Selecting a Hybrid and Multicloud Management Solution, 2020–21

OMDIA

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Summary

Catalyst

The role and purpose of IT in organizations is undergoing significant change, driven by the need for businesses to become more agile. This report provides a side-by-side comparison and evaluation of leading hybrid and multicloud management solutions, with the findings delivered as the Omdia Universe (see Figure 1). It considers the significance of management in a hybrid and multicloud world to support the business requirement for agility.

Figure 1 The Omdia Universe for hybrid and multicloud management1

OMDIA UNIVERSE: Selecting a Hybrid and Multicloud Management Solution
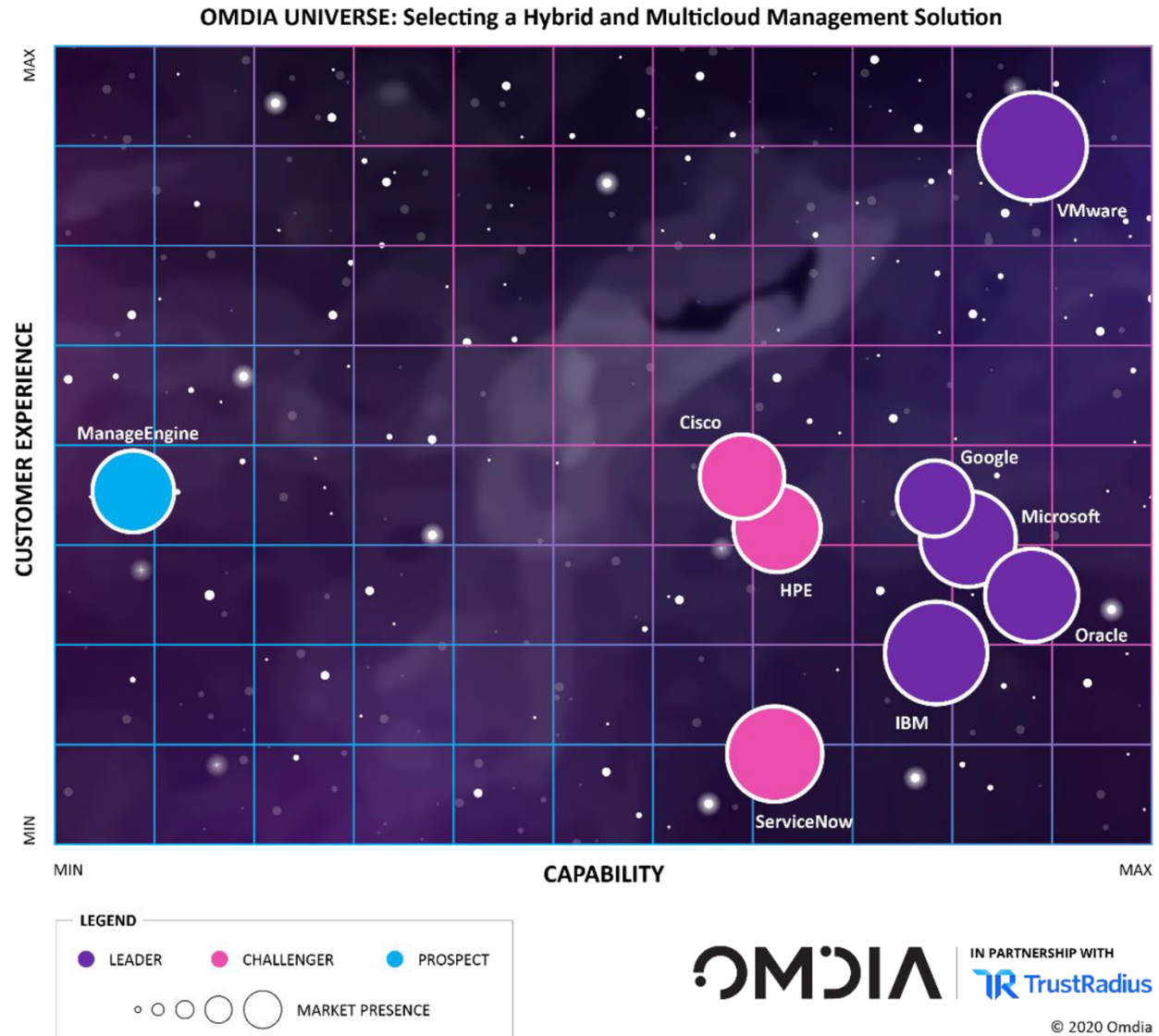
Source: Omdia

Omdia view

The challenges of managing cloud resources and services has become a much greater part of the IT department's role and responsibility over the past 10 years. The use of cloud computing is continuing to grow as organizations look for more agile approaches to IT delivery of applications, workloads, and services. Initially, many organizations adopted cloud for business productivity and customer-facing applications, but increasingly, the types of applications and workloads moving to a cloud environment are changing to include core systems such as ERP, CRM, and so on. While it is true that the cloud is not the ideal environment for every workload/application, it is now becoming the accepted norm that a cloud-first strategy is more common.

As the type of workload/applications moving to the cloud is changing so is the expectation of what the cloud provider must deliver to meet business needs. This increased demand for resiliency, protection, and service continuity has seen the growth of hybrid cloud environments. The hybrid cloud is not a singularity; it

is a construct that enables bridges between clouds to be built so as to support workloads/applications that require on-premises deployment. The cloud providers are extending the operational and functional benefits of their cloud platforms to customer premises. The goal is to make it easier for enterprises to take advantage of cloud services. The motivation is to drive more traffic and revenue to the cloud and to capture those customers that have previously been reluctant to move core applications to the cloud because of regulation and compliance requirements.

Key messages

- For the second successive report, VMware is the clear leader in the Omdia Universe, scoring an overall average of 80.80% across all three dimensions.

- Microsoft, IBM, Google, and Oracle are also classified as leaders, all scoring an average of over 70%. The other distinction was that the leaders were responsible for 95% of the 16 subcategory- leading scores.

- The challengers' performance ranged from an average score of 67% to just below 70%, but the key differentiator was that no challenger recorded more than one subcategory-leading score.

- The prospects all showed significant promise as solutions that are being developed. Prospects are characterized as having some gaps in their capabilities that are still a work in progress.

Analyzing the hybrid and multicloud management universe

How to use this report

Omdia is a proud advocate of the business benefits derived through technology, and hybrid and multicloud management is at the forefront of realizing benefits to marketers across the globe. The Omdia Universe report is not intended to advocate an individual vendor but rather to guide and inform the selection process to ensure all relevant options are considered and evaluated in an efficient manner. By using in-depth reviews on TrustRadius to derive insights about the customer experience, together with the analyst's knowledge of the market, the report findings gravitate toward the customer's perspective and likely requirements, characteristically those of a medium-large multinational enterprise (5,000-plus employees). Typically, deployments are considered across the financial services, TMT (technology, media, and telecoms), and government sectors, on a global basis.

Market definition

In this report, Omdia developed a series of features and functionality that would reveal differentiation between the leading solutions in the marketplace. The criteria for hybrid and multicloud management are as follows:

- Monitoring: this looks at a solution's ability to monitor resource usage and its impact on performance. In the 2020–21 report, monitoring is extended beyond just performance monitoring to include mobile, services, and containers technologies.

- Private cloud management (server, network, storage, I/O): this includes the ability to manage all aspects of the infrastructure delivery chain from server, network, storage, endpoint, to I/O.

- Public cloud management: this considers how well the solution integrates with other cloud solutions, allowing not only visibility into resource usage, but control and management of those environments.

- Service modeling and financial management: one of the biggest challenges for any CIO is being able to predict future resource needs by type and delivery method. This section looks at how well the solutions allow for modeling and support "what-if" analysis. An increasingly important, if underrepresented, capability is that of managing the cost and financial aspects of delivering services to line-of-business customers.

- Operational management (scale, delivery, provisioning): this examines the ability to manage at scale across different geographies and technologies.

- Security management (DevSecOps): the rise of DevSecOps has changed how the IT operations function thinks about the management of applications. This section focuses on how well the solutions support the concept of security and lifecycle management and align with any DevSecOps approach.

- Backup and resiliency: the ability to secure and protect data should be implicit in any solution. Although these solutions are primarily seen as backup and recovery solutions, they must be able to perform basic data protection and support security integrations.

- Lifecycle management and automation: the need to automate as many operational activities as possible aligns with the CIO's need to reduce costs. This section looks at how the solutions enable different levels of automation.

- Reporting and integration: this capability is the need to produce more than the standard weekly resource usage report. This section evaluates the solution's ease of integration with other data sources and how user friendly its reporting capabilities are.

- Marketplace management: this evaluates the ability to operate and manage the applications and services that customers can select and deploy to the cloud from a marketplace.

Market dynamics

Changes from previous report

One of the most obvious changes in the market since the previous report (Omdia Decision Matrix: Selecting a Hybrid and Multicloud Management Solution, 2018–19) is the number of vendors taking part has reduced from eleven to nine. This reduction in the market is due to a number of factors:

1. Mergers and acquisitions in the market have reduced the number of vendors. This trend has been driven by the increased breadth of requirements, forcing specialist vendors to be acquired and incorporated into

fewer bigger vendor offerings. For example, Red Hat's capabilities are now incorporated into IBM's offering, Micro Focus is now part of HPE's submission, CloudHealth was acquired by VMware, and CliQr is now fully integrated into Cisco.

2. The multicloud inclusion criteria of this report eliminated a number of those vendors with only proprietary management solutions for either single on-premises private cloud or a single public cloud.

