate its capabilities to be able to include it in the assessment as a nonparticipating vendor.

FIGURE 3 Evaluated Vendors And Product Information

Vendor	Product evaluated
Canonical	Juju 2.7, Charmed Kubernetes 1.18, MicroK8s 1.18
D2iQ	Konvoy 1.4, Kommander 1.0, Dispatch 1.0, KUDO 0.11
Google	Anthos
Mirantis	Docker Enterprise 3.0
Platform9 Systems	Platform9 Managed Kubernetes 4.2
Rancher	Rancher 2.4
Red Hat-IBM	Red Hat OpenShift 4.3
VMware	Tanzu Kubernetes Grid 1.0, Tanzu Application Service 2.8, Tanzu Mission Control, Tanzu Observability, Tanzu Service Mesh

Vendor Profiles

Our analysis uncovered the following strengths and weaknesses of individual vendors.

LEADERS

› **Red Hat-IBM offers the leading platform for both developers and operators.** Since IBM announced its acquisition of Red Hat in 2018, the two companies have made OpenShift the centerpiece of a unified "open hybrid cloud" container platform strategy. IBM has ported valuable functionality such as multicloud management, data and AI services, and integration APIs from Cloud Paks to OpenShift to help enterprises modernize core legacy applications. OpenShift is the most widely deployed multicloud container platform and boasts powerful development and unified operations experiences across many public and on-premises platforms. Red Hat pioneered the "operator" model for infrastructure and application management and provides a rich partner ecosystem and popular marketplace. Red Hat and IBM aim to make "build once, deploy anywhere" a reality; both companies' deep commitment to Kubernetes-powered modernization has paid off, moving OpenShift further ahead of the market since Forrester's last evaluation.[3]

Reference customers gave OpenShift high marks for first-class customer service and support, open source contributions, feature breadth, deployment flexibility, and innovation pace. They also called out the platform's support for microservices application development, integration with native public cloud services, and applicability to a wide range of container use cases. Reference

customers suggested improvements to multicluster visibility, serverless development, and entry price. Red Hat-IBM is ideal for both cloud-native organizations and large enterprises with complex legacy application modernization needs.

› **Google provides a cutting-edge cloud-native development experience.** Google describes Anthos as the culmination of a decade of container innovation, starting with Google Container Engine (GKE) and the creation of Kubernetes itself. Based on the Kubernetes, Istio, and Knative projects, Anthos is a subscription-based managed container development platform designed to help enterprises create, migrate, and modernize apps consistently in the data center, Google Cloud Platform, and other public clouds. Anthos includes the popular GKE service, cloud-based configuration management, logging, and monitoring, and a cloud-native developer environment combining Cloud Run for serverless development and Anthos Service Mesh. Google aims to give cloud-native developers a unified experience from source to delivery and empower operators with a highly available and scalable multicluster control plane.

Google demonstrated excellent developer and operator experience across the cloud-native application lifecycle through its abstractions and powerful DevOps automations. While it did not provide customer references for this evaluation, Forrester has found that customers value Anthos' automated cluster lifecycle operations, control plane management, logging, and policy-driven security features. Its multicloud deployment options and edge computing support need improvement. Google is the best fit for companies that want automated cloud-native platform experience across clouds.

› **Rancher simplifies multicloud Kubernetes management at scale.** Rancher's platform is widely deployed by a broad range of enterprise and cloud-native companies to run large-scale clusters across many public and on-premises clouds. Rancher is 100% open source; embraces and extends native public cloud container services; focuses on intuitive, simplified DevOps automations; and specializes in helping companies operate Kubernetes at massive scale and in edge computing scenarios. The firm's vision is to give customers the freedom to compute everywhere. The Rancher platform includes a comprehensive application catalog, centralized visibility and control of distributed clusters, service mesh innovations, built-in CI/CD pipelines, broad runtime and registry support, and very strong "Day 2" cluster operations, with proven scalability to 5,000 nodes.[4]

Reference customers praised Rancher's comprehensive application catalog coverage, broad public cloud infrastructure integrations, strong participation in the cloud-native open source community, excellent customer support, rock-solid stability, and fast time-to-value. Rancher is ideal for firms seeking a proven multicloud container management platform available on a wide variety of cloud platforms and edge environments. As we were conducting this evaluation, SUSE announced its intent to acquire Rancher in the second half of 2020.

STRONG PERFORMERS

› **VMware delivers a comprehensive Kubernetes platform.** In 2018 and 2019, VMware acquired Pivotal, Heptio, and Bitnami and has integrated products and expertise from all three with its existing container technologies to yield the Tanzu portfolio. Tanzu Application Service (TAS) is Pivotal Cloud Foundry ported to Kubernetes plus an app catalog and data services. Tanzu Kubernetes Grid (TKG) and Mission Control, a Kubernetes multicloud runtime and control plane, is embedded in VMware vSphere 7 and can be extended to additional public clouds. Tanzu management services include service mesh, observability, and training services. VMware aims to embed Kubernetes deeply from the hypervisor to the public cloud. This offers cloud-native developers the powerful and popular one-touch continuous deployment experience of TAS and gives operators a consistent container and virtual machine lifecycle management experience from a vSphere-based data center to the public cloud and edge.

