CRISP VENDOR UNIVERSE / 2018

VENDOR UNIVERSE

CLOUD COMPUTING VENDOR & SERVICE PROVIDER COMPARISON

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Research Report
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crisp RESEARCH

FOREWORD

Dear Reader,

the days of companies taking a half-hearted approach to Cloud Computing are over. The topic has well and truly arrived, not only in the minds of executives, but also within the IT infrastructures of their organizations. Influenced by the ever-increasing pressure to reorient their IT to the realities of the digital economy and stay competitive, companies are now building comprehensive Cloud architectures.

Numerous new trends, from the Internet of Things and Machine Learning, to Artificial Intelligence and running applications based on container technology, are being implemented within organizations everywhere. In reality however, most companies will find it hard to keep pace with the latest developments.

Fortunately, an increasing proportion of open source elements within the Cloud and IT infrastructures will at least give them the opportunity to remain flexible and agile over the long term. This will enable them to adapt to the latest advances from the innovation leaders.

What remains is the challenge of making the right decisions in what is effectively a new market and technology environment. In this context, several helping hands are required to write a successful Cloud story. We have set ourselves the task of giving organizational decision-makers a guide making those key decisions by analyzing the most important markets and spheres of activity in the Cloud environment.

The result is our latest Crisp Cloud Computing Vendor Universe, which examines within five relevant Cloud markets exactly which vendor trends are the most important, which aspects users should pay particular attention to, and which technology vendors and service providers are setting the standards as thought leaders and key players.

Enjoy the report!

Dr. Carlo Velten
CEO, Crisp Research

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INTRODUCTION

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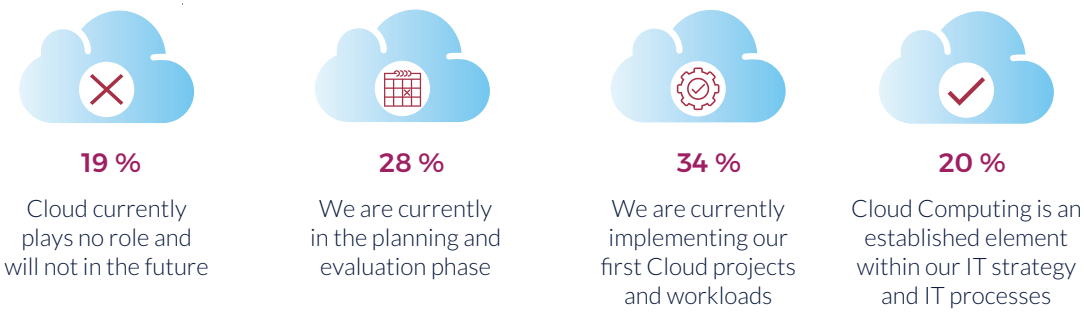
MARKET OVERVIEW

The Cloud is becoming a socio-economic issue. The reason: the gap between Cloud users and non-users is getting bigger and bigger. The number of companies that have firmly established Cloud Computing as part of their IT strategy is growing daily. Nevertheless, there remains a strong core of companies that use the Cloud, preferring to adhere strictly to existing on-premise models. So, while companies that have worked out their Cloud strategies, slowly start to scale up and run large workloads on the new infrastructures, their conservative peers are in danger of being left behind. Moreover, the retrogressive approach they are taking could soon come back to haunt them. After all, if the economy is largely dependent on digital infrastructure, companies that do not adapt could find themselves excluded. At least four out of five companies are on the way to using Cloud Computing as an integral part of their IT. The remaining 19 percent of companies must now act quickly. This was the conclusion of a recent study by Crisp Research in cooperation with PlusServer. Over 80 percent of companies see the Cloud, which is primarily an IT operations issue, as an important initiative for the future. Indeed, new Cloud-based IT infrastructures are the backbone of digitization, ensuring that there are sufficient computing resources available to launch new IT projects, network the employees' workplaces, or analyze markets and customer buying behavior in real time. Not only that, Cloud Computing can also enable the control of entire production and value chains via a digital platform.

// What role does Cloud Computing (public, private, hybrid, multi) in your overall IT strategy?



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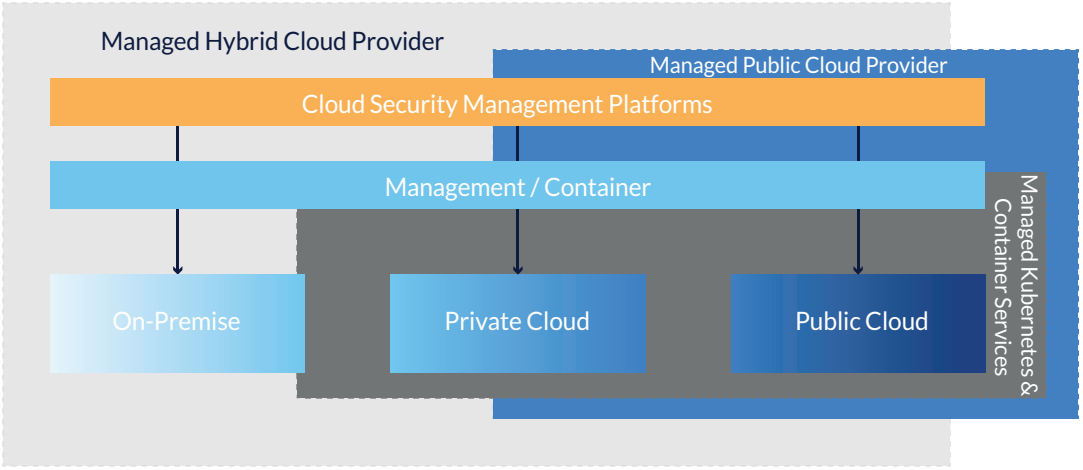
Importantly, it has already become clear in practice that Cloud Computing does not have to mean exclusive use of the Public Cloud. Definitions, interpretations, and real-world implementations are so versatile that Cloud Computing has become, in a more general sense, a collective term for new infrastructure models, application operation, and IT innovation. For this reason, the reality within organizations is referred to as Hybrid or Multi-Cloud, where multiple infrastructure deployments within IT are implemented, networked and integrated as needed. Here, companies now have a large selection of relevant Public and Private Cloud platforms and technologies to choose from. Seelcting and combining them mostly depends on the specific application and the requirements of existing systems. That's why the Cloud blueprint of German companies is difficult to standardize, a fact that certainly doesn't make implementation any easier or faster.

Despite the polyglot character of the Cloud in the corporate context, key innovations and development progress tend to come from the Public Cloud environment or, more specifically, from the Cloud infrastructure platform providers. The standards in terms of user experience, infrastructure management and new IT trends are often set here. While there are still privacy and compliance restrictions, and the difficulties of migrating individual workloads prevent the Public Cloud from becoming a universal infrastructure foundation, business adoption and relevance are evolving continuously. For Cloud-native workloads in general and for specific applications relating to the Internet of Things or Artificial Intelligence, the Public Cloud is the platform of choice, thanks to its flexibility, native developer services and micro-service character. In addition to a stable architecture and a high degree of user-friendliness, these are currently the most important parameters on which vendors compete.

At the same time, the complexity of Hybrid and Multi-Cloud infrastructures means that security is becoming ever more important. Businesses need to ensure that data traffic is safe, even within infrastructures that are not under their full control. In the best case, IT infrastructure security exists across all deployments and can be managed centrally. Only then is it possible to eliminate most of the potential security gaps that can be exploited by attackers or threaten the stability of the entire architecture. For this reason, numerous infrastructure security portfolios now exist that were developed specifically for Public, Hybrid and Multi-Cloud architectures. Even a cursory look at the vendors of these offerings reveals that most are existing security solutions that have been adapted to the needs of Cloud architectures.

Nonetheless, this is a necessary step to be able to operate a secure architecture over the long term, because almost every

// Service Provider Landscape



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organization needs to retrofit their landscapes. Even if the Cloud providers themselves ensure a high level of security within their own infrastructures, few Hybrid and Multi-Cloud architectures are already completely protected. The danger of losing one of the most important assets in today's digital economy is significant.

Responsibilities in the Public Cloud are, to a large extent, supposed to be shared with the customer (shared responsibility). However, since organizations are rarely able to meet their obligations, there are a large number of service providers who take on this task on their behalf. On the one hand, that's because many companies are not in a position to match the rapid innovation of the providers and build out their own Cloud architecture with their own teams. On the other hand, continuous operation is also too extensive and complex for many companies, so it takes the class of Managed Cloud Providers to supply end-to-end support with technology selection, implementation and optimization.

There are at least three relevant categories of Managed Cloud Providers that should be of interest to businesses:

- Managed Kubernetes & Container Service Provider
- Managed Public Cloud Provider
- Managed Hybrid Cloud Provider

Managed Public and Hybrid Cloud Providers have been around for some time, acting as partners for the operation of entire applications and Cloud infrastructures. But they are also subject to constant changes in market and competitive conditions. For a long time, the two categories of service providers were synonymous with one another. This is mainly because their core task, operational responsibility for Cloud infrastructures, is the same. However, over time it has become increasingly clear that these providers actually perform two different tasks.

On the one hand - and this is where the Managed Public Cloud Providers are in high demand - it's all about being responsible for the application operation of predominantly Cloud-native workloads on purely Public Cloud architectures. These are applications and workloads that have been developed directly in the Public Coud and have high flexibility, agility, and performance requirements. While existing workloads may also fall within the remit of Managed Public Cloud Providers and have high agility and flexibility requirements, this is usually the exception. Due to the increasing number of applications that fulfill these characteristics, the demand for Managed Public Cloud Providers is particularly high.

However, this is at least equally suitable to Managed Hybrid Cloud Providers. In contrast to the Managed Public Cloud Providers, most of them also have their own infrastructures. This is often necessary because they take over the operation of large parts of their customers' corporate IT and application landscapes. These providers, who usually come from the traditional outsourcing or integration markets, have to ensure the stable operation of this architecture and therefore rely on hybrid architectures and operations models. This illustrates how the tasks of the two service providers overlap, but also have crucial differences. In the meantime, these differences have become so significant that companies can clearly differentiate within the scope of their sourcing efforts which category of provider meets their requirements in each case best. As a result, Managed Public and Hybrid Cloud providers can also be separated from one another more easily, and analyzed in separate market categories without major overlaps.

In addition, we have added service providers in the area of Container Services and Kubernetes this year. These technologies have defined one of the most extensive application usage trends in the IT in the past 24 months. In fact, open source communities such as the Cloud Native Computing Foundation (CNCF), which is behind Kubernetes, have even launched their own partner and certification programs. The key partners involved, along with a number of technology providers, are vendors who have developed their own services based on Kubernetes to automate and simplify the management of container clusters. Since not all companies can create a container architecture on their own, despite all the available technology and automation, providers must also continue to support set-up and operation. This interaction characterizes the managed Kubernetes and Container Service Providers, who consequently focus on a very specific part of the Managed Cloud Services space.

Overall, it is clear that there is a lot of activity within the Cloud Computing market. The fact that the technology itself has become the new normal in many places should not blind us to just how much innovation and change is happening on an almost daily basis. The growing number of companies using the Cloud and the ever-changing stream of ideas and opportunities emerging from suppliers is making it difficult for many decision-makers to establish an overview of the relevant technologies, spheres of activity and providers in the market. The Crisp Cloud Computing Vendor Universe 2018 is designed to help decision makers identify the key trends and opportunities for their Cloud strategy, as well as gain an overview of who the key partners and vendors are in these competitive marketplaces.

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MARKET DEFINITIONS & VENDOR SELECTION

The market segments analyzed within the Crisp Cloud Computing Vendor Universe 2018 are:

- Cloud Platforms - Infrastructure as a Service & Platform as a Service
- Cloud Security Management Platforms
- Managed Container Services
- Managed Public Cloud Provider
- Managed Hybrid Cloud Provider

In order to ensure the comparability and clear definition of the categories and providers for IT decision-makers, specific selection criteria are defined both in general and for each category. These criteria determine the relevance and assessment scores of the respective providers. This methodology guarantees a reliable and clear basis for the decision in individual and market categories that are currently in much demand.

The general selection criteria are:

- German branch or active partnerships and availability of the offer (service / product available in Germany)
- A minimum of 1 reference project in the German market (also non-public / under NDA)

Specific selection criteria per category are:

Infrastructure as a Service & Platform as a Service:

- Offer compute, network, storage as base components
- API / interfaces - Integration opportunities provided by the platform
- Platform Services - standard services for individual tasks / workloads / development & monitoring tasks

Cloud Security Management Platforms:

- Offer IT security services to corporate customers
- Provision of solutions for securing (public / private / hybrid / multi) cloud architectures or infrastructures
- Support for Cloud platforms from different providers (no exclusive partnership or provider solution)
- Operation as a service or software at the customer, or via partnership with Cloud providers / managed service providers

Managed Public Cloud Provider:

- Services for the implementation and continued operation of Public Cloud services on third-party Public Cloud platforms
- Consulting, design, implementation, operation and ongoing support of customer systems, services and applications on Public Cloud platforms
- Public naming of partnerships with Public Cloud providers
- No white label approach based on partnerships with Public Cloud providers

Managed Hybrid Cloud Provider:

- Services for the implementation and continued operation of Public Cloud services on third-party Public Cloud platforms
- Consulting, design, implementation, operation and ongoing support of customer systems, services and applications on Public Cloud platforms
- Public naming of partnerships with Public Cloud providers
- Own data center or proven competencies / service descriptions for Managed Services On-Premise / Private Clouds

Managed Kubernetes & Container Services:

- Services for the implementation and ongoing operation of Container Services on third-party Public Cloud & infrastructure platforms
- Public naming of partnerships with Public Cloud and container technology providers
- Optional: Own container management platform-as-a-service

In the final evaluation, a total of 117 providers were included within the five categories.

Some of these providers have been evaluated in more than one category for a total of 107 technology and service offerings. A total of 48 of the 107 providers considered were ranked as leaders in service value creation and vendor performance, and therefore as Accelerators. This is mainly due to their provision of leading solutions in the field of Cloud Platforms and Cloud Security Management Platforms, as well as services in the Managed Container Services, Managed Hybrid Cloud Providers and Managed Public Coud Providers markets.

In addition, 19 vendors have been rated as Innovators because of to their product portfolios. They can be considered close to the market leaders, but without the power and ecosystem of the leading vendors to broaden their reach and scale.

The remaining 40 vendors in the lower two quadrants represent emerging market players who are not yet sufficiently mature in the market and / or in terms of size and penetration, and therefore may not yet be able to support customers and businesses optimally.