Key market trends

The growth of hybrid cloud is seen as pivotal to the wider adoption of cloud computing, because it enables organizations to begin their journey to cloud computing in a way that matches their strategy. However, different cloud providers have taken different approaches to support the enterprise demand for hybrid cloud solutions:

- Amazon Web Services (AWS), Microsoft, and Oracle have developed proprietary edge and hybrid cloud appliances.

- Google and IBM have software solutions based on a platform-agnostic container-based environment.

The two approaches to enabling distributed cloud workloads are not exclusive. The proprietary cloud platform of the cloud providers also supports open source container-based application deployment and management. However, the management is much more rudimentary than with the software- based platforms developed with the open source community. The hardware/appliance approach is witnessing cloud providers working with hardware OEMs to deliver edge and hybrid cloud infrastructure solutions for their own clouds.

The management challenges faced by IT departments are amplified as organizations adopt different public clouds and different hybrid cloud approaches. The complication is that organizations are selecting the cloud environments based on factors such as cost, resiliency, regulatory compliance, service disruption, and security to match the persona of the workloads/applications.

Table 1: Vendor rankings in the Omdia Universe for hybrid and multicloud management

Vendor	Product(s) evaluated
Leaders	
Google	Google Cloud Operations, Cloud Deployment Manager, Cloud Console, Cloud Shell, Cloud Console Mobile App, Cloud APIs, Anthos
IBM	IBM Cloud Pak for Multicloud Management
Microsoft	Azure Automation, Azure Advisor, Azure Backup and Azure Site Recovery, Azure Lighthouse, Azure Migrate, Azure Monitor, Azure Portal, Azure Resource Manager, Azure Arc, Azure Stack, Azure Cost Management
Oracle	Oracle Enterprise Manager, Oracle Cloud (services covering management, observability, security, database, application development, and marketplace)
VMware	vRealize Suite, Tanzu Observability by Wavefront, CloudHealth, Skyline
Challengers	
Cisco	Cisco CloudCenter
HPE	GreenLake
ServiceNow	ITOM Operator Enterprise
Prospects	
ManageEngine	Cloud Spend, Site 24x7

Market leaders

The market leaders all scored an average across all three dimensions of greater than 70%, and they accounted for 95% of the subcategory-category leading scores. The leaders also demonstrated a breadth of capability with only 20% of the recorded below-subcategory-category average scores. The other criterion for being a leader was being within 11% of the overall leader's score.

Market challengers

The challengers all scored between 67.53% and 69.31% and were characterized as solid performers with the gap between their performance and that of the leaders (except VMware) being a matter of fine margins. Omdia considers that the market is in transit and is shifting its emphasis from a technical management capability to a services-centric approach. The challengers to different degrees all demonstrated a strong performance in the service management aspects.

Market prospects

The market prospects all scored below 60% on average and were characterized as being solutions in development. The prospects provided strong capabilities in a few subcategories, which were matched by weaknesses in other subcategories. However, Omdia believes that the prospects all have development plans for evolution of the solutions.

Market outlook

The market in hybrid and multicloud management is growing at a CAGR of over 22% between 2018 and 2023, according to Omdia's Software Market Forecasts: Infrastructure, 2019–24. Omdia forecasts the market will be worth more than $14 billion by 2023, with North America the largest market, accounting for $5.6 billion (see Figure 2). To put this in context, the infrastructure management market is forecast to be worth just over $2 billion by 2023, with North America again the largest market, accounting for almost $700 million. Further evidence of the move to cloud is provided by an analysis of the infrastructure spending by IT

departments. In 2019 the average percentage of the IT budget spent on server and storage was 4.65%, compared to 7.85% spent on cloud (infrastructure as a service [IaaS], platform as a service [PaaS], and software as a service [SaaS]). The forecast is for this gap to widen as IT budgets in enterprise organizations reduce spending on physical infrastructure, a trend accelerated by the COVID-19 pandemic.

Figure 2: Omdia market forecast for hybrid and multicloud management
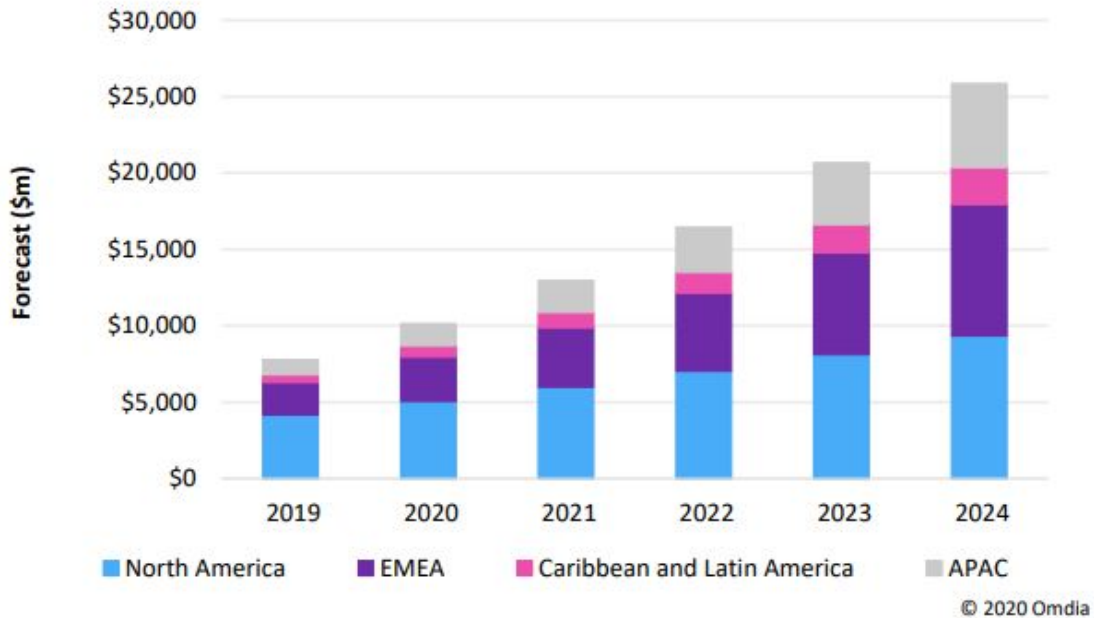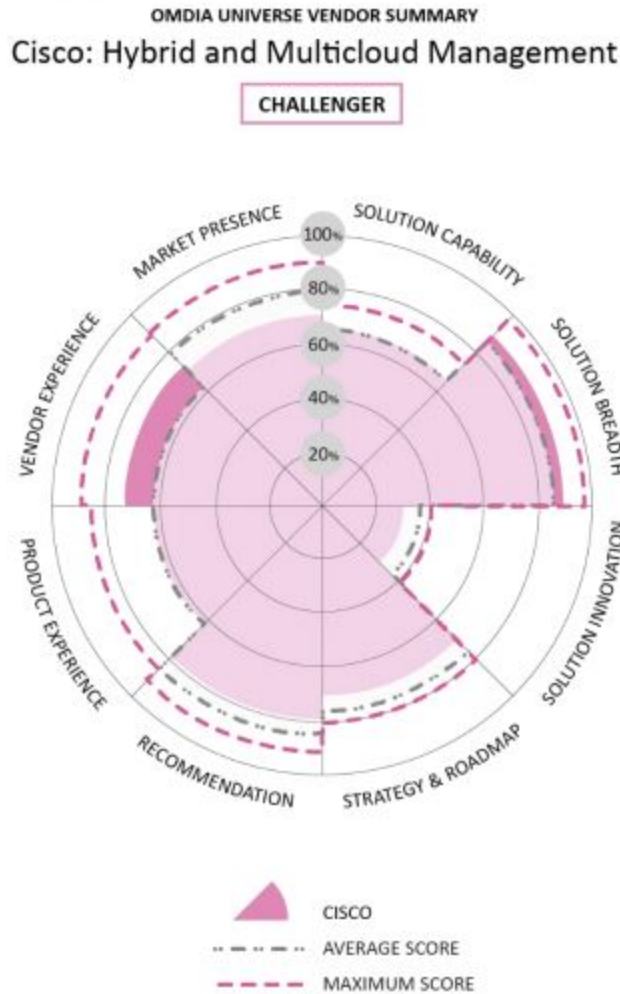

Source: Omdia

Vendor analysis

Cisco (Omdia recommendation: Challenger)

Product: Cisco CloudCenter

Cisco should appear on your short list because it offers a consistent capability across all the subcategories

Figure 3 shows the high-level performance of Cisco, where Cisco CloudCenter recorded an overall average score of 67.93% across the different dimensions. Omdia considered that its overall performance was consistent and was particularly strong in terms of the governance and security (69%), public cloud management (77%), and breadth of environments it supported (89%), with an average score across all the relevant capabilities dimension subcategories of 62%. Cisco's approach is to take an application-centric perspective to deliver hybrid and multicloud management. The scoring by Cisco reflected this approach because its capabilities were distributed between the different subcategories. However, perversely, taking this approach meant Cisco's weakest subcategory was marketplace and application management (54%). This score was a result of Cisco's lack of capabilities in the management of marketplaces, which was compensated for by its advanced application management capabilities.

Figure 3: Omdia Universe ratings: Cisco

OMDIA UNIVERSE VENDOR SUMMARY

Cisco: Hybrid and Multicloud Management

CHALLENGER

CISCO
AVERAGE SCORE
MAXIMUM SCORE

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Source: Omdia

Cisco's application-centric approach evolved from its acquisition in 2016 of CliQr, which has now been fully integrated and renamed to become Cisco CloudCenter. Cisco CloudCenter is a multicloud management platform that works across multiple cloud and data center environments. It is designed to be a single-point-of-access solution for users to securely deploy, optimize, and manage workloads in any environment. Omdia also liked the simplicity of its blueprint approach to management. However, in comparison with other solutions, Cisco CloudCenter was less sophisticated and feature rich in terms of its monitoring and management capabilities, although Omdia acknowledges these are delivered in a different way from others in the market.