Reference customers praised VMware's platform reliability, hypervisor-based security features, developer experience, multicloud deployment options, and Day 2 lifecycle operations. They noted issues with VMware's pace of innovation when integrating multiple point products, lack of a publicly available roadmap, and complex pricing. There is room for improvement in serverless support. VMware is ideal for firms seeking a highly differentiated developer experience plus consistent container infrastructure management, particularly existing VMware customers adding containers to their environments.

› **D2iQ focuses on simplifying open source cloud-native operations.** Founded in 2013 as Mesosphere and renamed in 2019, D2iQ built a new Kubernetes platform, the Ksphere suite, to expand its strategy to deliver an enterprise-grade cloud-native operations experience on any cloud. We evaluated D2iQ's Kubernetes platform, consisting of Kubernetes distribution Konvoy; Kommander, a unified Kubernetes cluster control plane; the KUDO Kubernetes operators for stateful workload management; and Dispatch, which is GitOps-style DevOps automation. Training and educational services are available. The vendor prioritizes fidelity with all upstream cloud-native projects and is expanding its ISV ecosystem partner and channel partner rosters. Its pricing strategy is geared to help enterprises establish solid Day 2 operations with a low-priced starter pack. D2iQ managed to expand its customer base throughout the process of renaming the company and rebranding its products.

Reference customers like D2iQ's open source strategy, operator experience, deep cloud-native expertise, and customer support. They noted complex pricing, lagging documentation, and customer support response times as areas for improvement. D2iQ lacks an intuitive and simplified experience for development and cluster operations teams, instead favoring command-line interfaces. D2iQ is well suited to firms seeking a multicloud development platform with a flexible architecture using a GitOps approach.[5]

› **Platform9 Systems delivers cloud-native technologies with SaaS simplicity.** Platform9 serves customers that are underserved by one public cloud, offering a software as a service (SaaS) Kubernetes cluster management experience like native public cloud services but on a wider range

of on-premises, cloud, and edge infrastructures. Since we last evaluated this market in 2018, Platform9 has significantly improved its position thanks to rapid innovation, strong customer acquisition, and the expansion of use cases, particularly among retail, media, and telecom companies. A newly simplified pricing model, which includes a freemium tier, helps companies lacking deep cloud-native operations skills expand their container deployments confidently. Platform9 offers a SaaS-only Kubernetes experience for customers with expanding container environments that need remote operations and a solid developer experience.

Reference customers value the platform's ease of deployment, intuitive interfaces for operations teams, cluster and control plane lifecycle features, responsive support and professional services, and innovations for edge computing scenarios. They would like to see support for previous upstream Kubernetes versions. The overall development experience lags, with fewer prebuilt integrations for microservices development and a limited ISV partner ecosystem. Platform9 is a good fit for firms looking to offload all container operations as they expand cloud-native use cases.

CONTENDERS

› **Mirantis offers a solid container platform for cloud-native development.** In 2019, Mirantis acquired the Docker Enterprise container platform and released the beta version of its own Kubernetes as a service (KaaS). Mirantis KaaS will enhance Docker Enterprise with multicluster management features when the two are fully integrated. Docker Enterprise is widely deployed and led our evaluation in 2018, but adoption has slowed and Forrester client interest has waned as new competitors have entered the market and competing solutions have improved rapidly. Mirantis is investing heavily in product integrations and wrapping managed services around Docker Enterprise in order to serve more enterprise cloud-native developers and operations teams, particularly those in regulated environments like financial services.

Reference customers were positive about the platform's solid implementation of open source technologies, ease of implementation, and secure registry features. They also said that it was easy to do business with Mirantis. Logging and monitoring, cost management, edge computing support, and container storage options need improvement. Features for cloud-native developers, microservice development support, serverless, and service mesh also need improvement. Mirantis is a good fit for firms seeking to offer containers as a service to cloud-native development teams.

› **Canonical aims to simplify model-driven Kubernetes app management.** Expanding on the global success of Ubuntu Linux in the public cloud, Canonical is taking an approach to making Kubernetes easier to consume and operate that is explicitly not platform as a service (PaaS). Canonical claims that developers increasingly shun integrated development; it believes that developers will favor self-service consumption of any Kubernetes distribution over packaged PaaS environments and prefer to assemble apps as operators, not hard-coded services. Canonical pioneered the JuJu app and infrastructure modeling engine and curates a marketplace of

Charms (equivalent to Kubernetes Operators) that developers can use to build apps and deploy infrastructure from model-driven templates. Forrester evaluated Juju as a service, which is Canonical's managed Charm service; bare-metal deployments are also available as a service.