Based on the selection criteria defined above, the following vendors and service providers were subjected to further analysis and evaluation in this year's provider comparison:

- Cloud Platforms - Infrastructure as a Service & Platform as a Service
- Cloud Security Management Platforms
- Managed Container Services
- Managed Public Cloud Provider
- Managed Hybrid Cloud Provider

VENDOR & SERVICE PROVIDER FOR CLOUD PLATFORMS - IAAS & PAAS

1&1 Internet / ProfitBricks	Digital Ocean	Joyent	QSC
Alibaba	Dimension Data	Leaseweb	Salesforce
Amazon Web Services	Exoscale	Microsoft	SAP
Atos	Google	NTT DATA	SysEleven
Bechtle	gridscale	Oracle	Telekom
CenturyLink	Host Europe	OVH / vCloud Air	Vodafone
Cloud Foundry	Hyve	Pivotal	ZOHO
CloudSigma	IBM	Platform.sh	

Qualifed and rated Cloud Computing Vendors & Service Providers
After verifcation, non-qualifed Cloud Computing Vendors & Service Providers

VENDOR & SERVICE PROVIDER FOR CLOUD SECURITY MANAGEMENT PLATFORMS

AbacusNext	Cisco	Lacework	SecureLink
Akamai	Citrix	ManageEngine	7P
Aqua Security	Cryptzone	McAfee (Skyhigh)	Sophos
Atos	Dell	Micro Focus	Sumo Logic
Avanan	Dome9	Microsoft	Symantec
AVG	F-Secure	Netskope	Sysdig
Avira	f5	NeuVector	T-Systems
Axians	Forcepoint	Palo Alto Networks	Trend Micro
Barracuda	Fortinet	PAV (Panda Security)	Twistlock
bitglass	HyTrust	PROFI AG	vArmour
Centrify	IBM	proofpoint	Vera
Check Point	Ionic	Qualys	VWware
CipherCloud	Kaspersky Lab	RSA	WhiteHat Security
			Zscaler

Qualifed and rated Cloud Computing Vendors & Service Providers
After verifcation, non-qualifed Cloud Computing Vendors & Service Providers

VENDOR & SERVICE PROVIDER FOR MANAGED KUBERNETES & CONTAINER SERVICES

alauda.io	EasyStack	Loodse	SAP
Alibaba	EcOS	Mesosphere	Solano Labs
Apprenda	Giant Swarm	Microsoft	spotinst
Appscode	Hainan eKing	Mirantis	StackPointCloud
Baidu Cloud	Harmony Cloud	Netease	SUSE
BoCloud	Hasura	NeuVector	Sysdig Cloud
Caicloud	Heptio	Nirmata	Tencent Cloud
Canonical	Huawei	Oracle	TenxCloud
Claranet	IBM	Pivotal	Teutostack
Cloud Foundry	inwinSTACK	Platform9	Twistlock
Containership	Joyent Triton	PlusServer	weaveworks
DaoCloud	Kinvolk	Poseidon	Wercker
Diamanti	Kontena Pharos	Rackspace	Wise2C Technology
Docker Swarm Enterprise	Kublr	RedHat	Woqutech
DXC	Linode	Samsung	ZTE

Qualifed and rated Cloud Computing Vendors & Service Providers
After verifcation, non-qualifed Cloud Computing Vendors & Service Providers

VENDOR & SERVICE PROVIDER FOR MANAGED PUBLIC CLOUD PROVIDER

Accenture	BTC	Dimension Data	kreuzwerker	7P
Acentrix	CANCOM	direkt gruppe (IQ3 CLOUD)	Materna	Solvito
Adacor	Capgemini	DXC	MCON Germany	Sopra Steria
Adlon	CC-IT	Dynport	mhp	Stemmer
Akquinet	CenturyLink	ecocode	MT AG	Sysback
Alegri	Claranet	ETECTURE	Ngarroa	sysEleven
All for One Steeb	Cloudpilots	Freudenberg	Netlution	T-Systems
Allcloud	CloudReach	Fujitsu	Nexinto	Team Centric Software
Allgeier	Cloudwürdig	GIS AG	Nordcloud	Techedge Group
Anmatho	COC AG	gridscale	NTT Communications	TecRacer
APA IT	Codecentrix	Hollmann IT	PlusService	The Server Labs
ARS GmbH	Cognizant	Host Europe	QSC	The unbelievable machine company
Arvato Systems	Comparex	i.S.A. Dresden	Rachfahl IT	TimeToAct
Atos	Computacenter	IBM	Rackspace	Trivadis
Avanade	comSysto	Infosys	Realtech	VMware
Axians	Concat	innoQ	Reply	Zoi
Bearing Point	Controlware	Interoute	Retarus	Zühlke Engineering
Bechtle	CSF	Itelligence	Root360	
Beck et al.	diconium digital solutions	Janz IT	Sepago	

Qualifed and rated Cloud Computing Vendors & Service Providers

After verifcation, non-qualifed Cloud Computing Vendors & Service Providers

VENDOR & SERVICE PROVIDER FOR MANAGED HYBRID CLOUD PROVIDER

Accenture	BTC IT Services	diconium digital solutions	ITM	Sepago
Acentrix	CANCOM	Dimension Data	Janz IT	Seven Principles
Adacor	Capgemini	direkt gruppe (IQ3 CLOUD)	kreuzwerker	Solvito
Adlon	CC-IT	DXC	Materna	Sopra Steria
Akquinet	CenturyLink	Dynport	MCON Germany	Stemmer
Alegri	Claranet	ecocode	mhp	SunGuard
All for One Steeb	Cloudpilots	ETECTURE	MT AG	Sysback
Allcloud	CloudReach	Freudenberg	Nagarro	sysEleven
Allgeier	Cloudwürdig	Fujitsu	Netlution	T-Systems
Anmatho	COC AG	GIS AG	Nexinto	Team Centric Software
APA IT	Codecentric	gridscale	Nordcloud	Techedge Group
ARS GmbH	Cognizant	Hollmann IT	NTT Communications	tecRacer
Arvato Systems	Comparex	Host Europe	PlusServer	The Server Labs
Atos	Computacenter	i.S.A. Dresden	QSC	The unbelievable machine company
Avanade	comSysto	IBM	Rachfahl IT	TimeToAct
Axians	Concat	Infosys	Rackspace	Trivadis
Bearing Point	Controlware	innoQ	Realtech	Verizon
Bechtle	CSF	Interoute	Retarus	VMware
Beck et al.	Data Group	Itelligence	Root360	Zühlke Engineering

Qualifed and rated Cloud Computing Vendors & Service Providers

After verifcation, non-qualifed Cloud Computing Vendors & Service Providers

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EVALUATION CRITERIA

The evaluation criteria are divided into two main categories "Product / Service Value Creation" and "Vendor Performance", each with five subcategories. The subcategories include other characteristics that are weighted by percentage. The subcategories include more specific and individual characteristics that vary by market category.

Product or Service Value Creation focuses on the marketability of the respective product and portfolio. This includes:

Service / Product Portfolio: Service and scope, as well as the completeness of the portfolio.

Service / Product Experience: Service availability and service experience from a customer perspective. SLA offering, as well as additional value add for the user and/or admin experience.

Integration: Integrate capability in relation to back-end systems, third-party vendors, and within existing applications.

Economic factors: Value for money and contractual arrangements (e.g., risk sharing).

Disruption potential: Contributor / service provider's innovation contribution to providing customers with a competitive advantage, and new business and IT service models.

Service / Product Value Creation						
Features / Service Portfolio, e.g.	Infrastructure Services Platform Services Architecture Options Feature Set Hybrid & Multi Cloud Capabilities Portfolio Completeness Service Capabilities & Service Management Vendor Selection Management Services Technology Selection & Portfolio Platform Independency	25%	25%	25%	25%	25%
Service / Product Experience, e.g.	Service & Support Design Set Up & Onboarding Infrastructure Performance & Connectivity Operational Model Deployment Models Workload Variety Value-Adds (e.g. Management-Tools, cloud-native Development) Deployment Options & Data Center Value-Adds (e.g. Monitoring, Portal, Dashboard) Service & Process Design Admin Experience Testing Capabilities	25%	25%	25%	25%	25%
Integration, e.g.	APIs & API Documentation Management Hybrid & Multi Cloud Capabilities Integration Capabilities APIs Public Cloud Integration Templates / Blueprints Integration Experience Multi-Cloud-Integration APIs / Hybrid-/ Multi-Cloud-Integration Deployment Models Data Protection & Security Management	20%	20%	25%	15%	25%
Economics, e.g.	Cost & Capacity Management Pricing Model Business Model	15%	10%	10%	15%	15%
Disruptive Potential, e.g.	Next Generation Technology Portfolio New Business Creation Global Availability Zones AI & Automation Services Additional Customer Value Add Process Optimization Infrastructure & Optimization New Business Creation Business Consulting Digital Transformation Excellence Own Technology Portfolio	15%	20%	15%	20%	10%

Gewichtung für:

- Cloud Platforms - IaaS & PaaS
- Cloud Security Management Platforms
- Managed Kubernetes & Container Services
- Managed Public Cloud Provider
- Managed Hybrid Cloud Provider

Vendor performance examines the strategic orientation of the provider in the respective market segment and includes:

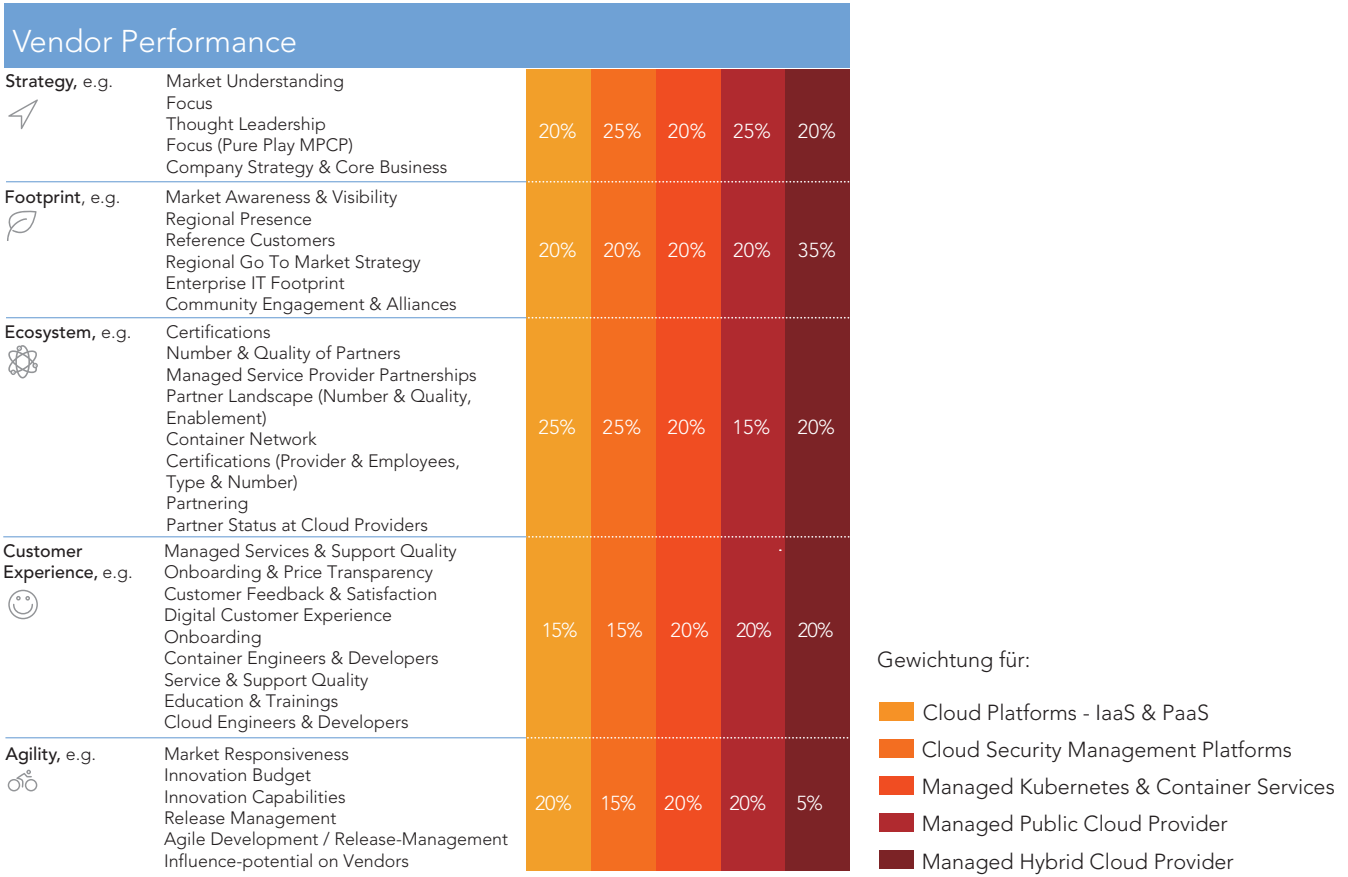
Strategy: Strategy and market understanding.

Footprint: Competitive strength and market presence in terms of customers, reach, visibility and go-to-market.

Ökosystem: Number and importance of partnerships with technology providers / service providers and participation in communities.

Customer Experience: Dealing with customers in terms of quality of advice and support, as well as employee skills.

Agility: Speed and innovation of vendors, evaluated by organizational structure, support for agile methods / DevOps concepts and market responsiveness (for example, how fast will new technology vendor services be delivered to customers?).



To ensure the comparability and precise evaluation of the offers and providers within their respective markets, the defined criteria are further refined depending on the market category. The characteristics and peculiarities of each market are therefore partially characteristic and potentially critical in terms of supplier selection. As a result, the Cloud Platforms, Cloud Security Management Platforms, Managed Container Services, Managed Public Cloud and Managed Hybrid Cloud Providers categories are evaluated using additional individual sub-criteria that are intended to map key decision-making characteristics. Furthermore, the individual criteria within the Product / Service Value Creation and Vendor Performance categories are weighted differently, in order to be able to factor in decision maker preferences and current market conditions.

DEFINITION OF VALUATION CATEGORIES AND WEIGHTINGS

In the platform area, it is currently important to provide a high-performance infrastructure, open interfaces and good platform services. These are characterized by quality and quantity, but also migration and hybrid capabilities. For this reason, the Product Portfolio, Product Experience and Integration sub-criteria are rated highest. In the current market phase, economic factors are no longer key issue. In terms of vendor performance, the Cloud providers' primary concern is that their ecosystem should be as extensive as possible and consist of well-trained partners. Thus, the dependencies of the ecosystem are more important for success than the strategy or innovation potential of the providers.