Omdia considers that Cisco CloudCenter enables businesses to easily and efficiently model, migrate, and manage applications, users, and clouds. CloudCenter's application-defined technology decouples applications from the complexity of hybrid cloud environments rather than taking the traditional approach of manually forcing applications to conform to a variety of changing physical, virtual, and cloud environments. The platform automates the dynamic provisioning of optimal infrastructure, enabling resources and settings based on application needs, which leads to new levels of operational efficiency and security.

Cisco CloudCenter supports all the leading cloud platforms as well as on-premises private-cloud technologies such as VMware and OpenShift. CloudCenter, like many other solutions, manages multiple workload types from bare metal to containers. Omdia considers this is now an expected capability of any management solution, but the breadth of platforms supported is class leading. Cisco CloudCenter, while it lacks the richness in terms of resource management and monitoring of other solutions, provides comprehensive application management capabilities.

CloudCenter uses the concept of application profiles, which are templates or blueprints that can be used to describe how applications should be deployed, configured, and managed in various cloud environments. The use of these templates is how Cisco addresses the simplicity of management and accelerated time to value. Omdia believes that enabling users to quickly design and onboard applications in a cloud-independent manner is a key strength of Cisco. The other business advantage of this application profile approach is that it enables developers to design their applications to be flexible and portable.

Cisco CloudCenter Application Modeling is how it captures all images, scripts, and other dependencies. Omdia considers that the ability to use this process on existing as well as new applications is significant, because it means CloudCenter blueprints can make any application portable. Omdia cautions that while the concept of application modeling is a clever approach to solving application portability, it still requires some resources to perform the modeling process, such as configuring all the images, constructing these as services, and modeling the application. The process is not complex, and Omdia likes the simplicity of the stages: mapping the environment to a logical image then mapping the logical images to real images on a per cloud basis. When all the relevant images are in place, the services can be built. The services have an associated lifecycle framework that calls different commands at different points in the service's lifecycle, and combining these services results in a working application deployment.

Omdia considers the noteworthy aspect of the blueprint concept is that the user does not need to provide any cloud-specific information, or to hard-wire the profile to any specific cloud infrastructure. The approach taken by Cisco CloudCenter is for the Workload Manager to pass the application to the respective cloudblade container. Omdia considers that the other benefits from using the Cisco CloudCenter application-centric approach are

- The ability to rapidly onboard applications

- The ability for users to benchmark any application on any cloud to select the best execution environment for the desired cost and performance requirements

- Simplified management with applications deployed with one click

- Enforced governance through policies that span applications, clouds, and users

- The ability to secure data at rest and in transit, including network isolation, key management and vaulting, audit logging, and so on

- Easy migration of applications to different clouds when the cloud service provider or application requirement situation changes

- Management of the lifecycles of all applications via a single dashboard, delivering true IT as a service
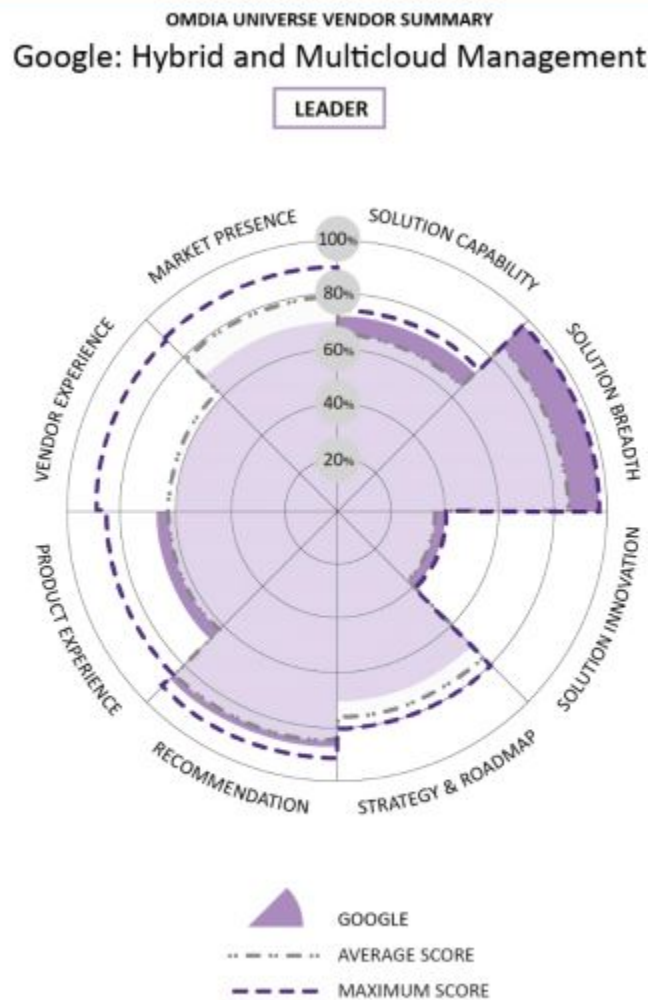
Google (Omdia recommendation: Leader)

Products: Google Cloud Operations, Cloud Deployment Manager, Cloud Console, Cloud Shell, Cloud Console Mobile App, Cloud APIs, Anthos

Google should appear on your short list because it has a particular strength in operational management

Google's approach to hybrid and multicloud management is based on a cloud-based control plane in Google Cloud Platform (GCP). Figure 4 shows the high-level performance of Google, where Google's average across all three dimensions is 70.35%, which was 10.46% below the overall leader and was just inside the Universe's criterion of being less than 11% below the overall leader. Omdia considers that Google's approach is a radical shift from the traditional cloud management approach, and in this Universe it scores well for operational management (81%) and lifecycle management (82%). Google's weakest subcategory was public cloud management (61%). Google is using advanced technologies such as artificial intelligence / machine learning (AI/ML) to enhance the management experience.

Figure 4: Omdia Universe ratings: Google

OMDIA UNIVERSE VENDOR SUMMARY

Google: Hybrid and Multicloud Management

LEADER

Legend:
- GOOGLE
- AVERAGE SCORE
- MAXIMUM SCORE

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Source: Omdia

Omdia considers that Google's significant strengths are the agility and flexibility aspects of how its approach to management operates. One of Google's most innovative capabilities is its approach to partnerships and how, by using its technology, it can enhance and expand adjacent management activities. For example, Google's Contact Center AI is a conversational capability that supports IT service management (ITSM) integration and facilitates greater collaboration between different IT teams. Omdia believes that its human-like interactions are redefining the possibilities of AI-powered conversation. The technology can be used to

understand what customers are saying through its speech-to-text capability. This is just one example of how Google is using advanced deep-learning algorithms to augment management activities and improve the applicability of its solutions.

Google scored well for its operational management capabilities and, in particular, how software is deployed. The common method of deploying software involves a combination of configuring the application and setting up the host operating environment. This process means the developer needs to carefully track and resolve any runtime dependencies. For example, if two applications running on a virtual machine (VM) use different versions of the same library, the developer must install both versions and point to them through system variables. Google's approach is to provide a DevOps solution that has the visibility and tools needed to ensure these issues are identified early in the lifecycle. When it comes to cloud-native applications, Google is one of the leading vendors in the space, and Google Kubernetes Engine (GKE) is a container orchestration platform that offers both scalability and configuration flexibility. GKE supports complete control over every aspect of container orchestration including networking, storage, and observability. Overall, GKE provides an environment for deploying, managing, and scaling containerized applications and delivers numerous benefits such as

- Automatically managing workload density, which results in cost savings by efficiently managing environment usage, particularly important in public cloud environments

- Automatically monitoring and managing the health of container workloads, including the ability to automatically restart workloads

- Lifecycle management ability to reduce time to market by facilitating faster, automated continuous integration and continuous delivery processes

- Access to a range of modern operational management capabilities such as Google Cloud Operations, Istio, and other cloud services

Providing choice to customers about how operational management is performed is another of Google's strengths. Google Anthos is a shared-responsibility model for an on-premises deployment and a fully managed service for the cloud deployment. However, if the on-premises deployment is offline, Google is unable to perform any management capabilities. Currently, Anthos will only manage GCP, but the technology will quickly be able to manage any public or private cloud. Omdia considers that including Istio, config and policy, and Knative management is a major step in the simplification of managing cloud-native deployments at scale. The skills shortage in Kubernetes has been highlighted by many CIOs as an issue, and GKE was Google's approach to helping enterprise customers overcome this skill challenge. Anthos will extend this to those other new technologies that will equally be reported as areas where skills are in short supply. Anthos also includes security, and all users will receive GKE Advanced security features such as the digital signature of applications in the repository and the vulnerability scanning. Google also demonstrates its cloud-native strengths by providing Cloud Run, a solution that offers greater choice and flexibility. For example, applications that do not require the comprehensive cluster configuration and monitoring provided by its GKE solution can benefit from Cloud Run. Cloud Run is a serverless platform for stateless containerized microservices that does not require Kubernetes features such as namespaces, co-location of containers in pods (sidecars), or node allocation and management. Omdia considers that the choice and flexibility of these capabilities is why Google scored so highly in the operational management and lifecycle management subcategories.