Reference customers noted Canonical's strongly consistent multicloud deployment and leading open source culture. While customers praised the vendor's ease of control plane configuration, they said that the learning curve is steep and product documentation needs improvement. Canonical offers features for service mesh, serverless, DevOps automations, and integration support, but its application catalog and microservice development features are limited. The solution lacks a unified, intuitive developer experience. Canonical is a good fit for firms focused primarily on simplifying container infrastructure and app management with a model-driven, infrastructure-as-code approach.

Evaluation Overview

We evaluated vendors against 29 criteria, which we grouped into three high-level categories:

› **Current offering.** Each vendor's position on the vertical axis of the Forrester Wave graphic indicates the strength of its current offering. Key criteria for these solutions include platform experience, service and application catalogs, microservice development support, service mesh support, serverless and function as a service support, DevOps automation, integration support, control plane configuration, cluster lifecycle operations, logging and monitoring, multicloud deployment options, and edge computing support.

› **Strategy.** Placement on the horizontal axis indicates the strength of each vendor's strategy. We evaluated enterprise strategy, roadmap and innovation, partner ecosystems, professional services strategy, open source strategy, and pricing strategy.

› **Market presence.** Represented by the size of the markers on the graphic, our market presence scores reflect each vendor's number of customers, product revenue, and revenue growth.

VENDOR INCLUSION CRITERIA

Forrester included eight vendors in the assessment: Canonical, D2iQ, Google, Mirantis, Platform9 Systems, Rancher, Red Hat-IBM, and VMware. Each of these vendors has:

› **A comprehensive, differentiated multicloud container development platform.** Vendors offer more than container infrastructure management, with specific features for cloud-native development teams to build and deploy complete applications across multiple cloud platforms. They offer both development and operations tools and features.

› **A standalone platform that supports multiple use cases marketed to enterprises.** The solution must include differentiating features attractive to large enterprises beyond open source

components. The vendor must have at least 10 paying, named enterprise customers using the version of the evaluated solution and proven revenue from customer adoption.

› **Presence in client inquiries and/or is on Forrester's research radar.** Forrester clients often discuss vendors and products through inquiries; those vendors and products may also come up in advisory engagements with testing vendors. A vendor may, in Forrester's judgment, warrant inclusion or exclusion due to client interest or lack thereof, its market presence, or shifting technology trends.

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Supplemental Material

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We publish all of our Forrester Wave scores and weightings in an Excel file that provides detailed product evaluations and customizable rankings; download this tool by clicking the link at the beginning of this report on Forrester.com. We intend these scores and default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs.

THE FORRESTER WAVE METHODOLOGY

A Forrester Wave is a guide for buyers considering their purchasing options in a technology marketplace. To offer an equitable process for all participants, Forrester follows The Forrester Wave™ Methodology Guide to evaluate participating vendors.

In our review, we conduct primary research to develop a list of vendors to consider for the evaluation. From that initial pool of vendors, we narrow our final list based on the inclusion criteria. We then gather details of product and strategy through a detailed questionnaire, demos/briefings, and customer reference surveys/interviews. We use those inputs, along with the analyst's experience and expertise in the marketplace, to score vendors, using a relative rating system that compares each vendor against the others in the evaluation.

We include the Forrester Wave publishing date (quarter and year) clearly in the title of each Forrester Wave report. We evaluated the vendors participating in this Forrester Wave using materials they provided to us by April 1, 2020, and did not allow additional information after that point. We encourage readers to evaluate how the market and vendor offerings change over time.

In accordance with The Forrester Wave™ Vendor Review Policy, Forrester asks vendors to review our findings prior to publishing to check for accuracy. Vendors marked as nonparticipating vendors in the Forrester Wave graphic met our defined inclusion criteria but declined to participate in or contributed only partially to the evaluation. We score these vendors in accordance with The Forrester Wave™ And The Forrester New Wave™ Nonparticipating And Incomplete Participation Vendor Policy and publish their positioning along with those of the participating vendors.

INTEGRITY POLICY

We conduct all our research, including Forrester Wave evaluations, in accordance with the Integrity Policy posted on our website.

Endnotes

[1] Forrester divides the enterprise container platform market into three categories: multicloud container management platforms, multicloud container development platforms and public cloud container platforms. See the Forrester report "Now Tech: Enterprise Container Platforms, Q2 2020."

[2] See the Forrester report "With Microservices, A Service Mesh Helps Developers Focus On The Business."

[3] In 2018, Forrester evaluated the emerging multicloud container development platform market under a different name. For a snapshot of how some of the vendors in this current evaluation performed and how their market positions have since evolved, see the Forrester report "The Forrester New Wave™: Enterprise Container Platform Software Suites, Q4 2018."

[4] "Day 2" operations refers to the monitoring, troubleshooting, and maintenance of systems after they have been deployed.

[5] GitOps is a process by which developers can manage operational workflows, particularly for Kubernetes environments, using Git or a similar version control system to act as a single source of truth for configuration information.

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