In the second technology segment of Cloud Security Management Platforms, the functionality of the solutions is also of paramount importance. The provision of various features for comprehensive architecture security is as important as broad support for hybrid architectures, Private Cloud technologies and Public Cloud platforms. This also includes close partnerships with the technology providers and solution partners as key determinants of vendor performance.

The emerging segment of Managed Kubernetes and Container Services is already defined by its own momentum thanks to the open source community. For the service providers who start with their own platforms and services, the platform offer itself (service portfolio) and service competence (service experience), together with the support of various Private, Public and Hybrid Cloud platforms, play the most important role. On the vendor performance side, the criteria are distributed equally. This is because partners and strategy are just as important as a regional presence, community engagement, constant innovation and development readiness.

Managed Public Cloud Providers are essentially entrusted with running Public Cloud applications and infrastructures. This is mostly about setting up a stable operation as quickly and effectively as possible. The capital is therefore to be found in the expertise and workflow that are reflected in the service portfolio and service experience. It is also important to keep developing and optimizing the platforms (for example through proven competences in the container environment). Managed Public Cloud Providers are also characterized by the fact that they act as thought leaders in the Cloud arena and also establish a strong presence for community usage.

Managed Hybrid Cloud Providers, on the other hand, have a significantly higher proportion of traditional IT and managed service competencies. Thus, knowledge and workflows are at least as important (service portfolio and experience) as they are in relation to Managed Public Cloud Providers. In addition, the integration topic with regard to their own data centers and the networking of many different platforms which are required for comprehensive coverage of corporate IT operations, is also key. Therefore, long-term experience and an established presence in the enterprise segment is crucial in relation to vendor performance here. Together with thought leadership in the Hybrid Cloud sector, the ecosystem, especially among technology partners, and training competence are the key criteria for most decision makers.

2

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ANALYSIS

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POSITIONING OF CLOUD COMPUTING VENDORS AND SERVICE PROVIDER

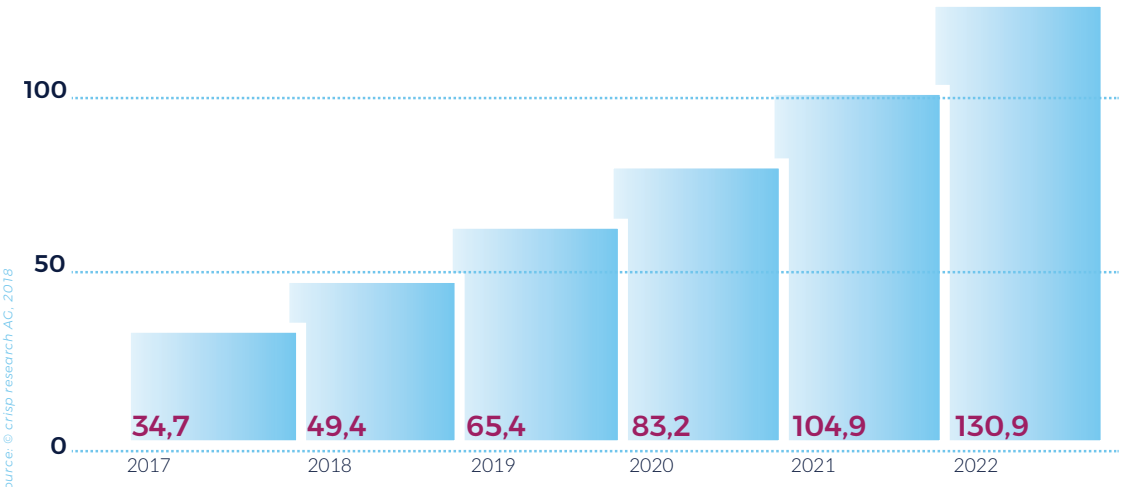
CLOUD PLATFORMS - IAAS & PAAS

The first thing people associate with Cloud Computing is often the Cloud platforms themselves. In a market that has become incredibly broad, diverse and pluralistic, there is still a lot of focus on the speed and development of these Public Cloud platforms. Moreover, they are still capable of causing profound change within corporate IT operations. This is one of the reasons why the discussion about Public Cloud platforms is still often controversial.

In fact, it really is true that these Cloud platforms are core to the Cloud market. While they cannot exist without the many complementary technologies and service offerings that surround them, they are still at the heart of any Cloud architecture. As a result, spending on Cloud Computing continues to grow rapidly. The drivers for this spending are now, above all, the expansion scenarios of companies that want to map real production scenarios onto the Public Cloud after initial PoCs re completed. According to forecasts by Crisp Research, around EUR 49.4 billion will be spent on Infrastructure-as-a-Service and Platform-as-a-Service in 2018. In 2019, that number will increase to EUR 65.4 billion.

After years of using the Cloud for numerous development and test workloads, and moving reluctantly towards running true business applications on the Cloud, the strategic importance of this alternative infrastructure has become all the more ubiquitous.

// Public IaaS Global Market Volume



Businesses have been actively using Public Cloud infrastructures as the operational foundation for business-critical workloads. This often involves many new digital "Cloud-native" applications, which are developed directly in the Cloud and require high agility and flexibility. In the areas of IoT and Artificial Intelligence / Machine Learning in particular, numerous providers have identified significant potential and offer additional services that make these workloads particularly easy to set up and operate.

However, in addition to the numerous microservices from providers, the trend towards openness is becoming increasingly apparent. Proprietary platform services are still in high demand, but will soon be threatened by open services. Standards, interfaces, protocols etc., increasingly come from the open source community, rather than from an IaaS or PaaS provider. A prominent example of comes in the form of containers and Kubernetes. Although Google has significant involvement in the development of Kubernetes as an IaaS provider, the project has now become "open source" thanks to the Cloud Native Computing Foundation. For their part, providers are being forced to actively integrate these open standards into their platforms and ensure smooth functionality. However, not all of them have been able to do this.

As they strive to become a provider of choice for organizations, Public Cloud infrastructure players are also extremely active in another areas. Many companies want to operate existing enterprise applications in the Cloud and actively migrate them. For these "Lift & Shift" scenarios, there are a few basic requirements in terms of management and operation that a pure Public Cloud infrastructure per se cannot usually guarantee. In particular, major providers have partnered with other IT heavyweights in order to minimize migration hurdles and make Hybrid Cloud operating models a little easier to implement. The most important of these partnerships are those with SAP, which continues to be one of the largest providers of enterprise software, as well as VMware as an essential provider of infrastructure management.

If Cloud infrastructure providers really want to offer a corporate-grade portfolio, they need to act as the operating platform for both new and existing workloads. Only niche players can get away with an "either-or" positioning. Nevertheless, there are still many basic qualities that characterize a good Cloud infrastructure provider. In practice therefore, the most important characteristics and decision criteria are:

- Solid, powerful IaaS (network, compute, storage)
- Distributed Storage Options (Hot & Cold)
- Usage-based pricing with low flat fee (also serverless computing)
- Relevant platform and microservices
- Hybrid Cloud / Lift & Shift offers (management, software partners)
- Open Platform / Open Source
- Support for container workloads (Kubernetes)

Providers must meet these criteria on a daily basis. Because, in spite of the overall market situation, in which only a few large players share the balance of power among themselves, there are actually many regional providers who can still play a relevant role in the market.

Out of 29 suppliers examined within the longlist in the course of this analysis, 21 were shortlisted for the Quadrant.

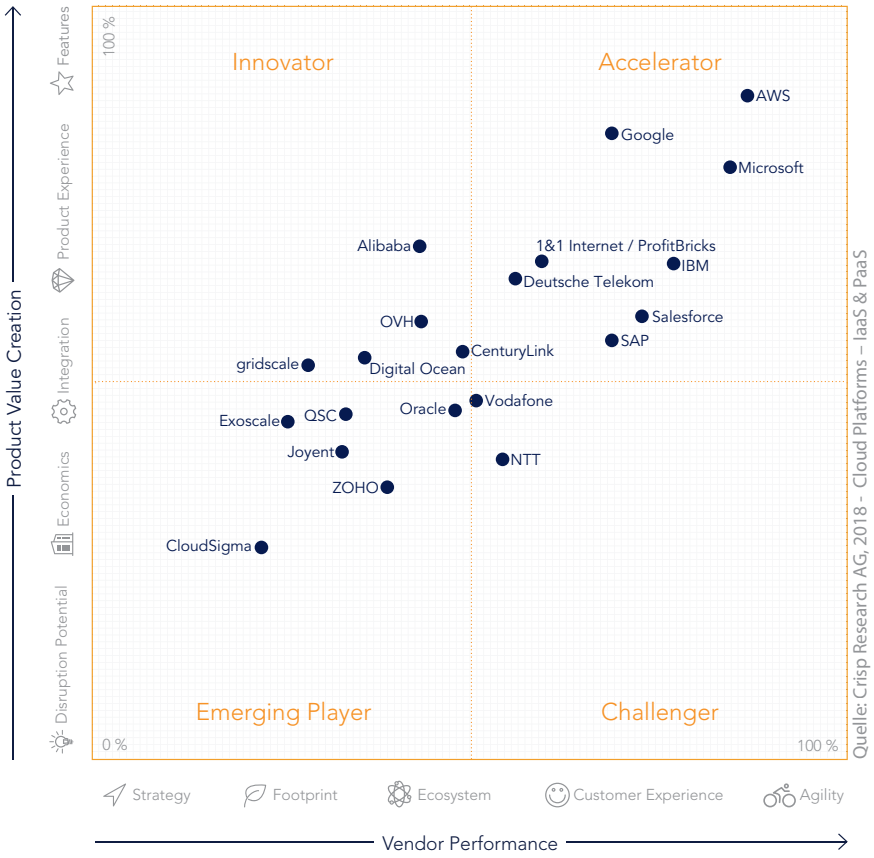
Among them, **Amazon Web Services** continues to be the market leader that makes a convincing case through the number and size of its customers and projects, as well as in terms of its portfolio. From this position, AWS continues to grow and innovate while responding to the market and the ever-changing needs of users. In combination with its own platform services, which are numerous as well as highly relevant, AWS currently has all the assets it needs to shape the market. Its excellent support capability and its recent partnership with VMware have increased its relevance for large corporations even further.

The **Google** Cloud Platform proves that even among Cloud infrastructure market leaders, the balance of power can shift

significantly. In the end, Google has emerged as one of the winners over the last few months, which is largely attributable to an excellent sense for new platform services and innovations, as well as enterprise strategy. With its own hardware and its own network, Google still stands for high performance, which is supported by numerous platform services, especially those in the area of Artificial Intelligence and IoT. But Google has also established itself as the leader in the Kubernetes market thanks to its early engagement. Its new enterprise strategy is not yet available to all companies, due in part to the small size of its current partner ecosystem. Therefore, Google must continue to pursue a larger footprint and increased credibility to take advantage of its current momentum.

Microsoft Azure is one of the top three players in the Cloud platform space but has much to fear from Google's position as No. 2. Microsoft is definitely one of the market leaders thanks to the strong foundation provided by its extensive footprint within organizations, its broad ecosystem and an extensive range of infrastructure and microservices. In practice however, the stability of the platform, especially when it comes to operating workloads outside of the Microsoft universe and with Kubernetes in particular, reveals gaps in comparison to its other two major competitors. Due to the high level of service integration and packaging, Azure contracts are often expensive. As a result, Microsoft must defend its status as one of the top 3 Public Cloud providers more strongly.

The Accelerators also include the **IBM** Cloud Platform. With a similar basic starting point to Microsoft, IBM can also access a large number of existing customers in order to form strategic partnerships for the often cited "Cloud Transformation" process. However, IBM's Cloud strategy runs somewhat contrary to those of other providers. Far less focused on delivering pure Public Cloud resources, IBM sees Cloud Computing as a holistic approach to private and public infrastructures, enterprise applications, and KI and Watson services. The special feature here is that the data on all the infrastructures involved belongs to the customer. This is how IBM specifically targets enterprise customers and is working towards delivering a full-service approach. This restricts its relevance as a pure-bred Public Cloud to a large audience, looking less at full enterprise operations and more at a good Cloud alternative.



ProfitBricks does also not quite rank alongside the major Cloud platforms, but it still plays an important role in the German market as one of the top 5 Cloud infrastructure providers. With its focus on IaaS operation from within Germany, ProfitBricks' infrastructures are a relevant alternative, especially when it comes to data protection. Also, its customers, which are predominantly midsized businesses, always have a local contact person. This makes ProfitBricks particularly suitable as a "starter Cloud", with a targeted selection of platform services, but also with a clear focus on pure IaaS.

Deutsche Telekom's Open Telekom Cloud is also positioned as an IaaS offering for German SMEs. With German data centers and a high level of data protection and compliance promises, Telekom and its partner Huawei have built up a competitive Cloud infrastructure. The Open Telekom Cloud is one of the many components of the provider's holistic enterprise offering. With numerous proprietary and external infrastructures (including the German Azure Cloud as a trustee), Telekom can rely on a particularly flexible IT infrastructure offering, rounded off by numerous add-ons such as managed services, partner applications and its own network.

The group of Accelerators is completed by **Salesforce** and **SAP**. Unlike the other providers in this category, Salesforce and SAP offer only Platform-as-a-Service (PaaS). Unlike IaaS offerings, PaaS platforms already include pre-packaged items such as operating systems and middleware managed by the vendor. This often makes it easier to run certain workloads on the PaaS, but limits flexibility. Users are therefore more likely to prefer IaaS provider offerings for their generic workloads. Salesforce's platform, known as Force.com, and the SAP Cloud are particularly strong in relation to their own environments. With the proliferation of Salesforce and SAP applications, they can provide the foundation for a large number and wide range of workloads. And, within the context of the Internet of Things, both providers have presented dedicated services based on their existing portfolios, which should expand the range of their platforms' capabilities. Salesforce and SAP therefore provide legitimate proprietary alternatives to the leading offerings in the Cloud platform environment.

The Innovators in the Cloud platform market are led by Chinese search engine giant **Alibaba**, which is increasingly on the radar of companies looking for a provider. A closer look reveals that Alibaba's architecture construction and portfolio appear to have been guided by market leader Amazon. Many services and the underlying user experience are very similar. Many service providers have also taken a closer look at Alibaba and investigated a potential partnership. Undoubtedly, Alibaba is also gaining ground in Europe. The bottom line, however, is that the platform is only a serious alternative if users conduct a large part of their business in Asia and therefore need on-site Cloud resources.