One of the advantages that Google has over its rivals is it controls and operates a large backbone network that supports its customers. This experience has helped Google with its approach to private/hybrid cloud management. Virtual Private Cloud (VPC) gives organizations the flexibility to scale and control how

workloads connect regionally and globally. Connecting on-premises or remote resources to Google Cloud, customers gain global access to a VPC without needing to replicate connectivity or administrative policies in each region. Organizations can bring their own IP addresses to Google's network across all regions. A single Google Cloud VPC can span multiple regions without communicating across the public internet. For on-premises scenarios, this means organizations can share a connection between VPC and on-premises resources with all regions in a single VPC.

Google also scored well for monitoring, which Google again delivers in a new and different way from traditional management solutions. Cloud Monitoring collects metrics that measure the performance of the service infrastructure. The performance metrics that Google can collect are automatically identified based on a set of known service types. For example, if your service has request-count or response-latencies metrics, standard service-level indicators (SLIs) can be derived from those metrics by creating ratios such as the ratio of the number of successful responses to the total number of all responses or a ratio of the number of calls below a latency threshold to the total number of all calls. Omdia believes that the ability for organizations to set up service-specific SLIs for what the organization considers "good performance" makes Google's approach suitable for different audiences.

HPE (Omdia recommendation: Challenger)

 Product: GreenLake

HPE should appear on your short list because of its strong compliance capabilities

HPE's approach to hybrid and multicloud management is to offer a flexible self-service or managed service based on a combination of its own capabilities and third-party solutions. Figure 5 shows the high-level performance of HPE. HPE is classified as a challenger in this Universe because across all three dimensions it scored 69.31%, 11.5% behind the overall leader. HPE's results were just below the 72% average figure required to be classified as a leader and just outside 11% of the overall leader's score. HPE was strongest in monitoring (81%), service modeling and financial management (74%), and lifecycle management and automation (71%) and was weakest in public cloud management (44%), which was because the HPE GreenLake service does not manage any technical capabilities in public clouds. Note that HPE's PointNext Advisory and Professional Services provide significant public cloud management capabilities acquired through the acquisition of Cloud Technology Partners. While this does not fall under the HPE GreenLake brand, HPE as an organization provides a number of public cloud managed service provider (MSP) solutions. Omdia accepts that in the hybrid and multicloud management market the direction of travel is to enable developers to use the native cloud for these capabilities (as delivered by GreenLake), while for operations, supporting increased automation of these activities is a key capability.

The HPE GreenLake monitoring platform is capable of monitoring anything that can produce an output in any of the following formats: management information base (MIB), object identifiers (OID), simple network management protocol (SNMP), or application programming interface (API). HPE has solutions for implementing monitoring tool sets so that it can monitor a customer's entire IT estate from traditional IT core architecture to edge environments and extending out to the cloud environments. HPE can consolidate the view of the hybrid environment by bringing together all of the managed area into customer catalogs, portals, and dashboards that provide a single place for a customer to access all the information.

Omdia considers the HPE GreenLake Continuous Compliance solution to be a particular strength in the monitoring subcategory. HPE monitors the underlying infrastructure and services in use by the various cloud platforms by using APIs. It then compares the results to required regulatory frameworks and controls that customers must adhere to for audit purposes or internal governance. HPE currently has 16 frameworks

released for AWS and Azure with more in development including HPE GreenLake on-premises offerings. The service includes key frameworks such as NIST 800-53, CIS, ISO 27000, SOX, GDPR, HIPAA, PCI DSS, NZISM (New Zealand), AUISM (Australia), MAS (Singapore), and others. HPE also supports the creation of custom frameworks for internal governance requirements. The system has rules that interpret the required controls and code on how to gather evidence as to whether the infrastructure and services being used are in compliance or not. The results are provided in a series of dashboards and reports along with specific recommended remediations for any out-of-compliance situations.

HPE's second-strongest capability is service modeling and financial management, where the financial management capabilities were on par with that of the leaders. HPE's solution leverages its own IP in terms of application assessment and migration planning, developed by HPE PointNext Services and branded as Right Mix Advisor. HPE uses automation to collect, enrich, and normalize application data into a master data repository (MDR). Right Mix Advisor looks at this data to understand the suitability of moving the application to all options within the customer's hybrid cloud estate. It selects the best fit according to three main dimensions: technical fitness, business value, and potential risk. These three dimensions represent the high-level classification and are supported by other subcriteria such as architecture, performance, security, SLAs, and so on. Each hybrid cloud option's capabilities are modeled in profiles that are matched against the application characteristics (stored in the MDR). The same approach is used to analyze all possible approaches and recommend the most suitable migration strategy and whether it is recommended to retain, move as is, or modernize (replace or refactor to cloud native or containerize).

HPE's third-strongest capability is lifecycle management and automation and its ability to be proactive in terms of patch management. HPE GreenLake Management Services (GMS) monitors software releases and their applicability to the supported environment, making use of the agreements in place between the customer and the relevant software vendors. HPE also sets platform lifecycle management (PLM) triggers for various platform components under management. PLM is the method by which GMS ensures a product within a covered solution is cared for as it moves through its lifecycle.

HPE's weakest capability is public cloud management: currently HPE does not provide technical or business services management for public cloud environments. HPE does provide consumption analytics that provide a single common interface for incorporating costs from AWS and Azure. Through this platform, customers can compare cloud costs, utilize analytics for identification of cost- saving opportunities, and provide for process and governance of cloud spend. Additionally, HPE's PointNext Advisory and Professional Services provides professional, operational, and educational cloud services. These services are provided as part of a professional services engagement and are focused on providing clients with a full range of technical and business services for cloud.

Figure 5: Omdia Universe ratings: HPE

OMDIA UNIVERSE VENDOR SUMMARY

HPE: Hybrid and Multicloud Management

CHALLENGER
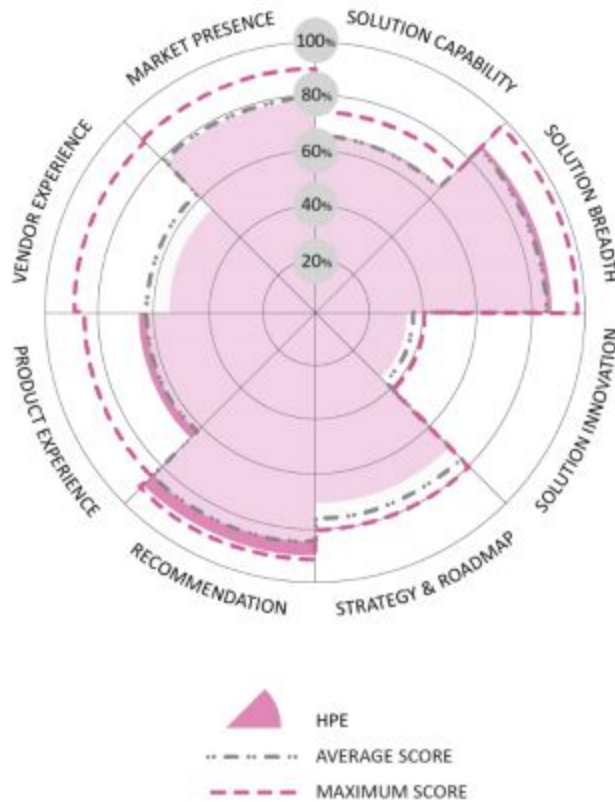
IBM (Omdia recommendation: Leader)

Product: IBM Cloud Pak for Multicloud Management

IBM should appear on your short list because of its strength in lifecycle management

Figure 6 shows the high-level performance of IBM, which is classified as a leader in the Omdia Universe with an average score of 72.35%. IBM scored well for monitoring (86%), lifecycle management and automation (85%), and backup and resiliency (80%); its weakest subcategories were marketplace (55%) and service modeling (56%). IBM's overall performance was affected by a lack of capacity planning capability in the service modeling subcategory and by the fact that there is no specific video or integration with software release capabilities in the marketplace and applications subcategory.

Figure 6: Omdia Universe ratings: IBM

OMDIA UNIVERSE VENDOR SUMMARY

IBM: Hybrid and Multicloud Management

LEADER
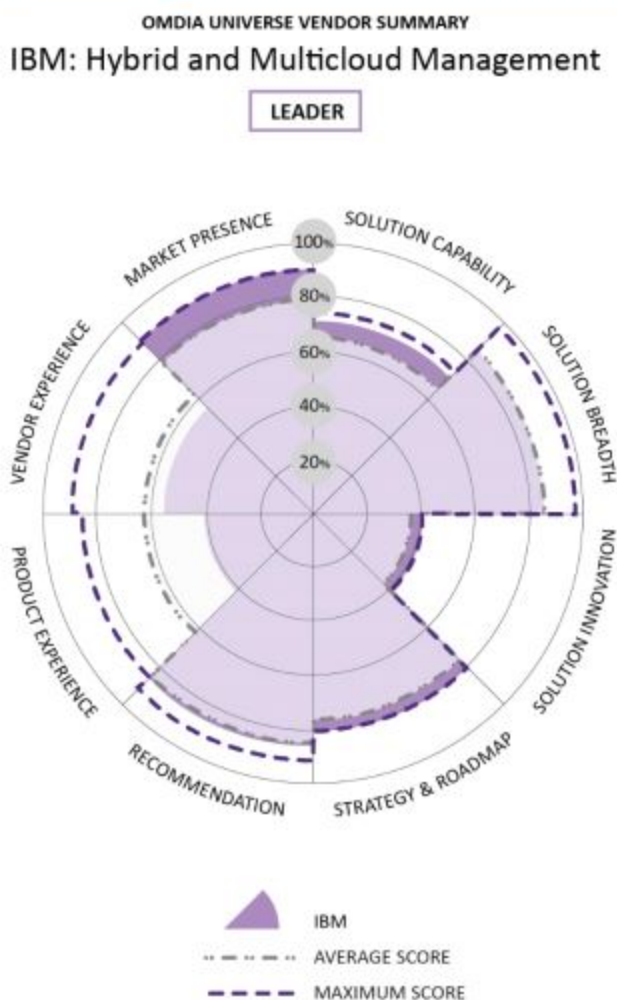
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Source: Omdia

Omdia considers the IBM Cloud Pak for Multicloud Management to be one of the most comprehensive solutions in terms of monitoring resource usage (compute, storage, and network). IBM provides detailed monitoring information such as CPU, memory, storage, network, and I/O usage information as well as monitoring of the hypervisor, the operating systems, and the container orchestration layer. Omdia was also impressed by the range of different environments that IBM monitoring supports; these include Linux KVM, VMware, Microsoft Hyper-V, Cisco UCS, OpenStack, Microsoft Windows OS, Linux OS, Unix, and Kubernetes orchestration platform. Omdia also notes that this support is consistent across on-premises and public clouds where applicable (e.g. bare metal). However, it is important to be aware that for those public clouds that offer a higher layer of IaaS, data collection is enabled via the public cloud interfaces. Omdia was particularly impressed by IBM's network monitoring capabilities, which provide network-related resource metrics and information for many different domains. The different capabilities include support for latency, error rate, traffic flow, and bandwidth saturation. Depending on the domain being monitored, the latency metrics will include analysis of network performance as they affect the operating system, clusters, pods, nodes, and so on. Omdia notes that IBM does not directly provide network monitoring for switches, routers, and so on. In these cases, the capability is provided through integration with many of the key network management tools. Using these integrations, customers are able to perform event correlation and

topological discovery and correlation, which enables organizations to understand how network problems are affecting application performance. In addition to the traditional hardware-based network infrastructure, IBM also manages cloud platforms and Kubernetes that utilize some variety of software-defined networking (SDN) such as nginx load balancers.

Omdia also rated IBM highly for its ability to manage cloud-native environments such as the Kubernetes orchestration environment. IBM enables this capability across many different public cloud Kubernetes platforms including Azure Kubernetes Service (AKS), EKS, GKE, IKS, and OpenShift in both public clouds and on-premises private clouds. IBM monitors cloud-native infrastructure (e.g., Kubernetes clusters) and monitors the Kubernetes native load balancing, which Omdia considers to be a demonstration of the depth of technical monitoring available. In addition, data usage and connections between nodes in the cluster are managed as are the application runtimes that are hosted on the Kubernetes-based platforms (e.g., Liberty, Node.js, Python, Go, and a generic J2SE monitoring capability).

IBM's second-strongest subcategory was lifecycle management and automation, where it recorded a score of 85%. IBM Cloud Pak for Multicloud Management Infrastructure Management has been designed to use various providers to perform deep discovery and collection of details of the resources in an agentless way. The discovered resources include VMs, clusters, datastores, hypervisors, cloud instances, images, security groups, networks, and availability zones. All the information about discovered resources is stored and maintained in a PostgreSQL database, which is continuously updated automatically. Omdia considers that the approach taken by IBM to automation in general is another key strength of the solution. IBM uses the concept of an Automate Framework that can be called as part of any workflow (e.g., provisioning) and uses shell scripts or Ansible Playbooks to deliver the automation.

The third-strongest subcategory for IBM was backup and resiliency, where it scored 80%. Omdia considered a strength to be the ability of the IBM solution to integrate with IBM Spectrum Protect Plus to deliver disaster recovery via data offload to both on-premises and cloud-based object storage, including support for physical and virtual tape. The solution provides centralized service- level objective (SLO) monitoring capabilities to monitor a service's latency and traffic to determine resiliency issues. Through an OEM agreement with Turbonomic, the solution provides a single sign-on into application resource management dashboards with recommendations and/or automated recommendations to improve resilience by moving applications to physical/virtual resources that are better performing.

IBM's weakness was its lack of a capacity planning capability or even an integration with a third- party capacity planning solution. Omdia considers that for a multicloud environment, capacity planning is a key consideration. IBM's other weakness was a lack of application release management, which considering the acquisition of Red Hat, is a surprise.

ManageEngine (Omdia recommendation: Prospect)

Products: CloudSpend, Site24x7

ManageEngine should appear on your short list because it has a strength in monitoring

In its first Omdia Universe, ManageEngine was classified as a prospect, with an overall average score across all three dimensions of 57.3% (see Figure 7), which was just outside the challenger classification (60–71.99%). ManageEngine's strongest subcategories were monitoring (78%), reporting and integration (66%), and customer experience (72%). ManageEngine's weakest subcategory was operational management (25%). Overall, Omdia believes ManageEngine has a good solid set of capabilities that scored nearly 50% across all the capability subcategories, while its customer experience score indicates that its customers consider it to represent value for money.

Figure 7: Omdia Universe ratings: ManageEngine

OMDIA UNIVERSE VENDOR SUMMARY

ManageEngine: Hybrid and Multicloud Management

PROSPECT
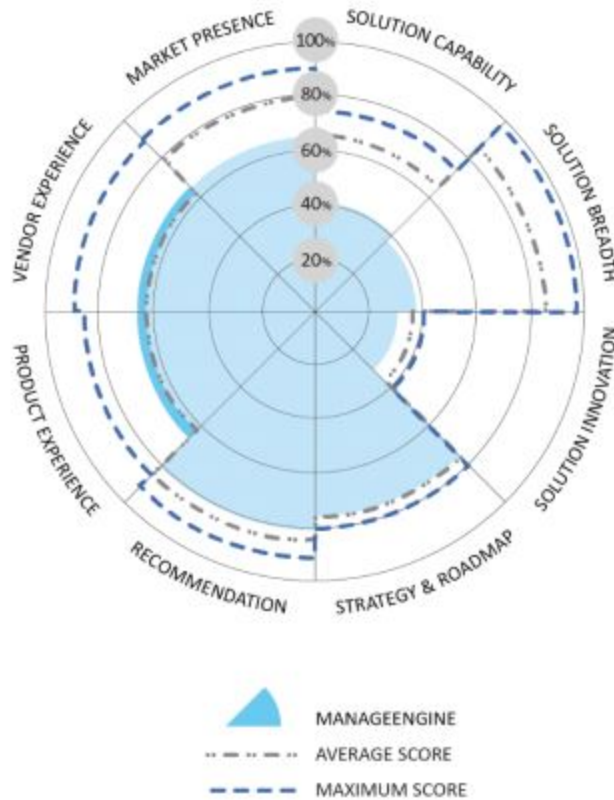
Source: Omdia

ManageEngine scored well for its monitoring capabilities. Omdia considers its ability to monitor resource usage metrics for both VMs and containerized workloads to be a significant strength. ManageEngine's two different deployment options (on-premises and SaaS) use different approaches to monitoring. The on-premises solution is an agentless "pull" approach to monitoring, while the SaaS product uses host agents and "pushes" information. ManageEngine tracks a wide range of technical metrics including CPU utilization, CPU usage, CPU idle time, Interrupts/sec, CPU utilization of cores, memory utilization, consumed memory, active memory, overhead memory, reserved memory, shared memory, granted memory, swapped memory, heap memory, VM kernel memory, and ballooned memory. Omdia liked the fact that ManageEngine supports monitoring for all major cloud providers such as AWS, Azure, GCP, Oracle Cloud, and Alibaba. ManageEngine also has in- depth support for containerized platforms (AWS AKS, Azure AKS, and GKS) and AWS Lambda and Azure function support for serverless technologies. For tracking storage usage, ManageEngine again makes use of metrics such as disk usage, disk I/O, commands aborted, bus resets, capacity, used, free, free space percentage, read rate, write rate, read latency, and write latency, available in both the on-premises and SaaS versions.

ManageEngine also scored well in the reporting and integration subcategory despite its lack of government accreditation and the fact that it does not use the concept of blueprints. Omdia considers the predefined reporting capabilities, which include availability reports, performance reports, trend analysis, and forecast reports, to be noteworthy capabilities. These reports are available for all the applications and infrastructure elements that are monitored by the ManageEngine solution. Log analytics and management is provided through Applogs, while Log360 gives full analytics and management capabilities for any type of log file. Applogs collects a wide range of different log-file types from servers to applications logs. ManageEngine also collects cloud logs and uses an agent-based approach for log-file data collection used by the DevOps team for problem identification and resolution. A third solution, Logs360 management, has the capability to collect logs related to security, compliance, and auditing. However, ManageEngine's biggest strength in this subcategory is its use of AI and ML for identifying anomalies in the monitoring data. The data model has self-learning capabilities and takes account of seasonality, which is used to normalize the data to avoid false alerts. ManageEngine also makes use of its natural language processing (NLP) capabilities in a chatbot for DevOps that works with Microsoft Teams and can be used in other collaboration tools.

ManageEngine's customer experience score was in the top three of the cohort and was significantly influenced by the 81% "likely to recommend" score it received on TrustRadius and by its well-defined strategy for the product. ManageEngine's weakest subcategory was operational management: it has very little capability in the current release. However, in Omdia's opinion, ManageEngine is focusing on the correct future capabilities, because while operational management is currently worthy of being a separate subcategory, it is likely to become less significant as service management becomes more prevalent. Therefore, in future Universes, the capabilities where ManageEngine is currently weak will become lower weighted and will be replaced by higher-order management features.