In Europe and Germany in particular, **OVH** is also taking the subject of Public Cloud more and more seriously. In combination with its hosting and Private Cloud portfolio, the Public Cloud sector has also become an important part of the provider's go-to-market strategy. VMware's former Cloud resources are characterized by high performance and security, and are based mainly on reserved instances in terms of the pricing model. Nevertheless, OVH still needs the X-factor in the corporate environment in order to differentiate itself from competitive offerings in such a way that the genuine demand gap can be closed.

US-based telecommunications provider **CenturyLink** is pushing more and more into Germany as one of its 60+ data centers worldwide is located in Frankfurt. In addition to its many outsourcing and managed services, CenturyLink also has its own Public Cloud platform. The offering includes classic IaaS as well as PaaS options, which offer high performance through the company's own network.

Digital Ocean continues to be an option for developers in the Public Cloud market. With its ready-made IaaS droplets, the platform places great value on high usability and fast deployment. Digital Ocean has not yet made the leap towards the enterprise market, especially in Germany, although its partnerships and projects are meaningful.

gridscale is a relatively young provider that has established itself as an Innovator in the Cloud platform market environment. The provider launched in October 2015 with the aim of making Cloud Computing even more intuitive and easier for customers in German-speaking countries. With a high level of data protection provided by its German data centers and numerous automation features, customers get a simple and secure Cloud infrastructure for their application operation. Together with the transparent billing model, the gridscale Cloud is also perfect for beginners. Likewise, some successful projects with service providers using the gridscale white label solution have already shown that the platform is a relevant alternative to the offerings of the market leaders.

The Challengers this year are Vodafone and NTT.

Vodafone's Cloud & Hosting division offers a choice of five different Cloud infrastructures, including two proprietary offerings within the Public Cloud IaaS model (Total Cloud Flex & Total Cloud Fusion). With its own network and high security standards, Vodafone offers a selection of Cloud services designed specifically to operate traditional enterprise workloads. With the Fusion option, there is also a flexible and "developer friendly" version based on micro-VMs. In combination with Private Cloud services and the Alibaba Cloud, which Vodafone operates exclusively, customers are enabled to build their own Cloud stack.

The **NTT Group**, which also includes NTT Data and Dimension Data, offers an extensive network of Public Cloud services. But the sweet spot of its IaaS division is mainly in Asia. In Germany, its infrastructures are used primarily as an add-on to the managed service and technology portfolios of its subsidiaries.

Oracle is rated among the Emerging Players this year. Despite its powerful market position as a provider of business software, its Cloud offer is only operational to a limited extent. Although the foundation has been laid with a new German data center, it is not a relevant IaaS option outside of its own solutions.

The Cologne-based telecommunications provider **QSC** also sticks to its own Cloud, which can be used primarily for small and medium-sized businesses or as the basis for its own IoT services. The focus, however, is increasingly on the service business.

Exoscale has introduced a very exciting Public Cloud platform that has been launched by A1 Telekom from Austria. It will be interesting to see if Exoscale will be able to win more exciting projects and have some impact on the big Cloud providers.

The **Joyent Triton** Cloud is particularly relevant as an open platform in the Kubernetes and container environment. It is not focused on making the leap to a broad IaaS platform.

The CRM and SaaS provider **ZOHO** also offers a PaaS platform in its portfolio, which is particularly suitable for the development and operation of SaaS applications.

CloudSigma completes the list of relevant IaaS providers. With nine Cloud locations and a headquarter in Switzerland, the provider offers a cheap entry-level alternative, but so far has not been able to increase the scope of its offering.

CLOUD SECURITY MANAGEMENT PLATFORMS

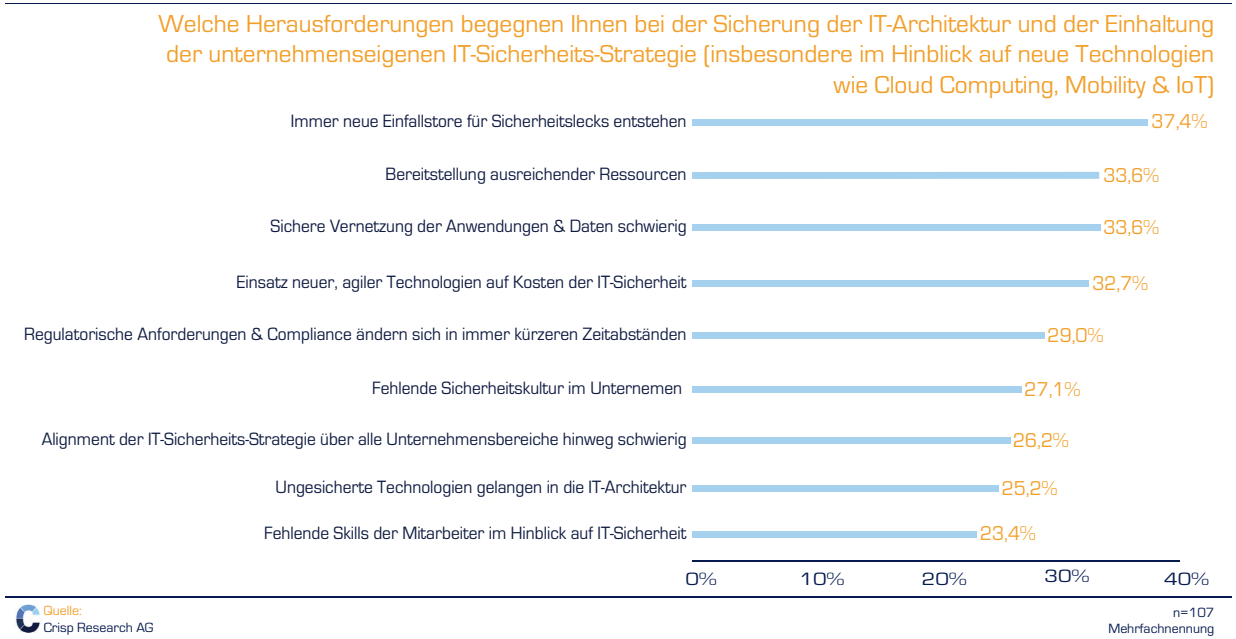
Cloud Computing has become more and more important within companies in recent years. Almost all new corporate IT architectures consist at least partially of Private or Public Cloud infrastructures. These infrastructures are increasingly critical to business operations and host important workloads whose data must be protected and whose operations must be fail-safe and secure against attacks. Like other applications, networks, and infrastructures, these next-generation IT and Cloud infrastructures must have at least one equivalent security platform to meet those needs. But decentralized and distributed infrastructures do not always make this easy, because simple security solutions without a Cloud interface may not function to their full potential. This is especially true if they need to work across multiple deployments and Public Cloud architectures.

Many decision-makers therefore see an IT security problem in these new technologies. Securing all the new infrastructure entry points is not always easy for many companies. As a result, Cloud initiatives are already moving into the production stages at the expense of security within some organizations.

At the same time however, many providers have already responded to the emergence of these security gaps. More and more of the major technology and security vendors offer dedicated services for Private, Public and Hybrid Cloud environments. These are usually an extended or modified form of the existing portfolio. After all, Cloud security management services generally use well-known tools such as firewalls, threat protection, data loss prevention, behavioral analytics, intrusion detection, encryption, disaster recovery, web, e-mail & network security or even identity & access services. The key change is in the delivery method or scope, as well as the combination of these solutions across the different infrastructures.

Many of the solutions also offer a higher level of automation in order to be able to apply central rules and protective measures across all platforms, while at the same time enabling management via a central interface.

In order to be able to guarantee this high level of security within the new Cloud architectures, the providers also had to adapt to the differing specifications of the various Cloud platforms. Open platforms are also much easier to use than proprietary solutions. Because of this, there are also minor differences between the products developed for e.g. OpenStack, VMware, Microsoft, AWS and Google within many of the security suites.



This has often changed the operating model of the solution itself, which can or must run either on-premise, on one of the Cloud architectures, or directly on each of the platforms to be protected. Many of the vendors have made this comparatively easy, enabling them to make their existing security solutions "Cloud-ready" with relatively small adjustments. But there are also some vendors who offer a dedicated (hybrid) Cloud security portfolio that includes common security standards, but which specifically address the securing of new Cloud architectures in terms of their combination and interfaces.

The focus of this analysis is not to compare "Security as a Service" products. The delivery method of the platforms is just one of many decision-making criteria for the mission critical operation of IT and Cloud infrastructures. Rather, the purpose here is to examine which solution offers the largest and most comprehensive level of security for the entire Cloud architecture. Within this context, the most important characteristics of leading Cloud Security Management Services are above all:

- Security-Features: The number and combination of security features is at once trivial and yet so important. How does the vendor manage to ensure the highest level of security for the architecture across one or more products, while ensuring a high level of flexibility and performance for the business? A basic set of security services is always needed for most solutions. Nevertheless, the features offered by many providers differ in their characteristics and composition.
- Platform diversity (Private, Public and Hybrid Cloud): The scope of operation is almost as important as the features themselves. Businesses have clearly indicated that a pure Public Cloud architecture does not have a future. Their environments are characterized by legacy systems, Private Clouds and several Public Cloud offerings. To provide real value, security services must be applicable to each platform, and management and policy management should be centralized.
- Automation: AI and Machine Learning are an increasingly important part of any relevant product. Within the field of security in particular, analytics-based services have long been a key issue. These services allow anomalies to be detected within the system and protective measures to be taken. Data can also be classified using machine learning algorithms, enabling it to be protected more effectively. However, infrastructure deployment and management are also becoming more and more automated. This also applies to security policy changes or, more importantly, to an extended scope as new Cloud infrastructures and workloads become operational.
- User Experience: Closely related to this is the user experience. On the one hand, this means that IT and admin teams can set up all their security services as simply as possible and handle management via a transparent, uniform console. Likewise, an effective user experience also means that users of the platforms should hardly notice the security services that are in place. Service characteristics should therefore include high performance, simple authentication (single sign-on) and no restrictions on functionality..

Many of these requirements are already met by the individual platform services of the Public Cloud platforms themselves. Nevertheless, an overarching service that can ensure a consistently high level of security across all components of a Hybrid or Multi-Cloud architecture is also required.

The Cloud Security Management Services market is already very large. This is mainly because numerous well-known providers of traditional security services operate in this space. But numerous IT giants, as well as specialist Cloud security players are also included. In some cases, the long-established companies have also strengthened their offerings through acquisitions that have helped them build a dedicated Cloud security offer. Most of the leading providers operate internationally. The focus on a regional market like Germany is no guarantee for a good solution, a fact that is particularly evident among the leading providers in this market.

Palo Alto Networks is currently the industry leader in Cloud Security Management Services. With various solutions for securing infrastructures, virtual machines and applications across Private and Public Clouds, Palo Alto has all the necessary security features in its portfolio. Close partnerships and

integrations with the leading Public Clouds of AWS, Google and Microsoft are an important requirement for achieving this functionality. With additional security and automation features, Palo Alto can cover a large part of the security needs of organizations themselves, enabling them to eliminate their customers' biggest vulnerabilities.

The same applies to **Barracuda**, which has created a Cloud solution based on its portfolio of content security, network and web application security, and disaster recovery. With the CloudGen Firewall, Barracuda has a distributed network optimization solution in its portfolio that can scale across deployments, providing protection across the entire Cloud and IT architecture.

Check Point is undoubtedly one of the top providers in the Cloud Security Management Services market. With its INIFITY Suite, Check Point offers a cyber security solution across the entire IT architecture (network, endpoints, Cloud). In addition, Check Point also offers Cloud Guard for Private and Public Clouds, which is essentially a threat protection solution for physical and virtualized infrastructure environments.

Cisco completes the leadership group in this market. With one of the broadest IT security portfolios, Cisco has had a head start in terms of playing an important role in the Cloud environment as well. Specific products, such as the Cloud Access Security Broker (CASB) CloudLock, complete the vendor's already extensive range of solutions that can be deployed on enterprise Hybrid Cloud architectures.

Trend Micro has secured a place among the Accelerators. The company's own Hybrid Cloud security platform, based on the new X-Gen series, provides comprehensive protection for Cloud architectures based on the established Trend Micro portfolio. Coupled with the key Trend Micro Deep Security server security solution, Hybrid Cloud Security has many features optimized for use on both virtual and Cloud infrastructures.

Symantec also has a solution called Hybrid Cloud Security in its portfolio. Similarly to Trend Micro, many existing services have been bundled together and deployed for virtual and Cloud infrastructures. Symantec Data Center Security also adds a product for hardening and continuous monitoring in VMware and OpenStack environments with container and physical server support. That's why Symantec, thanks to its many years of security expertise in the Cloud environment, scores highly in this market.

IBM's traditionally broad portfolio also extends into the Cloud security market. Numerous security services are included in its offering as a provider of Public Clouds and as part of its holistic approach. IBM blends security-as-a-service in terms of the operating model and Cloud Security Platforms. Nevertheless, there are a number of solutions that work to protect architectures across infrastructure boundaries and, in particular, leverage their value in terms of IBM's holistic approach.

McAfee has also been known for years as a major player within the security industry. It has strengthened its Cloud security platform with Skyhigh Networks. In addition to its traditional product range, there is also a clear focus on Cloud architectures. The core product is a Cloud Access Security Broker that covers many application scenarios optimized for AWS, Azure, and some SaaS applications.

Akamai is still known to many as a major CDN provider. But its security portfolio is also one of the most comprehensive in the enterprise environment. Akamai has used this suite of products as a foundation from which to extend its reach to Cloud architectures. The existing services were already very extensive and this is also reflected within the vendor's dedicated Cloud portfolio.

Forcepoint has moved parts of its TRITON family and Threat Protection Cloud services into a new Cloud product family. Operating within Forcepoint data centers, customers can secure much of their architecture with Web and Email Security and Threat Protection Services.

Microsoft has been working for some time to improve the image of its security offering, because its services are also very extensive and offer many features for securing Cloud architectures. Along with numerous Cloud-based security solutions for its own applications and devices, Microsoft has a broad reach and can rely on an enormous pool of data that enables automated security services and product enhancements.

However, its dependence on the rest of the Microsoft and Azure portfolios in particular is a negative factor compared to some other providers.

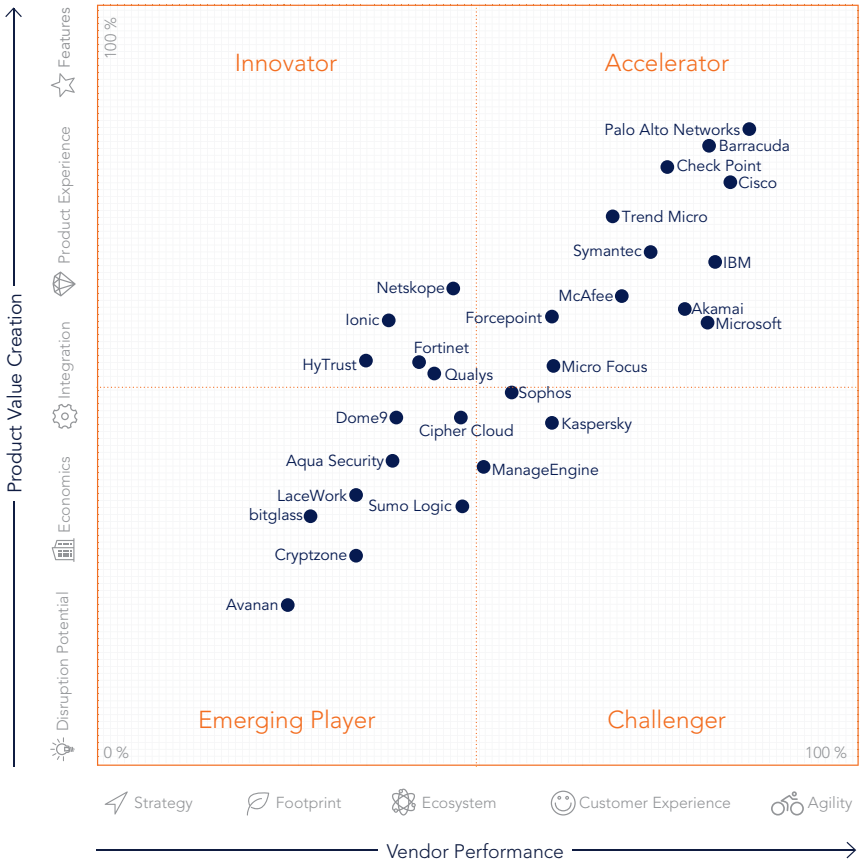
The remaining Accelerator in this market and competitive environment is Micro Focus. With a wide range of security and software, Micro Focus is characterized by its high level of flexibility. With its own IaaS platform for Cloud management and additional security services that can be assembled in a modular way, Micro Focus also has an attractive offer.

Among the Innovators, **Netskope** is one of the players that is still operating under the radar, but actually has a very attractive product range. With its Cloud XD suite, Netskope has put together an extensive and focused solution that provides a comprehensive set of elements to protect Cloud architectures through multiple features. It can be deployed flexibly as a pure Cloud service, on-premise solution or hybrid version. There are also other specific features offered for AWS, Azure and the Google Cloud, as well as numerous SaaS solutions.

IONIC Security has also focused strongly on securing Cloud infrastructures. Its products secure all data regardless of the infrastructure in use or "at rest". The platform has been on the market since 2016 and, after a few years of development, is now beginning to establish itself in the enterprise environment. However, it has not yet made a big impact in the German market.

Hy Trust's product family consists of four key solutions for securing Private, Public and Hybrid Couds. With an increased focus on VMware-based systems, Hy Trust has been able to build a suite consisting of CloudControl, DataControl, KeyControl, and CloudAdvisor, that can provide a high level of security, especially for hybrid architectures.

Fortinet offers a broad range of security solutions. Dedicated to Cloud architectures, Fortinet has a CASB and individual solutions for the leading Cloud platforms in its portfolio to protect applications and data in the Public Cloud as well. The provider operates primarily in the US, and its solutions are not well established within German organizations.



The remaining Innovator is **Qualys**, which has focused heavily on securing applications and data on Amazon, Google and Microsoft Public Cloud infrastructures. In addition, Qualys offers a solution for securing private infrastructures, enabling it to offer a pretty holistic stack of security and monitoring features for Hybrid Cloud architectures.

The Challengers segment is occupied by two security service provider, Sophos and Kaspersky, who are already very well known, especially in the consumer sector. They are joined by ManageEngine.

Sophos and **Kaspersky** have not yet properly oriented their businesses towards serving corporate customers, particularly in terms of product development.

While these vendors are often on the radar, they offer too little functionality in their solutions to really meet the Hybrid Cloud needs of large organizations.

ManageEngine also has a big footprint and is a well-known brand. Its IT and Cloud management solutions are very mature and are used extensively. However, its Cloud security portfolio, which with a few exceptions is limited to log management for the large Public Cloud platforms, is not sufficiently differentiated yet.

These providers are accompanied by numerous Emerging Players. All of these vendors, including **Cipher Cloud**, **Dome9**, **Aqua Security**, **LaceWork**, **Sumo Logic**, **bitglass**, **Cryptozone**, and **Avanan**, have become heavily involved in securing Public Cloud architectures. The Cloud Access Security Brokers and features, which in the case of Aqua Security also apply to container environments, are all very well within their scope, but are limited in their completeness. Therefore, for many companies with extensive Cloud architectures and Private Cloud deployments, they can be used as add-ons, but not as the central solution.

This analysis shows clearly once again that in this market, providers that can adjust to the needs of enterprise customers have a clear competitive advantage. Competence in the Cloud and Public Cloud environment are important criteria that contribute to purchasing decisions. However, the existing security portfolio, reach, support and functionality as a whole are the key design and decision criteria in the current market.

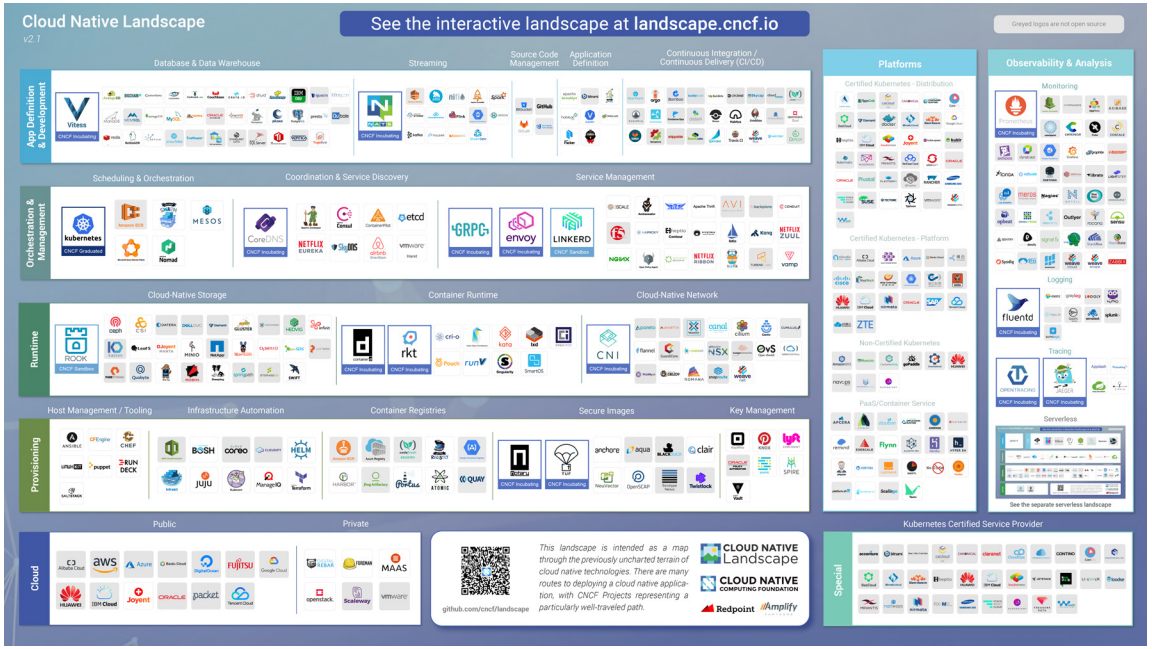
MANAGED KUBERNETES & CONTAINER SERVICES

There is no doubt that one of the key topics within Cloud Computing is currently that of container technologies and Kubernetes services. Within the context of their "digital journey", many companies are under pressure to create new products and IT solutions with agility and speed. These new requirements can no longer be met by traditional IT systems and development methods, which has led to the evolution of modern, container-based technologies such as Kubernetes. This has powered the development and operation of agile, microservices-based applications. The container trend started as a developer phenomenon, and first became popular in the form of Docker technology. A container combines a single application and all its dependencies such as libraries, utilities, and static data into an image file, but without a complete operating system. In this sense, containers can be compared to a lightweight form of virtualization. Within the microservice architecture, they can be operated across multiple systems independently of the operating system.

This developer phenomenon quickly became a much-hyped topic, and then, just as quickly became a true strategic business trend. Many companies and their IT departments, as well as service providers, have recognized the potential of containers and are already implementing their first projects. However, many of these projects also needed a management interface that can manage container clusters in the simplest, most agile way possible. This is where the Kubernetes platform, originally developed by Google under the name 'Borg', comes into its own. Moreover, it is now being supported as an open source project by the Cloud Native Computing Foundation. Kubernetes enables the deployment, operation, maintenance and scaling of container-based applications to be automated. Thanks to the open source nature of the project, numerous companies are now participating and contributing to its further development.

The goal of the Cloud Native Computing Foundation is to standardize the development of Cloud native technologies and services by creating a reference technology stack. Kubernetes, one of the flagship platforms of the CNCF, also has its own certification program. That's because despite the open source approach, companies still need extensive assistance with the construction and operation of container and Kubernetes architecture.

As a result, there are already quite a few service providers working with Kubernetes that can help companies with container orchestration. But it's not primarily about those providers that operate their own solutions with the help of Kubernetes and Co. and only indirectly help organizations.



Rather, it's about operating the container architectures on behalf of customers. Many vendors have also developed their own management solutions based on Kubernetes, which ensure automation and operation is possible across multiple Cloud and on-premise platforms.

At the moment, apart from the expertise around containers and the openness in terms of deployments, this is the main differentiation among providers. The important factor here is that service providers offer an end-to-end approach rather than only offering container services for their own infrastructure or Cloud platform. This is the case, for example, with Amazon Web Services, Microsoft and, with some restrictions, also with Google.

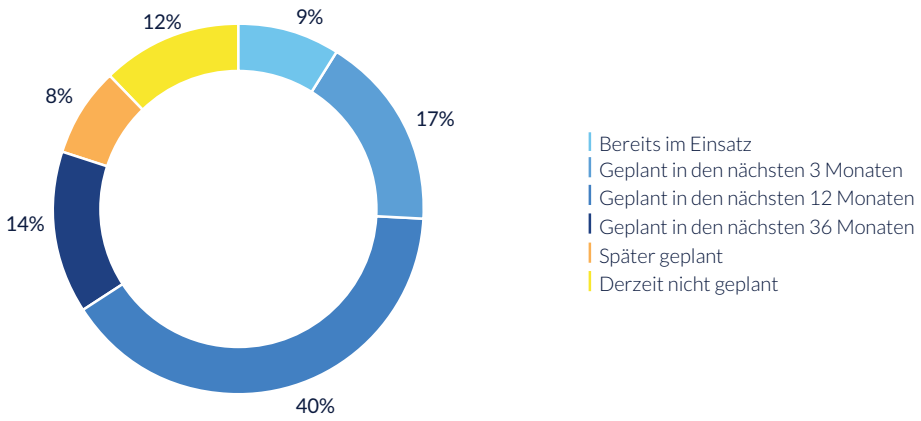
The service providers which have specialized in the open approach will play an important role within companies in both the short and medium term. They are also capable of adapting rapidly to a significant increase in demand. According to a recent study conducted by Crisp Research together with PlusServer, only nine percent of companies currently use Container Services, but 71 percent of the companies want to do so over the next 36 months, and start operating container clusters within their IT.

At present, the market for managed Kubernetes services is dominated by service providers that have focused heavily on container services. Those who are active with their own Kubernetes-based management platform have a particular advantage here. But some Managed Cloud providers, operating enterprise applications on Public and Hybrid Clouds, have also extended their portfolio with container platforms.

Despite the comparatively young market environment, there are already numerous Accelerators and relevant providers in play. This is partly because the Cloud Native Computing Foundation has access to technology and development capacity from many vendors and contributors. On the other hand, due to high demand and the numerous testing scenarios required, expertise in this area has developed quickly. The diverse requirements of businesses (pure play providers vs. open source vs. Managed Cloud providers) are reflected in the very different characteristics of the leading providers.

The leading provider of managed Kubernetes services is currently **GiantSwarm**. The team has shown strong growth since 2014 and, thanks to its community work and portfolio approach in Germany, it's the thought leader in container and Kubernetes. The flexibility it has to operate its container clusters on its own infrastructures or in the Microsoft and AWS public

// Bis wann wollen Sie Kubernetes bzw. ein Container-Management-Tool im Unternehmen einsetzen?



// Quelle: © crisp research AG, 2018

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Einfachnennung

clouds gives businesses additional freedom. This has already paid off in some significant reference projects, including one for adidas.

Red Hat is also among the top providers positioned within the container and Kubernetes environment. With a far less regional service approach and a sharp focus on its own OpenShift platform, Red Hat is helping to drive the increasing momentum of container technology in Germany. In any case, the technology and the CoreOS team, which belongs directly to Red Hat and its Kubernetes offering, also make an important contribution here.

Pivotal also offers a popular container platform with its own Kubernetes service based on Cloud Foundry. Pivotal's open stack provides many additional services that, together with the open platform approach, can map an entire IT stack. However, Pivotal also focuses more on technology than service.

This applies to **Platform9**, another US provider of container services, too. As a provider of Managed Hybrid Cloud and SaaS services, Platform9 has a strong connection to Container Services and offers a managed Kubernetes environment. Its extensive experience in the open source environment and a high level of technological expertise bring Platform9 a place among the Accelerators, despite little visibility within German companies.