Microsoft (Omdia recommendation: Leader)

Products: Azure Automation, Azure Advisor, Azure Backup and Azure Site Recovery, Azure Lighthouse, Azure Migrate, Azure Monitor, Azure Portal, Azure Resource Manager, Azure Arc, Azure Stack, Azure Cost Management

Microsoft should appear on your short list because of its strong financial management capabilities

Microsoft is classified as a leader with an average score of 72.81% (see Figure 8), which is 7.99% below the overall leader. Microsoft was strong in some key capabilities, but overall, Microsoft's performance was consistent, with only a 12% variation between the core capabilities. Microsoft's strongest subcategories were financial management (76%), public cloud management (73%), and private cloud management (72%). Microsoft's weakest subcategory was monitoring (64%); this was a relative weakness because its performance was still above the average.

Figure 8: Omdia Universe ratings: Microsoft

OMDIA UNIVERSE VENDOR SUMMARY

Microsoft: Hybrid and Multicloud Management

LEADER

MICROSOFT

AVERAGE SCORE

MAXIMUM SCORE
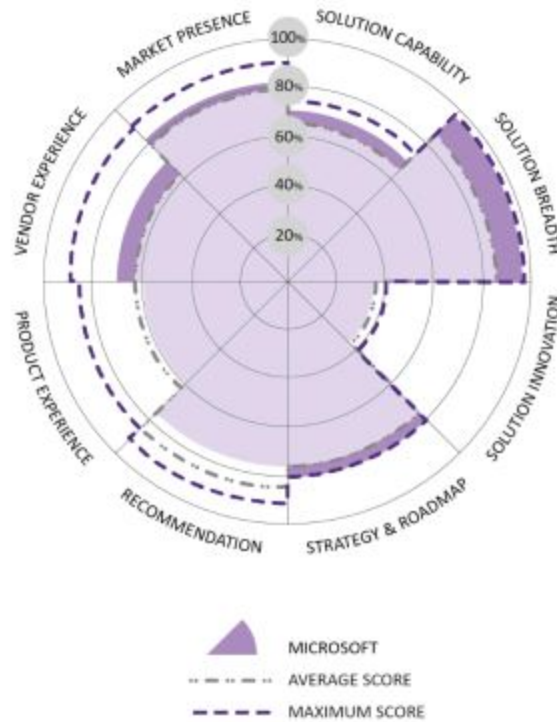
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Source: Omdia

Omdia considers that the performance of Microsoft's financial management capabilities is due to a number of key features. In Microsoft Azure, the Cost Management module provides a view of organizational cost and usage patterns by using inbuilt analytics. Users can select a range of reports that show the usage-based costs consumed by Azure services and by third-party marketplace offerings. This ability to show both Azure costs and other costs is a strength of Microsoft's solution. Microsoft states that the calculations are based on negotiated prices and factor in reservation and Azure Hybrid Benefit discounts, which is good for the Azure usage, but it is less clear on how this works for third-party products. While the reports show internal and external costs for usage and Azure Marketplace charges, they do not include other charges such as support and taxes, which are not currently included in the calculations. Customers can see the reservation purchases in the reports and have the ability to amortize those purchases over actual consumption to simplify cost showback needs when a reservation purchase benefit is shared by multiple subscriptions. Microsoft also provides predictive analytics and uses Azure management groups, budgets, and recommendations to show clearly how an organization's expenses are organized and how they might be reduced. Omdia likes the ability to use the Azure portal or various APIs to export and integrate cost data with external systems and processes. Automated billing data export and scheduled reports are also available.

In terms of public cloud management, Microsoft with Azure Arc (which at the time of writing was in preview) provides a single operational control plane for any resource (servers, Kubernetes clusters, SQL databases, etc.) type in any cloud. Arc works for both Linux and Windows VMs, for bare-metal deployments,

and for Kubernetes or cloud-native containerized workloads. Arc is also integrated with Azure Lighthouse for MSPs to extend it potential audience. Omdia considers that the fact Arc supports multiple different public clouds and provides a single common user experience across all the environments to be another strength. Arc provides a good governance and control capability that enables enforcement of policies for any infrastructure, anywhere. Omdia considers the compliance visibility capability of Arc to be noteworthy because compliance in a cloud environment is an issue that many organizations are beginning to identify as a challenge. Other capabilities that contributed to Microsoft's score in the public cloud subcategory include

- Its integration with GitHub, Azure Monitor, Azure Update, and other operational tools

- The fact that it is agnostic to the developer tools

- Support for templates to automate repeatable deployment of infrastructure as code

- Use of groups to organize assets

Microsoft was also strong in terms of private cloud management with its Azure Stack portfolio of solutions:

- Azure Stack Hub. Azure Stack Hub extends Azure to an on-premises environment, effectively delivering Azure services (Azure IaaS services and select PaaS services) in an organization's private data center. Omdia considers that Azure Stack Hub demonstrates its value to developers by delivering the cloud-native development environments on-premises.

- Azure Stack HCI. Azure Stack HCI is a hyperconverged Windows Server 2019 cluster that uses validated hardware to run virtualized workloads on-premises. Microsoft scores well in a number of subcategories with the capabilities offered by Azure Stack HCI, for example, the ability to connect to Azure services for cloud-based backup, site recovery, and so on that provides a flexible solution in terms of data protection in cloud environments.

- Azure Stack Edge. Microsoft's Azure Stack Edge solution scored well in terms of delivering a cloud-managed appliance for AI/ML workloads. The ability to leverage graphics processing units (GPUs) and field-programmable gate arrays (FPGAs) in the hardware to speed up inference learning at the edge was a significant capability worthy of note.

Microsoft's weakest capability was monitoring, but its performance was still impressive because it could monitor VMs and containerized workloads. Omdia considered monitoring to be a complex mixture of different services such as Azure Monitor Application Insights, Azure Monitor for Networks, and so on.

The different services have different roles: the purpose of Azure Monitor for Containers is to monitor not containerized workloads but the clusters and the container infrastructure itself; Application Insights is the feature to monitor the containerized workloads; Azure Monitor collects all Kubernetes event logs and containers logs from both Windows and Linux containers, which power the insights and analytics. However, the contextual insights are not coming from different solutions. Rather, Azure Monitor has one agent, one metric, one log, one alert, and one workbooks experience, which are the same across resources/technologies. Features such as Azure Monitor for VMs and Azure Monitor for Containers are basically just providing out-of-the-box insights, diagnostics, and visualizations on top of the data, which customers can correlate and analyze on their own or by using Log Analytics. Omdia likes the approach taken by Azure Monitor of having two fundamental types of data collected, metrics and logs. Metrics are numerical values that describe some aspect of a system at a particular point in time. Logs contain different kinds of data organized into records with different sets of properties for each type.

The flexibility of Microsoft's approach is both a strength and a weakness. Omdia liked the fact that Microsoft could extract insights from this data, but the fact that Microsoft has different solutions for

different technologies was seen as a potential barrier. For example, Azure Monitor for containers is a feature designed to monitor the performance of container workloads deployed to managed Kubernetes clusters hosted on AKS. It provides performance visibility by collecting memory and processor metrics from controllers, nodes, and containers that are available in Kubernetes through the Metrics API. However, Azure Monitor for VMs is needed to monitor Azure virtual machines. Having different solutions is, in Omdia's opinion, potentially confusing to a customer. For example, it is the Azure Log Analytics agent that collects telemetry from Windows and Linux virtual machines in any cloud, on-premises machines, and those monitored by System Center Operations Manager and sends the collected data to the Log Analytics workspace in Azure Monitor. The Log Analytics agent also supports insights and other services in Azure Monitor such as Azure Monitor for VMs, Azure Security Center, and Azure Automation.

Oracle (Omdia recommendation: Leader)

Products: Oracle Enterprise Manager, Oracle Cloud (services covering management, observability, security, database, application development, and marketplace)

Oracle should appear on your short list because of its strong automation capabilities

Figure 9 shows the high-level performance of Oracle, which is classified as a leader in the hybrid and multicloud universe with an average score of 72.51%. Oracle was joint leader in the capability dimension with an average score of 73%, which demonstrates the consistency of Oracle's performance. Oracle's strongest capabilities were in the lifecycle and automation (87%), marketplace and applications (81%), and security management (80%) subcategories. Its weakest capability was service modeling and financial management (54%).

Figure 9: Omdia Universe ratings: Oracle

OMDIA UNIVERSE VENDOR SUMMARY

Oracle: Hybrid and Multicloud Management

LEADER
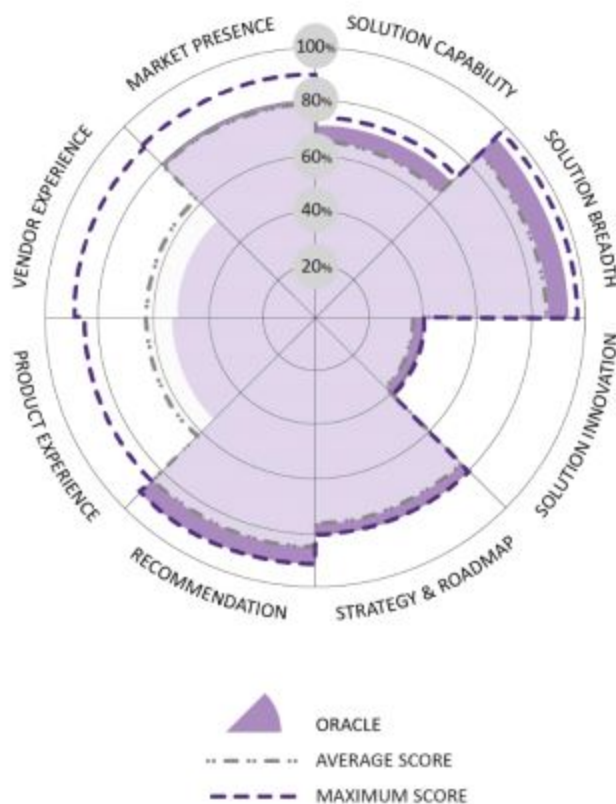
Source: Omdia

Automation is a key strength of Oracle and runs through a number of the subcategories. Oracle Cloud provides two defined autonomous services: Autonomous Database and Autonomous Linux. The Oracle Autonomous Database Cloud (OADC) is a new concept that Oracle introduced in 2018/19. The OADC is built using AI and ML and is designed to improve availability while reducing the cost of managing these complex assets. Initially, the OADC provided a solution for data warehouse deployments; it was then expanded to cover OLTP, NoSQL, and Graph use cases. The core premise of OADC is to transform the way databases are managed when they move to cloud to improve some challenging operational activities such as tuning databases to ensure optimum performance, patching and updating databases to ensure security and compliance, and autoscaling databases to meet business demand.