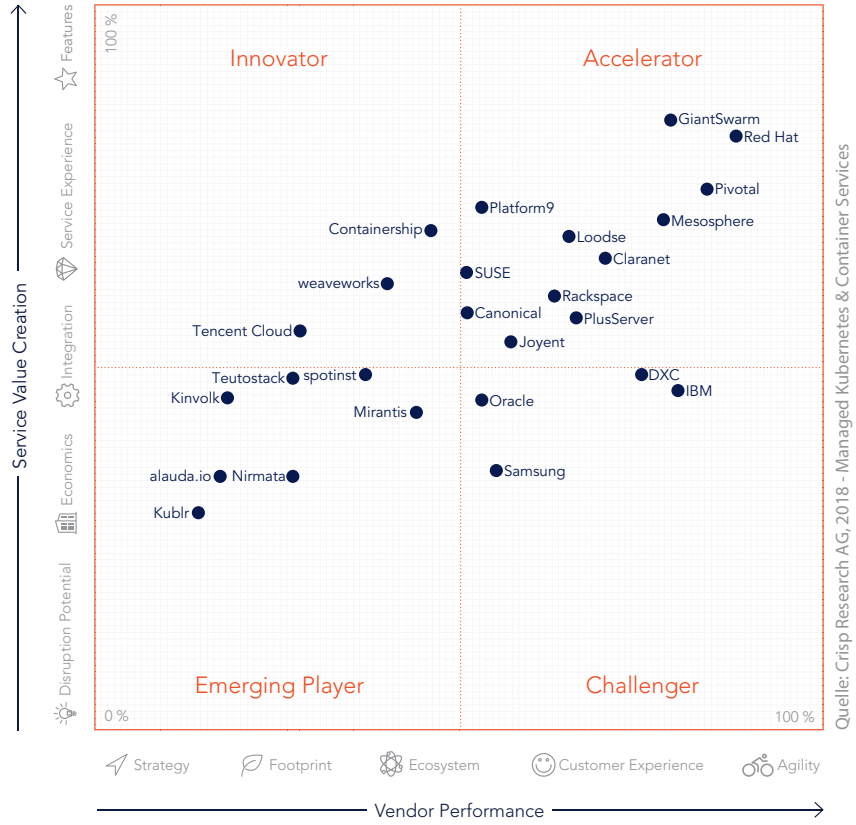
By contrast, **Mesosphere** is a well-known name within German businesses and even more so within the open source community. In fact, Mesosphere has managed to gain a lot of attention quickly thanks to its own operating system DC / OS. Riding the wave of container hype, Mesosphere also found its way into this new market segment at an early stage and now offers a corresponding service on its platform.

Loodse from Hamburg also has great potential to play an important role in the Kubernetes and container environment. The provider's Kubernmatic's platform left the beta stage in the past year and is now in operation at numerous high-profile customers. Another interesting aspect is this provider's partnership with several other vendors, such as SysEleven, which offers Loodse and the Kubermatic platform even more opportunities to further develop the solution and deliver it to businesses.

The first Managed Cloud provider among the Accelerators in this market environment is **Claranet**. With a clear focus on the operation of enterprise IT environments, the operation of container clusters is not an immediate priority. Nevertheless, Claranet is one of the largest contributors to Kubernetes and offers its customers a comprehensive container orchestration service.

The same applies to the two other Managed Cloud providers Rackspace and PlusServer.

Rackspace has an extensive service and portfolio catalog in the Managed Cloud environment. The US service provider, which has been operating its own infrastructures for many years, is



increasingly expanding its offering with open services. On this basis, container services based on Kubernetes should not be missing.

PlusServer, which has strengthened itself by acquiring the expertise of Nexinto, actively participates as a contributor in the Kubernetes environment, offering its own services in addition to Hybrid Cloud services for operating container clusters on Cloud or hosting environments.

Another grouping is made up of the large Linux experts SUSE and Canonical, which are also among the Accelerators in the area of managed Kubernetes services.

SUSE has recently become much more independent due to a change of ownership. But even before that, the German Linux pioneer had been able to establish a solid position for its own Kubernetes-based container platform and associated range of services.

Canonical, the company behind Ubuntu, also offers a managed Kubernetes service. Due to its many years of experience in the open source environment and a large team of experts, this platform-independent variant can be a solid option for many companies.

Finally, **Joyent** offers a Kubernetes service on its Triton foundation. Despite having its own Cloud platform, Joyent's Kubernetes offering is platform-independent, unlike the offerings from Cloud giants AWS, Microsoft and Google. With this solution, Joyent plays an important role in the orchestration of container clusters within organizations.

Containership just missed out on a spot as an Accelerator. This infrastructure and Cloud management startup provides its own Kubernetes engine management platform. The provider works particularly closely with Digital Ocean but numerous other Cloud and technology platforms are also supported. However, to be taken seriously in Germany it needs to establish a regional presence.

Weaveworks also provides a platform for the management of container clusters and microservices. In addition to its own enterprise support and training, weaveworks mainly operates its own integrated platform, particularly on the major AWS, Google and Azure Cloud platforms.

Asian supplier **Tencent Cloud** is taking its first steps towards Europe and is therefore the third Innovator in the market for managed Kubernetes and Container Services. Its own Kubernetes management platform is still relatively unknown in this country, but could also become an alternative to its competitors in the medium term through a strategic go-to-market initiative. The addition of a regional support team is also a prerequisite here.

There are four IT heavyweights within the market Challengers category for managed Kubernetes and Container Services. **DXC** and **IBM** are two of the largest IT service providers in the world, and they both offer Kubernetes and Container Services within their broad portfolios. However, the focus and differentiation of the offerings are not sufficient to rate either of them as leaders.

Oracle has also included managed Kubernetes services as part of its Cloud offensive. These can be used either on your own Cloud or on those of third-parties.

Samsung, or rather its SDS division, an early and active member of the CNCF, can also be considered a Challenger. However, its offering, which is predominantly global but open to all Public Clouds, is only a small operation within the enormous Samsung Group. There is a lot of scope for it to be expanded further and integrated into the company's regional operations.

The market is rounded off by another seven Emerging Players, none of which have yet been able to make the jump in terms of reach, go-to-market strategy and portfolio. Among them, **spotinst**, **Teutostack**, **Kinvolk, Nimata**, **alauda.io** and **Kublr** are exciting startups, some of which offer container cluster management with highly automated solutions. The seventh provider is **Mirantis**. This is a very well-known name, especially in the OpenStack environment. However, Mirantis has just begun to operate in this field and build a broader expertise. The shift towards markets and areas of operation that will be relevant for the long term is still pending.

Overall, the market for Managed Kubernetes and Container Services clearly demonstrates that even small providers have a good chance of playing an important role within large companies. By leveraging automation, they can make up for their lack of human resources and demonstrate their crucial role as service providers. With regard to "Containers and Kubernetes for the Enterprise" a lot of time must be invested in training, transformation and innovation. The expertise of many of the providers and the range of solutions that can be expanded upon via the open source movement are the best prerequisites for a genuine market to be created, and numerous case studies should be available before too long.

MANAGED PUBLIC CLOUD PROVIDER

Compared to managed Kubernetes and container service providers, Managed Cloud Providers are almost "old hands" in their business. Nevertheless, times are still changing very fast for them as well. Customer requirements, those of the Cloud providers and the competitive situation, are all driving them to maintain a high degree of dynamism and innovation.

Managed Public Cloud Providers are those who take over the operation of workloads based on Public Cloud platforms. They don't necessarily have their own infrastructures, because the relevant workloads are operated on the platforms of the Cloud Hyperscalers. The key qualities of these vendors include reducing the complexity of the Public Coud, keeping up with the release frequency of updates, and always staying up to date with the latest standards. Because most of the projects taken on by these Managed Public Cloud Providers are Cloud-native workloads that have already been developed in a Cloud environment, they have little legacy content and therefore need to be operated in a highly agile and flexible manner. Indeed, most of these are microservices architectures. However, in contrast to the Managed Kubernetes and Container Service Providers, Managed Public Cloud Providers take over the operation of entire applications and infrastructures, and are not solely responsible for container orchestration. At the same time, they are clearly differentiated from Managed Hybrid Cloud Providers, which use their own infrastructures to build a hybrid environment and usually run entire enterprise IT environments or large proportion of enterprise workloads. Naturally, Managed Public Cloud Providers must also integrate with existing systems or manage interfaces in these environments. Certainly, this is the exception rather than the rule. The core mission of these providers is to manage a limited number of applications or architectures in one or more Public Cloud environments.

For this reason, a much stronger distinction was made between Managed Public and Managed Hybrid Cloud Providers this year. In the past few years, many providers have, in practice, taken over both variants of infrastructure operation. Meanwhile, due to the increasing experience of the companies in terms of Cloud and the larger number of Cloud workloads, companies have begun to clearly distinguish between these types of providers during the sourcing process. For example, in relation to Cloud-native projects, they primarily look for providers who are familiar with Public Clouds, work with agile methods and can quickly find a solution. However, these providers are not suitable when existing and new infrastructures need to be merged, migrations beyond normal Lift and Shift scenarios are required, or when minor adjustments and an owned infrastructure or proven Private Cloud and on-premise competencies are required.

The market for Managed Cloud Providers is already very large and our long list featured almost 100 service providers in Germany that potentially position themselves as Managed Cloud Providers. This means that clear differentiation between providers is a must in this market. Because of the rapid development of the market in recent years, many suppliers are still in the process of entering it. In relation to system houses and system integrators in particular, when existing business dries up, "Cloud" is usually seen as the way out. There are also new market entrants who are trying to identify a niche or unmet need, and who want to shake up the market with a set of proprietary technologies or an innovative approach. So far, however, they still have a lot of work to do. The lead that the Cloud pioneers have established makes it very difficult for these new service providers to catch up.

As a result of all these factors, this year's shortlist of Managed Public Cloud Providers is significantly smaller than in previous years. This is because the peer group now consists of more focused service providers.

The field is led by the Finnish Managed Cloud Provider **Nordcloud**. Nordcloud has demonstrated particularly strong development in recent months and has been able to establish itself firmly in the German market. Its selection of vendors such as Amazon Web Services, Microsoft and Google, as well as numerous other technology partners, shows that it really understands the market, and can provide an excellent combination of services to its customers. The company's Managed Services, which are enhanced with proprietary tools for automated infrastructure management, are therefore of the highest quality.

The **Reply Group** was again able to confirm that it is one of the most important conglomerates for Managed Public Cloud Services. With its numerous subsidiaries, Reply has a particularly broad spectrum of experience in the field of Public Clouds. For example, Managed Services are offered to many of the leading providers that, despite the independent subsidiaries involved, are closely integrated with one another. The competence to provide services in the analytics environment and for traditional infrastructure services also helps with implementation within enterprises.

Claranet has also been able to significantly increase its presence and competence in recent months. The high proportion of its employees that are certified on the platforms of all the leading Cloud providers is already an important advantage. This is how Claranet is able to actively drive the German Google Cloud Community. The high level of competence in its existing business of operating high-performance and agile applications is another reason that Claranet is one of the most sought-after partners for Managed Public Cloud Services.

The **direct group** and in particular the brand IQ3. cloud have also established themselves among the leading service providers. Following the spin-off from the core direct group business, the IQ3.cloud has become an attractive platform for highly automated

Public Cloud operation. The high transparency of the service offering is an additional factor in making this provider a very individual but highly attractive partner for enterprises.

TecRacer from Hannover has also gone its own way. Its strategy remains clearly focused on Amazon Web Services, for which it is probably now the most competent and important partner in Germany. Its training programs and community engagement around AWS have really helped to put it on the map. TecRacer is still living up to its image, and its place among the Accelerator is safe.

CloudReach is an Accelerator too, but has achieved that status in a completely different way. With a much more global approach, resources and projects in Germany are not yet extensive. Nevertheless, CloudReach has found a good mix of partnerships with the leading cloud platforms and numerous successful technology partners. Together with its own solutions for automated infrastructure management or iPaaS, CloudReach has some good plans in place that should enable it to establish a stronger presence in Germany over the long term.

The unbelievable machine company (um *) has taken a significant step forward in its positioning since last year. With its core competence in machine learning and analytics, um* has demonstrated a high level of specific knowledge as a Cloud native company for many years. The expansion of its own Managed Cloud's offering now complements this well, even if it will not be the company's core business in the future. This is enabling the company's Basefarm subsidiary to align two different strategic business areas effectively.

Rackspace is also increasingly becoming an attractive partner for Managed Cloud Services. The expansion of its own resources and a sharpening of its Public Cloud infrastructure competencies clearly shows the direction in which this provider wants to develop its business. Although Rackspace is still carrying much of what used to be its core business, it has already proved it has an advanced level of Public Cloud competence in relation to AWS & Co.

The Mannheim-based service provider **Netlution** is also rated as an Accelerator in Managed Public Clouds. With a transparent process model, Netlution demonstrates a high level of competence in application operation on Multi-Cloud architectures. Operating internationally with numerous well-known clients, it has already completed projetcs the highest level, especially in relation to the 24/7 operation of critical applications.

The remaining accelerator, **Avanade**, is joining the group of leading providers for the first time this year. The Accenture-Microsoft joint venture is a strong partner, especially in the Azure and Office 365 environment. This also manifests itself in a broad overall competence profile, so that Avanade, despite its Microsoft focus, can also play an important role in the market.

In the Innovator group, **Zoi** is the successor of the former ITM. Zoi's team has focused on making Cloud services work for medium-sized businesses. With a comprehensive partner network including Google, AWS, Microsoft, Alibaba, and LeanIX, the company's preparation work has been exemplary. So far, however, it still lacks an extensive track record, especially for the new brand in the Cloud environment.

As an Innovator, **Root360** continues to focus on portal and eCommerce operations based on Amazon Web Services. The team from Leipzig has a strong name in its field of expertise and operates numerous well-known portals. In addition, Root360 continues to engage in the community, making it an attractive expert in its field.

Cloudwürdig has focused clearly on Google in terms of its Managed Public Cloud portfolio and has been a close Google Partner since 2009, offering a comprehensive portfolio of Google services. With Google Cloud gaining more traction in the enterprise market, the opportunity for it to become more relevant here has now arrived. However, the competition offered by other experienced MPCPs will be tough.

The Managed Public Cloud Provider shortlist includes no Challengers this year but does contain five Emerging Players. Because there are many small service providers in this market that are very well-versed in the Public Clouds, but have not been active in the market for a long time, there are relatively few providers

that have achieved a critical size and market awareness. Moreover, most of them do not yet have a sufficiently differentiated portfolio. Therefore, the remaining Emerging Players **Beck et al.**, **Cloudpilots**, **Retarus**, **kreuzwerker** and **InnoQ** are mostly smaller providers who have focused on a regional market, a specific target group or possess very specific niche skills, particularly in collaboration and communication. They are simply not in a position to compete with the market leaders.

MANAGED HYBRID CLOUD PROVIDER

As defined above, Managed Hybrid Cloud Providers are, in principle, very similar to the Managed Public Cloud Providers. They too define themselves to a large extent by using the platforms of the large Cloud Hyperscalers to take over the operation of applications and entire IT architectures. The main difference is that they also have their own infrastructures or actively incorporate the existing (Private Cloud) infrastructures of their customers into the architecture. In other words, the Managed Hybrid Cloud Providers have a much broader scope. It is typically these vendors who assume overall responsibility for infrastructure and Cloud within large enterprises. Large-scale migration projects move existing workloads to Cloud environments while retaining comprehensive management of the entire IT landscape. This is possible mainly due to the fact that the majority of Managed Hybrid Cloud Providers have been active in the outsourcing business for a long time and, in some cases, have been responsible for the IT operations of their customers for many years.

For this reason, the Managed Hybrid Cloud Services market differs significantly from Managed Public Cloud Services. Only two service providers, which were also analyzed and rated as Managed Public Cloud Providers, find themselves listed in the Hybrid Cloud market environment this year. Nevertheless, the number of market participants here is much larger than in its sister market. This is mainly because the big Cloud transformation wave within channel and/or the systems houses and SIs is evident here. With a few exceptions, all these service providers have their roots in the outsourcing or systems integration business. For some providers, a good opportunity existed to expand into the Cloud arena and move together with their customers towards new style of IT infrastructure at an early stage. But for many, the Cloud was also a threat to their existing businesses. Many traditional service providers and integrators felt the proverbial noose tightening around them, so that the move to the Cloud was really about survival, not just strategy.

This reality is evidenced by the fact that there are still a number of providers who only offer Cloud on paper and have no serious projects and clients to speak of. This is often not even due to the lack of demand within their customer base, but rather due to their inability to emerge from their comfort zone and plan seriously for a future which demands that the fast and targeted building of Cloud skills becomes a top priority.

However, this is no longer the case for service providers who qualified as Managed Hybrid Cloud Services providers within this analysis. This year, Accenture leads the market. With its global network of Cloud experts, who have been recruited from different units of the company, Accenture can demonstrate extensive Cloud expertise at the enterprise level. Due to the numerous acquisitions made in the last few years, a lot of expertise has entered the company, which has paid off in numerous projects with existing and new customers.

At **T-Systems**, the strategic approach to Cloud has changed somewhat. Increasingly, the entire group is aiming for a holistic Cloud strategy, and its own infrastructure and Cloud offerings play a key role here. Yet, external infrastructures, such as the recently added AWS, are also at the heart of the portfolio. This move was a market necessity for T-Systems. The combination of Cloud know-how with the numerous possibilities offered by the broad Telekom / T-Systems portfolio now gives organizations the largest possible choice of infrastructure options.

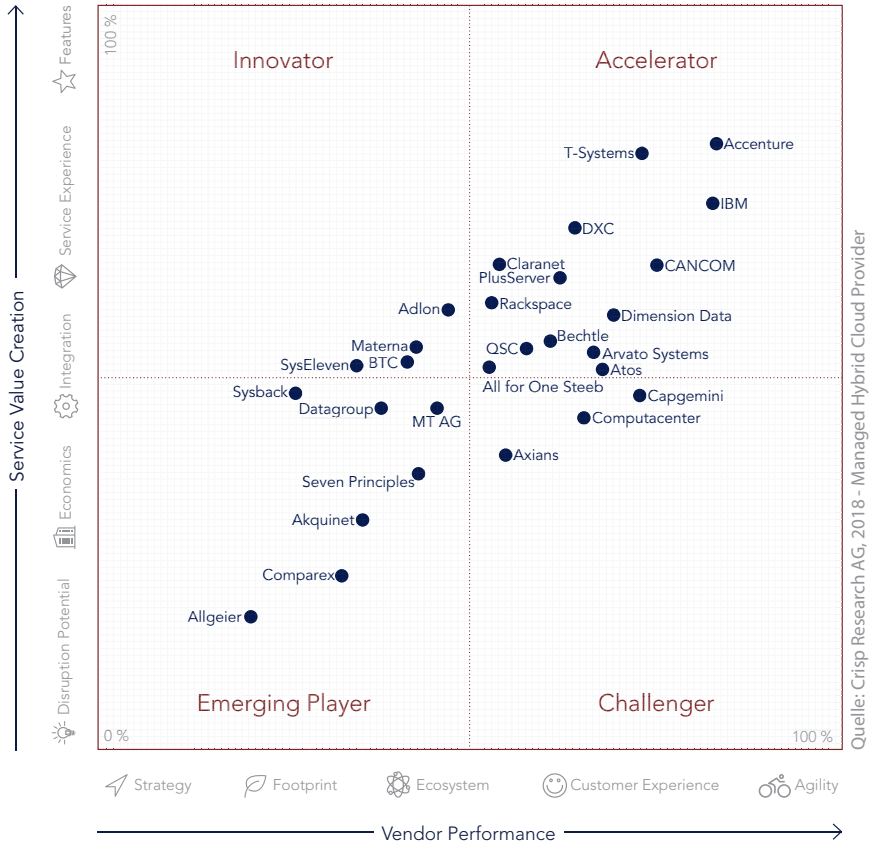
IBM is also driving a holistic Cloud approach. The Global Business Services consulting division is now working even more closely with its technology colleagues. This is both a curse and a blessing for customers. The expertise and the Hybrid Cloud competence of IBM in particular are undisputed. However, the

company's strategy is increasingly geared towards its own infrastructure stack. Although the other Public Cloud platforms and third-party infrastructures are covered, the holistic IBM path will become the standard offering.

DXC, which has emerged from the integration of CSC and the services division of HPE is slowly eliminating the ghosts of its past. Following its initial market entry, DXC has become a serious competitor and can play to its strengths on a regional basis. Thanks to close partnerships with the leading Public Cloud providers, as well as existing competences in traditional IT operations, it is now among the elite within the Managed Hybrid Cloud Providers segment.

CANCOM has already established itself as one of the leading Managed Hybrid Cloud Providers in the market. The combination of its own service expertise with an infrastructure offering for the business Cloud, which was added to the portfolio through the acquisition of Pironet NDH, is ideal for many medium-sized and large companies. Its own infrastructures and Private Clouds, which feature many self-service and customization options, can be connected to the infrastructures of the leading Public Cloud providers.

Claranet is one of the providers that is already well positioned the Managed Public Cloud Services market, but which can also compete well in the Hybrid Cloud arena. Despite its high level of investment in Public Cloud expertise, Claranet has not lost sight of its existing architectures. With long track record in offering its own infrastructures, Claranet is therefore well-equipped to operate extensive enterprise architectures in the Hybrid Cloud world.



Through the recent acquisition of Nexinto, **PlusServer** has joined the Managed Hybrid Cloud elite. The additional Cloud know-how is an important element in supporting its strategic direction. With its current Managed Hosting portfolio, as well as Managed Cloud Services based on AWS and Microsoft currently and Google in the future, as well as OpenStack and VMware-based infrastructures, PlusServer has chosen a good combination of platforms and already has numerous certifications to prove its expertise.

Rackspace is the second service provider that has already been rated in the Managed Public Cloud Provider environment. Rackspace's portfolio is likely to be even more focused on Hybrid rather than Public Cloud Services, especially in public. By closely interlinking its own infrastructures with third-party Cloud infrastructures, Rackspace has clearly prioritized the Hybrid Cloud approach. The expansion of the German team is particularly important in this regard. If Rackspace can continue to expand its resources, it will become a serious option for many companies.

NTT subsidiary **Dimension Data** has once again been able to qualify as an Accelerator for Hybrid Cloud Services this year. Its focus is on a holistic approach with its own infrastructures for Private and Public Clouds, which are combined with Managed Services on the large Public Cloud platforms. Despite its sharp focus

on infrastructure, Dimension Data is clearly positioning itself as a holistic digitization partner and is looking to provide a solution-oriented path for its customers.

The system house **Bechtle** has bundled its Cloud activities within its own business unit (Bechtle Clouds). This was a sensible step and shows that Bechtle is pursuing a clear goal despite its late market entry. The Microsoft platform is currently the main focus of its partnerships. This should be expanded further to enable Bechtle to become a one-stop-Cloud-shop for midsized companies.

Arvato Systems also began its Cloud efforts late, but has pursued them consistently. In the meantime, Arvato has joined the Hybrid Cloud elite in Germany and is demonstrating that traditional IT skills and innovative Cloud services do belong together. Its strategy, which is currently being implemented, follows a clear plan. In particular, the expansion of partnerships with leading Public Cloud providers is a high priority. As a result, and in combination with numerous proprietary technologies and tools, Arvato will soon be able to provide its customers with extensive Hybrid Cloud services.

The Cologne-based telecommunications service provider **QSC** is continuing to consistently implement its transformation towards becoming a Multi-Cloud Service Provider. Overall, QSC is positioning itself as a holistic digitization partner for SMEs. Leveraging its own Cloud solutions and its expertise with hyperscalers and traditional IT outsourcing, QSC has a clear strategy here, which has already paid off across numerous projects.

Thanks to its extensive expertise in the SAP and Microsoft environments, **All for One Steeb** is once again included within the Accelerators in Managed Hybrid Clouds this year. All for One's focus on SAP-related workloads and its years of experience in the field are particularly important in helping it attract customers. Building on this, its projects increasingly support customers with their entire Cloud strategies.

The remaining Accelerator in this market is **Atos**. Its clear Hybrid Cloud strategy continues to be the main growth driver for this outsourcing giant, and Atos is also perfectly prepared to be up front about the reality of its competencies. Nevertheless, its numerous experts in big Cloud and its own Private Cloud offerings are proof enough that Atos remains a provider to be reckoned with.

The Innovators hovering around the leading players all focus on providing a consistent Hybrid Cloud approach. As a holistic digitalization consultancy, **ADLON** combines a solution-oriented approach with the core competencies of a Hybrid Cloud provider. With its own data centers and numerous Cloud partnerships, as well as a high level of consulting expertise, ADLON also provides medium-sized customers with everything they need from an end-to-end service provider in the Cloud era.

The Cloud business is becoming more and more important at **Materna**. Its Managed Service for the operation of entire IT environments based on customers' own infrastructures, Materna's Private Clouds or the Public Clouds of the Hyperscalers, is based on a coherent concept. Over time, Materna will also be taken seriously as a true Cloud provider.

The north German service provider **BTC** is also focusing on Cloud as its core business in the future. After its first forays into the market over the last year, the business is now a small but stable part of the overall operation. Combined with a large existing business in traditional IT operations, its Cloud expertise is currently more of an add-on for existing customers.

SysEleven, on the other hand, has anchored the Cloud topic much more firmly within its strategy. Thanks to its own OpenStack-based platform and Managed Services, the provider can offer an attractive Managed Service package. It is also keen to get started early with new topics such as Kubernetes and Co. Whether its own Cloud platform will turn out to be successful remains to be seen, but its innovative approach indicates that it has a fighting chance.

Three service providers were rated as Challengers this year, all of which are characterized by an extensive strategy, a high profile in the enterprise environment, and a portfolio that is not yet fully aligned with market conditions and the competitive situation.

Among them is **Capgemini**, one of the world's largest consultancy businesses. The Cloud transformation it is planning is particularly promising. Moreover, behind its consulting facade, there is also an extensive migration and managed services portfolio. Access to the leading Cloud providers also gives it significant potential to evolve its offering here.

Cloud Computing often gets a little bit lost within **Computacenter**'s extensive portfolio. Cloud competence can be demonstrated across the company and the infrastructural foundation for all Computacenter's projects has a Hybrid Cloud character. But the differentiation of its dedicated Cloud competence could go even further. Its Data Center Services offering reflects its own infrastructure competence, which it combines with the offerings of the Public Cloud Hyperscalers.

The Cloud is also part of the big picture at **Axians**, the IT subsidiary of the French conglomerate Vinci Energies. However, despite its own Managed Cloud platform and numerous methodologies, the sweet spot for Axians seems to be in the traditional outsourcing business. Its broad competence is an important plus point, but it is also lacking in specific Cloud competencies within this dynamic competitive environment.

The Managed Hybrid Cloud Providers category is completed by seven additional Emerging Players. Datagroup is one of the big names here. For many of the service providers, however, the journey towards Cloud excellence and true Hybrid Cloud operations has only just begun and a differentiated portfolio, credibility and track record are all missing. In addition, there are some service providers who do not yet have a big name in the Hybrid Cloud environment on a supra-regional level. Nevertheless, service providers such as **Sysback**, **MT AG**, **Seven Principles**, **Akquinet**, **Comparex** and **Allgeier** all have expertise in these areas. At the very least, they all have an opportunity to develop beyond their respective niches into real competitors over the long term.

VENDOR ANALYSIS | Cloud Platforms - IaaS & PaaS

	Gewichtung	1&1 Internet / ProfitBricks	Alibaba	AWS	CenturyLink	CloudSigma	Digital Ocean	Exoscale	Google	gridscale	IBM	Joyent	Microsoft	NTT	Oracle	OVH	QSC	Salesforce	SAP	Telekom	Vodafone	ZOHO	Durchschnitt
Product Value Creation		66 %	68 %	88 %	54 %	28 %	54 %	45 %	83 %	53 %	66 %	41 %	79 %	40 %	47 %	58 %	46 %	59 %	56 %	64 %	48 %	36 %	
Product Portfolio	25 %	65 %	80 %	95 %	65 %	25 %	60 %	45 %	85 %	45 %	70 %	50 %	80 %	45 %	55 %	60 %	40 %	65 %	65 %	65 %	45 %	35 %	59 %
Product Experience	25 %	65 %	60 %	90 %	55 %	25 %	50 %	45 %	85 %	60 %	70 %	35 %	70 %	35 %	45 %	60 %	45 %	60 %	60 %	60 %	50 %	30 %	55 %
Integration & Security	20 %	60 %	65 %	90 %	65 %	30 %	55 %	45 %	80 %	45 %	80 %	50 %	90 %	40 %	55 %	70 %	60 %	60 %	55 %	70 %	45 %	40 %	60 %
Economics	15 %	85 %	65 %	80 %	40 %	35 %	50 %	60 %	75 %	65 %	45 %	35 %	75 %	40 %	40 %	45 %	45 %	55 %	40 %	80 %	55 %	45 %	54 %
Disruption Potential	15%	60 %	70 %	80 %	35 %	30 %	50 %	30 %	90 %	50 %	55 %	30 %	80 %	40 %	30 %	50 %	40 %	50 %	50 %	45 %	45 %	35 %	49 %
Vendor Performance		60 %	43 %	87 %	49 %	22 %	36 %	26 %	69 %	29 %	77 %	33 %	85 %	54 %	48 %	44 %	34 %	73 %	69 %	56 %	51 %	39 %	
Strategy	20 %	60 %	55 %	90 %	35 %	25 %	35 %	45 %	80 %	25 %	85 %	30 %	85 %	65 %	40 %	50 %	30 %	75 %	70 %	65 %	50 %	40 %	54 %
Footprint	20 %	70 %	30 %	85 %	35 %	15 %	40 %	15 %	60 %	20 %	85 %	25 %	90 %	50 %	60 %	40 %	35 %	75 %	80 %	65 %	45 %	30 %	49 %
Ecosystem	25 %	50 %	45 %	85 %	55 %	15 %	30 %	20 %	65 %	25 %	85 %	30 %	90 %	55 %	60 %	40 %	30 %	80 %	80 %	40 %	50 %	40 %	51 %
Customer Experience	15 %	60 %	40 %	90 %	55 %	30 %	30 %	25 %	70 %	35 %	65 %	30 %	80 %	50 %	40 %	50 %	40 %	65 %	45 %	60 %	55 %	40 %	50 %
Agility	20 %	60 %	45 %	85 %	65 %	30 %	45 %	25 %	70 %	40 %	60 %	50 %	75 %	50 %	35 %	40 %	35 %	65 %	60 %	55 %	55 %	45 %	52 %