Omdia considers the integration of any management solution to the service desk to be a critical capability. While it is not a capability that many see as initially significant, its importance becomes obvious as organizations begin to consider the day two activities. At this stage, service desk integration is a business imperative if service quality is to be maintained and measured. Service desk integrations provided by Oracle include sharing data with Jira, Slack, ServiceNow, Grafana, BMC Remedy Service Desk, CA Service Desk, HP

Operations Manager, HP Service Manager, IBM Tivoli Netcool/OMNIbus, and Microsoft Systems Center Operations Manager.

Oracle's strength in marketplace and applications was due to a combination of capabilities. Oracle delivers a number of different solutions that can be used to deliver the marketplace capabilities required. The weakness of Oracle's approach was that it is predominantly an Oracle marketplace solution, but the addition of the Oracle Cloud Registry is beginning to change that approach. Oracle Cloud Console has a capability that enables customers and partners to create, edit, and configure listings in the Oracle Cloud Marketplace. Omdia notes that the generation of listings requires Oracle approval before they are publicly accessible. Omdia liked the capabilities provided by Oracle Cloud Registry, which provides access to a Docker Registry for public and/or private use. Oracle also provides Oracle Linux Container Registry, which is accessed from inside Oracle Linux, placing the control in the hands of developers. The overall marketplace capability that Oracle Enterprise Manager provides is access to a private cloud marketplace via a self-service portal.

In terms of making the marketplace simple and easy to use and manage, the use of automation is key. Oracle Cloud performs automation based on Terraform and Resource Manager Stacks, which can be integrated with other DevOps toolsets such as Hudson, Jenkins, Puppet, and Chef. One of the options available with Oracle is customer-managed environments. In these environments automation can be delivered in two ways:

- Oracle Enterprise Manager Patch Plans offer a quick, easy, and reliable patching mechanism that is facilitated using patch plans in Cloud Control.

- Ksplice updates the Linux OS kernel and key user space libraries while the OS is running, without a reboot or any interruption.

Both of the options can be invoked by external DevOps tool sets using different interface approaches such as, for example, APIs or command-line interfaces (CLIs).

Oracle's third-biggest strength was its security management capabilities. The key to Oracle's strength is the approach it takes to security. Oracle engineers security into its platform and provides security in depth. It is how these security capabilities are surfaced that enables Oracle to score above the cohort average. Omdia liked the fact that Oracle provides a wide array of security-specific offerings with each of its technology solutions. For example, database security is provided via the various security options such as transparent data encryption, audit vault, database firewall, and data masking. Oracle Enterprise Manager provides configuration and compliance management, which can be used as part of a comprehensive security posture activity. Identity and access management is provided by Oracle IdM on-premises and Oracle Identity Cloud Services in Oracle Cloud. Oracle also provides additional comprehensive capabilities in Oracle Cloud for intrusion detection, distributed denial of service (DDoS) mitigation, identity and access management, threat detection, key management, and so on.

Oracle's weakest capability was service modeling and financial management. Oracle's solution is aimed at the IT operations team, and the financial information provided is limited to the information needed by this team. One key weakness is Oracle Enterprise Manager's chargeback function, which can contain general ledger information, but this is manually entered by administrators. The ability to show comparative cloud cost is also missing from Oracle's solution. However, Omdia accepts that a cloud provider showing cross-cloud cost management data might not be a trusted source of information: customers are seeking an independent perspective on cloud costs.

ServiceNow (Omdia recommendation: Challenger)

Product: ITOM Operator Enterprise

ServiceNow should appear on your short list because of its strength in process automation and financial management

Figure 10 shows the high-level performance of ServiceNow, which in its first Omdia Universe on hybrid and multicloud management is classified as a challenger with an overall score of 67.53%. ServiceNow performed well in reporting and integration (85%), marketplace and application monitoring (77%), and lifecycle and financial management (72%); its weakest subcategory was backup and resiliency (50%). Overall, ServiceNow performed well and demonstrated some significant customer experience–related strengths compared to the more traditional management vendors. However, it lacked some capabilities that prevented it from being classified as a leader. Omdia believes that the market in hybrid and multicloud management is moving much more toward a services-centric management capability and considers the market to be moving to ServiceNow's position.

ServiceNow focuses ITOM in three key areas, visibility, health, and optimization, and leverages the ML capabilities of the platform. Omdia liked ServiceNow's concept of the "catalog item," which is used to create deployment templates. ServiceNow is continuing to build out these capabilities and currently offers 50 such catalog items, which are located on its developer site (formerly share.servicenow.com). Organizations can use these to accelerate customer deployments and perform a number of different actions in a single process flow. For example, a process might involve some preprovisioning and postprovisioning orchestration activities, and these might require different tools. ServiceNow enables multiple tools to be used in a single process flow such as using a CloudFormation template and two postprovisioning processes that run an Ansible script followed by a Chef-based configuration service in AWS. This ability to support a mixture of different tools and different environments is critical when managing in a multicloud environment.

However, it is in the way information is shared and made available that ServiceNow demonstrates its value compared with the competition. ServiceNow listens to its customers, which reported a need for a templated approach to using information from external sources such as Terraform, AWS CFT, Azure ARM, or GDM for Google. This information can then be used in conjunction with internal data such as project codes and change records. ServiceNow is known for its low-code process workflow generation capabilities, and customers can use this capability to automate the setup of tags and other governance actions. The service catalog is where the different elements are brought together into a consumable offering. To accelerate the time to value, ServiceNow uses the concept of recipes that can be configured to meet user requirements.

ServiceNow was also strong in its approach to identifying out of compliance in any environment. ServiceNow uses the concept of event aggregation from other platforms such as Splunk, Dynatrace, or AWS CloudWatch. It then employs its Operational Intelligence anomaly-detection feature set to raise alerts. These alerts can trigger automated responses that include remediation workflows run on ServiceNow's platform, internal scripts, or external URLs. Omdia notes that the recent Loom acquisition and newly announced Agent Collector will enhance automation capabilities. The acquisition of Loom Systems provides ServiceNow with a much-needed log-file capability, which, combined with ServiceNow's other data sources, enables deeper insights to be discovered.

However, Omdia considers financial management to be ServiceNow's biggest strength, although in the Universe these capabilities are split between a couple of the subcategories, which is why ServiceNow does not appear as a subcategory leader. ServiceNow uses its Cloud Insights feature to visualize all the costs

associated with AWS and Azure cloud usage. Cloud Insights uses the billing data provided by AWS and Azure on a configurable interval; this is typically hourly or daily depending on the level of granularity. ServiceNow uses a policy engine to identify cost-saving opportunities; these policies are fully configurable by the customer to meet their specific requirements. If Cloud Insights identifies resources that can be terminated, it alerts the Change Management process in ServiceNow. Omdia particularly likes the ability to allocate "owners" to services and set cost thresholds so that the owner of the service receives the alerts directly. This approach encourages more responsibility for the service usage and also means action can be taken early to avoid any penalty charges being applied.

ServiceNow's weakest subcategory was backup and resilience because there was no native backup capability. Backup can be supported but requires the user to add the capability in IntegrationHub, although a number of vendor plug-ins are available to accelerate adoption. ServiceNow does provide a disaster recovery (DR) capability and offers resiliency in the form of support for paired data center facilities.

Figure 10: Omdia Universe ratings: ServiceNow

OMDIA UNIVERSE VENDOR SUMMARY

ServiceNow: Hybrid and Multicloud Management

CHALLENGER
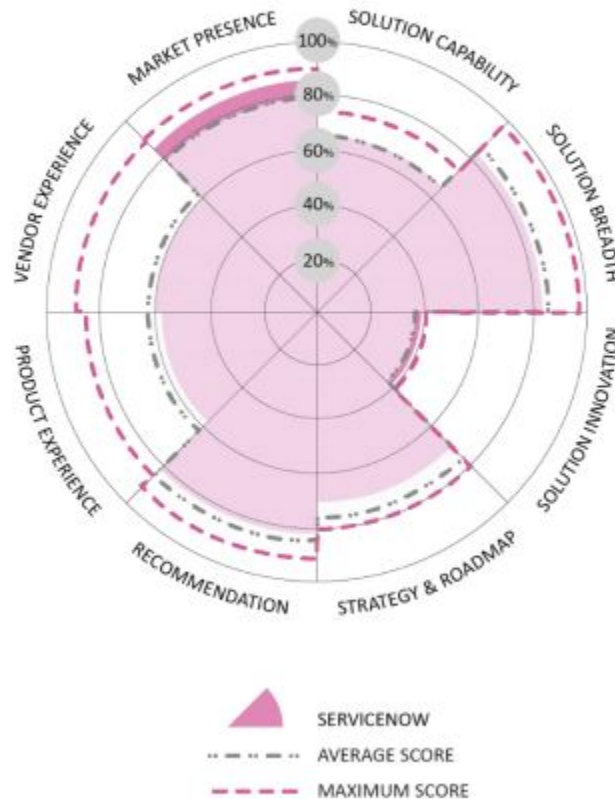
Source: Omdia

VMware (Omdia recommendation: Leader)

Products: vRealize Suite, Tanzu Observability by Wavefront, CloudHealth, Skyline

VMware should appear on your short list because it was the clear leader in all three dimensions of the universe

For the second successive report on hybrid and multicloud management, VMware was the clear leader. Figure 11 shows the high-level performance of VMware, which scored an average across all three dimensions of 80.80% and was the only vendor to score an average of above 75%. VMware scored an average of 73% in the capability dimension, 90% in market impact, and 87.48% in customer experience. VMware's capability strengths were backup and resiliency (85%), monitoring (85%), and lifecycle and automation (81%); its weakest capability was security management (65%).

Figure 11: Omdia Universe ratings: VMware

Source: Omdia

VMware's ability to monitor scores highly because of a combination of capabilities. In terms of monitoring the core resources, vRealize was able to monitor and to take action on a wide range of metrics. VMware vRealize's capabilities covered CPU, memory, storage, and network metrics for VMs and containers. VMware also takes into account dynamics such as limits, reservations, availability, and so on. The breadth of coverage for both VMs and containers was considered to be one of the most comprehensive in the report.

For example, vRealize provides a complete monitoring solution for all storage whether presented to VMs or containers. The solution monitors and takes into account reserved/used/allocated storage, latency and read/write ratio. Management packs for third-party storage solutions can extend vRealize to assure the health of arrays, logical unit numbers, and even individual HDDs. vRealize also supports health monitoring for a number of AWS, Azure, and GCP services. Capabilities of vRealize in network monitoring include the ability to measure metrics such as input/output operations per second, latency, dropped packets, and so on. Omdia considers the ability to perform physical-to-physical, virtual-to-virtual, and virtual-to-physical path diagnostics to be a noteworthy capability, particularly as these capabilities provide support for virtual networking and security devices.

VMware's vRealize provides cost and capacity management for vSphere-based private cloud or for the VMware stack running in public clouds such as VMware Cloud on AWS, while CloudHealth by VMware is the solution for public clouds. In the public cloud management and financial management space, CloudHealth provides a SaaS solution focused on helping organizations optimize, govern, and secure their public cloud environments. Nearly two years since its acquisition, CloudHealth has seen significant growth as part of the VMware portfolio and now manages more than $12 billion of public-cloud spend annually worldwide. Recently, CloudHealth brought to market the innovative FlexOrgs feature, which enables large distributed enterprises to effectively manage their distributed cloud environments by delegating and empowering the lines of the business. Integration between CloudHealth and vRealize Operations can bring public-cloud data into vRealize for a unified view.

VMware's newest capabilities are in the cloud-native space, where its Tanzu solution was launched to provide much-needed support for this sector. Tanzu Observability by Wavefront (Tanzu Observability) is a full observability and monitoring solution for cloud-native applications including serverless, Kubernetes, service mesh, and so on. Omdia likes the fact that Tanzu Observability comes with more than 220 out-of-the-box integrations with the most commonly used cloud-native technologies. Omdia rated VMware highly for its ability to support multiple different service-mesh technologies. Tanzu Observability platform supports integrations with popular service-mesh implementations including AppMesh, Envoy, and Istio. With a zero-configuration installation, Tanzu Observability by Wavefront delivers immediate observability into all Kubernetes environments (VMware Tanzu Kubernetes Grid, VMware Tanzu Mission Control, Red Hat OpenShift, etc.) and autodiscovered Kubernetes workloads. This cloud-native capability is extended using vRealize Operations and vRealize Automation to monitor and provision the infrastructure supporting Kubernetes. The vRealize solution comes with out-of-the-box integration with vSphere 7 with Tanzu, which is expected, but also extends the monitoring to container management platforms such as OpenShift and VMware Tanzu Kubernetes Grid or to any conformant Kubernetes distribution with management packs. VMware has continued to build out its management capabilities: vRealize has more than 180 management packs to extend its monitoring capabilities into other technologies such as hardware, OS, applications, and public clouds, and Tanzu Observability by Wavefront has more than 220 integrations. Omdia scored VMware highly for this ability to extend the solution to popular third-party products that organizations are already using.

In the backup and resiliency subcategory, VMware includes a DR management solution, which uses an automated policy-based approach. However, the solution from VMware is predominantly targeted at protecting virtual machines in a vSphere environment. Omdia considers it to be a simple and easy-to-use capability that enables organizations to use it for multiple different use cases such as DR, disaster avoidance, planned data center migrations, site-level load balancing, or even application maintenance testing. Omdia rated highly the ability to migrate protected workloads and services from one site to another through a single recovery plan that specifies the order in which VMs are shut down and started up, the resource pools to which they are allocated, and the networks they can access. Omdia's note of caution is

that this only applies to VM-based workloads, which are currently the dominant type of workload, although this is beginning to change as more cloud-native applications move to production environments. Another strength of the VMware solution was its ability to test recovery plans using a temporary copy of the replicated data and isolated networks in a way that does not disrupt ongoing operations at either site. The solution supports the use of multiple recovery plans that can be configured to migrate individual applications or entire sites. Omdia considers that this granular control enables flexible testing schedules because organizations can perform testing to meet different scenarios.

VMware's capabilities in the lifecycle and automation subcategory were, for the most part, in line with those of the other vendors. However, it was in automation that VMware scored highly. It uses a variety of approaches to deliver automation:

- Dynamic thresholds are used to detect abnormal behavior, which can be used to trigger automated remediation actions.

- AI-based analytics are used to automate workload performance optimization, moving workloads between clusters based on utilization, capacity, business intent, and operational intent and even right-sizing workloads.

- Predictive VMware DRS provides intelligent analysis of workload behavior to predict potential resource bottlenecks and activate live migrations ahead of time to avoid performance issues during peak activity.

- AI-based capacity analytics can predict how much capacity is left, how soon it will run out, and what reclamation actions can be taken to reduce waste and cost. It can also help model multiple future scenarios, such as for additional projects, hardware refresh, or public cloud migration.

VMware's weakest capability was security management, but this was still above the average for the cohort. Like most of the other vendors, its main weakness for this report was the lack of encryption and key management capability. VMware provides encryption and key management by using third- party providers. Omdia considered VMware's CloudHealth Secure State capabilities and its ability to work with both AWS and Microsoft Azure to be noteworthy capabilities. CloudHealth Secure State capabilities provide cloud security and compliance monitoring that helps organizations detect and remediate misconfigurations.

Methodology

Omdia Universe

The process of writing a Universe is time consuming:

- Omdia analysts perform an in-depth review of the market using Omdia's market forecasting data and Omdia's ICT Enterprise Insights survey data.

- Omdia creates a matrix of capabilities, attributes, and features that it considers to be important now and in the next 12–18 months for the market.

- Vendors are interviewed and provide in-depth briefings on their current solutions and future plans.

- Analysts supplement these briefings with other information obtained from industry events and user conferences.

- The Universe is peer reviewed by other Omdia analysts before being proofread by a team of dedicated editors.

- Analysts derive insights on the customer experience with each solution via reviews and ratings on TrustRadius.

Omdia ratings

- Market Leader. This category represents the leading solutions that Omdia believes are worthy of a place on most technology selection short lists. The vendor has established a commanding market position with a product that is widely accepted as best of breed.

- Market Challenger. The vendors in this category have a good market positioning and are selling and marketing the product well. The products offer competitive functionality and good price-performance proposition and should be considered as part of the technology selection.

- Market Prospect. The solutions in this category provide the core functionality needed but either lack some advanced features or suffer from a low customer satisfaction rating.

The scoring for the Universe is performed by independent analysts against a common maturity model, and the average score for each subcategory and dimension is calculated. The overall position is based on the weighted average score, where each subcategory in a dimension is allocated a significance weighting based on the analyst's assessment of its relative significance in the selection criteria.

Inclusion criteria

There are many vendors in the IT management market offering solutions to customers of all sizes. However, inclusion in this Universe is based on the vendor's ability to offer solutions specifically for the hybrid and multicloud management aspects of data center management. All the vendors have verified the accuracy of the data. As is typical with these projects, some vendors are unable to meet the strict deadlines for the return of submissions so decline to participate.

The criteria for inclusion of a vendor in the Universe for Hybrid and Multicloud Management, 2020– 21 are as follows:

- The vendor must be a global vendor with customers in all of three regions: Asia Pacific; Europe, the Middle East, and Africa; and North America.

- A solutions vendor must offer cloud management capabilities that enable the management of platforms/infrastructure other than its own technology.

- A software vendor's solution must be capable of managing more than just server virtualization. It must cover at least three of the four main areas (compute, storage, network, and applications).

- The vendor must have at least 250 customers, and they must be a mix of midsize enterprises (1,000–4,999 employees) and large enterprises (5,000-plus employees).

Exclusion criteria

The hybrid and multicloud management market is considered a new and evolving management market, and Omdia accepts that some vendors have entered this market from different backgrounds such as

infrastructure management, services management, or cloud. Vendors and products are excluded from the analysis according to the following criteria:

- The vendor's solution is only applicable to five of ten different classifications in the capability dimension: monitoring, private cloud management (server, network, storage, I/O), public cloud management, service modeling and financial management, operational management (scale, delivery, provisioning), security management (DevSecOps), backup and resiliency, lifecycle management and automation, reporting and integration, and marketplace management.

- More than 50% of the vendor's solution is made up from partner solutions or third-party solutions.

- The vendor has no direct contact with the end customer; everything is done through channel partners.

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