VENDOR ANALYSIS | Cloud Security Management Platforms

	Gewichtung	Akamai	Aqua Security	Avanan	Barracuda	bitglass	Check Point	Cipher Cloud	Cisco	Cryptzone	Dome9	Forcepoint	Fortinet	HyTrust	IBM	Ionic	Kaspersky	LaceWork	ManageEngine	Durchschnitt
Product Value Creation		40 %	60 %	21 %	82 %	33 %	79 %	46 %	77 %	28 %	46 %	59 %	53 %	54 %	67 %	59 %	45 %	36 %	40 %	
Product Portfolio	25 %	45 %	75 %	25 %	85 %	40 %	80 %	55 %	85 %	35 %	65 %	70 %	70 %	65 %	70 %	75%	55 %	45 %	50 %	64 %
Product Experience	25 %	40 %	60 %	20 %	80 %	30 %	80 %	45 %	75 %	20 %	45 %	65 %	55 %	55 %	70 %	60 %	50 %	30 %	40 %	54 %
Integration	20 %	40 %	55 %	20 %	85 %	30 %	80 %	50 %	75 %	30 %	40 %	50 %	50 %	50 %	60 %	55 %	45 %	35 %	40%	53 %
Economics	10 %	40 %	55 %	20 %	75 %	25 %	80 %	40 %	70 %	30 %	35 %	55 %	40 %	55 %	65 %	60 %	30 %	30 %	30 %	49 %
Disruption Potential	20 %	35 %	50 %	20 %	80 %	35 %	75 %	35 %	75 %	25 %	35 %	50 %	40 %	40 %	65 %	40 %	35 %	35 %	30 %	47 %
Vendor Performance		39 %	77 %	25 %	81 %	28 %	75 %	48 %	83 %	34 %	39 %	60 %	42 %	35 %	81 %	38 %	60 %	34 %	51 %	
Strategy	25 %	35 %	80 %	30 %	80 %	30 %	80 %	45 %	80 %	35 %	40 %	70 %	55 %	35 %	80 %	35 %	55 %	30 %	55 %	57 %
Footprint	20 %	35 %	80 %	25 %	80 %	30 %	75 %	45 %	90 %	45 %	35 %	55 %	30 %	35 %	85 %	40 %	65 %	40 %	55 %	57 %
Ecosystem	25 %	50 %	75 %	20 %	85 %	25 %	70 %	50 %	85 %	35 %	50 %	65 %	45 %	30 %	90 %	35 %	60 %	35 %	50 %	57 %
Customer Experience	15 %	40 %	75 %	30 %	80 %	30 %	75 %	50 %	80 %	25 %	35 %	55 %	30 %	45 %	80 %	50 %	65 %	35 %	45 %	55 %
Agility	15 %	30 %	75 %	20 %	75 %	25 %	75 %	50 %	80 %	25 %	30 %	45 %	45 %	35 %	65 %	35 %	55 %	30 %	45 %	50 %

VENDOR ANALYSIS | Cloud Security Management Platforms

	Gewichtung	McAfee	Micro Focus	Microsoft	Netskope	Palo Alto Networks	Qualys	Sophos	Sumo Logic	Symantec	Trend Micro	Durchschnitt
Product Value Creation		62 %	53 %	59 %	63 %	84 %	52 %	49 %	34 %	68 %	73 %	
Product Portfolio	25 %	75 %	65 %	70 %	75 %	90 %	65 %	65 %	45 %	75 %	80 %	64 %
Product Experience	25 %	65 %	50 %	50 %	65 %	80 %	50 %	40 %	30 %	70 %	80 %	54 %
Integration	20 %	65 %	60 %	55 %	60 %	80 %	45 %	60 %	35 %	60 %	65 %	53 %
Economics	10 %	50 %	40 %	55 %	50 %	85 %	50 %	40 %	25 %	65 %	65 %	49 %
Disruption Potential	20 %	45 %	40 %	60 %	55 %	85 %	45 %	35 %	30 %	65 %	65 %	47 %
Vendor Performance		69 %	60 %	80 %	47 %	86 %	44 %	55 %	48 %	73 %	68 %	
Strategy	25 %	65 %	65 %	75 %	50 %	90 %	40 %	65 %	55 %	75 %	75 %	57 %
Footprint	20 %	65 %	60 %	90 %	50 %	80 %	45 %	60 %	50 %	75 %	70 %	57 %
Ecosystem	25 %	75 %	55 %	90 %	55 %	90 %	50 %	45 %	40 %	75 %	65 %	57 %
Customer Experience	15 %	75 %	60 %	75 %	40 %	80 %	45 %	55 %	45 %	75 %	65 %	55 %
Agility	15 %	65 %	60 %	65 %	30 %	85 %	40 %	45 %	50 %	60 %	60 %	50 %

VENDOR ANALYSIS | Managed Kubernetes & Container Services

	Gewichtung	alauda.io	Canonical	Claranet	Containership	DXC	GiantSwarm	IBM	Joyent Triton	Kinvolk	Kublr	Loodse	Mesosphere	Mirantis	Nirmata	Oracle	Pivotal	Platform9	PlusServer	Rackspace	Red Hat	Samsung	spotinst	SUSE	Tencent Cloud	Teutostack	weaveworks	Durchschnitt
Service Value Creation		35 %	58 %	65 %	69 %	49 %	84 %	47 %	54 %	46 %	30 %	68 %	70 %	44 %	35 %	46 %	75 %	72 %	57 %	60 %	82 %	36 %	49 %	63 %	55 %	49 %	62 %	
Service Portfolio	25 %	30%	55 %	65 %	70 %	45 %	95 %	35 %	55 %	45 %	25 %	70 %	65 %	35 %	35 %	35 %	80 %	70 %	65 %	65 %	85 %	40 %	45 %	75 %	55 %	60 %	75 %	57 %
Service Experience	25 %	35 %	70 %	75 %	65 %	50 %	75 %	50 %	55 %	35 %	30 %	70 %	80 %	45 %	30 %	55 %	70 %	70 %	55 %	70 %	80 %	45 %	50 %	65 %	60 %	55 %	65 %	58 %
Integration & Security	25 %	40 %	65 %	80 %	75 %	65 %	85 %	65 %	55 %	50 %	40 %	65 %	80 %	45 %	35 %	55 %	75 %	75 %	75 %	70 %	85 %	25 %	65 %	70 %	55 %	40 %	55 %	61 %
Economics	10 %	35 %	40 %	40 %	65 %	45 %	90 %	40 %	55 %	50 %	25 %	70 %	65 %	50 %	40 %	40 %	70 %	70 %	35 %	40 %	80 %	30 %	45 %	45 %	50 %	45 %	45 %	50 %
Disruption Potential	15%	35 %	40 %	40 %	65 %	30 %	75 %	35 %	45 %	55 %	25 %	65 %	50 %	50 %	40 %	35 %	75 %	75 %	30%	30 %	75 %	35 %	30 %	40 %	50 %	35 %	55 %	47 %
Vendor Performance		17 %	51 %	70 %	46 %	75 %	79 %	80 %	57 %	18 %	14 %	65 %	78 %	44 %	27 %	53 %	84 %	53 %	66 %	63 %	88 %	55 %	37 %	51 %	28 %	27 %	40 %	
Strategy	20 %	15 %	40 %	75 %	50 %	85 %	85 %	85 %	65 %	25 %	15 %	75 %	75 %	65 %	25 %	50 %	70 %	60 %	65 %	55 %	90 %	55 %	35 %	40 %	35 %	30 %	50 %	54 %
Footprint	20 %	20 %	50 %	70 %	35 %	75 %	85 %	75 %	55 %	15 %	10 %	60 %	75 %	55 %	30 %	40 %	80 %	50 %	60 %	60 %	85 %	40 %	50 %	35 %	20 %	25 %	35 %	50 %
Ecosystem	20 %	15 %	50 %	70 %	50 %	80 %	75 %	80 %	45 %	15 %	10 %	60 %	75 %	35 %	30%	55 %	90 %	50 %	70 %	65 %	90 %	60 %	40 %	35 %	35 %	30 %	40 %	52 %
Customer Experience	20 %	20 %	65 %	80 %	45 %	80 %	70 %	85 %	60 %	20 %	15 %	65 %	80 %	35 %	25 %	65 %	90 %	55 %	80 %	80 %	90 %	55 %	35 %	75 %	25 %	25 %	40 %	56 %
Agility	20 %	15 %	50 %	55 %	50 %	55 %	80 %	75 %	60 %	15 %	20 %	65 %	85 %	30 %	25 %	55 %	90 %	50 %	55 %	55 %	85 %	65 %	25 %	70 %	25 %	25 %	35 %	51 %

VENDOR ANALYSIS | Managed Public Cloud Provider

	Gewichtung	Avanade	Beck et al.	Claranet	Cloudpilots	CloudReach	Cloudwürdig	direkt gruppe (IQ3 CLOUD)	innoQ	kreuzwerker	Netlution	Nordcloud	Rackspace	Reply	Retarus	Root360	tecRacer	*um	Zoi	Durchschnitt
Product Value Creation		58 %	44 %	79 %	42 %	73 %	54 %	77 %	22 %	30 %	59 %	85 %	70 %	83 %	38 %	60 %	76 %	72 %	66 %	
Product Portfolio	25 %	65 %	35 %	80 %	45 %	80 %	60 %	80 %	25 %	30 %	65 %	90 %	75%	90 %	40 %	50 %	65 %	70 %	70 %	62 %
Product Experience	25 %	60 %	50 %	80 %	45 %	75 %	55 %	80 %	20 %	35 %	60 %	85 %	65%	80 %	35 %	65 %	80 %	75 %	65 %	62 %
Integration & Security	15 %	40 %	35 %	80 %	45 %	70 %	50 %	85 %	20 %	30 %	60 %	85 %	80 %	80 %	40 %	60 %	85 %	70 %	65 %	60 %
Economics	15 %	60 %	50 %	80 %	40 %	70 %	50 %	70 %	25 %	30 %	60 %	85 %	65 %	70 %	40 %	65 %	75 %	60 %	70 %	59 %
Disruption Potential	20%	60 %	50 %	75 %	35 %	65 %	50 %	70 %	20 %	25 %	50 %	80 %	65 %	90 %	35 %	60 %	80 %	80 %	60 %	58 %
Vendor Performance		52 %	46 %	80 %	36 %	56 %	44 %	76 %	24 %	34 %	62 %	81 %	66 %	85 %	48 %	40 %	66 %	70 %	48 %	
Strategy	25 %	55 %	35 %	80 %	40 %	60 %	45 %	70 %	25 %	35 %	65 %	85 %	75 %	80 %	50 %	40 %	70 %	70 %	55 %	58 %
Footprint	20 %	40 %	50 %	75 %	35 %	50 %	40 %	80 %	20 %	30 %	60 %	70 %	60 %	80 %	45 %	40 %	70 %	55 %	30 %	53 %
Ecosystem	15 %	45 %	50 %	85 %	25 %	55 %	45 %	75 %	25 %	35 %	55 %	90 %	70 %	100 %	45 %	35 %	45 %	60 %	50 %	55 %
Customer Experience	20 %	60 %	50 %	80 %	35 %	55 %	45 %	80 %	25 %	30 %	65 %	80 %	55 %	85 %	50 %	40 %	75 %	80 %	55 %	58 %
Agility	20 %	55 %	50 %	80 %	40 %	60 %	45 %	75 %	25 %	40 %	60 %	80 %	70 %	85 %	50 %	45 %	65 %	80 %	50 %	59 %

VENDOR ANALYSIS | Managed Hybrid Cloud Provider

	Gewichtung	Accenture	Adlon	Akquinet	All for One Steeb	Allgeier	Arvato Systems	Atos	Axians	Bechtle	BTC	CANCOM	Capgemini	Claranet	Comparex	Computacenter	Datagroup	Dimension Data	DXC	IBM	Materna	MT AG	PlusServer	QSC	Rackspace	Seven Principles	Sysback	sysEleven	T-Systems	Durchschnitt
Product Value Creation		82 %	60 %	31 %	52 %	18 %	54 %	52 %	40 %	55 %	53 %	66 %	48 %	65 %	24 %	45 %	46 %	59 %	71 %	74 %	55 %	46 %	64 %	54 %	60 %	38 %	48 %	52 %	81 %	
Product Portfolio	25 %	85 %	65 %	35 %	40 %	20 %	70 %	60 %	45 %	55 %	60 %	70 %	50 %	70 %	25 %	55 %	45 %	65 %	80 %	80 %	60 %	50 %	65 %	60 %	65 %	40 %	50 %	55 %	85 %	57 %
Product Experience	25 %	85 %	60 %	35 %	55 %	15 %	60 %	40 %	40 %	55 %	55 %	65 %	45 %	65 %	25 %	45 %	50 %	60 %	75 %	75 %	55 %	45 %	60 %	55 %	65 %	35 %	50 %	55 %	85 %	54 %
Integration	25 %	85 %	60 %	30 %	65 %	20 %	45 %	60 %	45 %	65 %	55 %	70 %	55 %	75 %	25 %	40 %	50 %	60 %	75 %	75 %	55 %	50 %	75 %	55 %	65 %	40 %	50 %	50 %	80 %	56 %
Economics	15 %	70 %	55 %	25 %	45 %	20 %	40 %	40 %	30 %	50 %	40 %	55 %	40 %	50 %	20 %	40 %	40 %	50 %	50 %	65 %	50 %	40 %	55 %	45 %	45 %	35 %	45 %	50 %	70 %	45 %
Disruption Potential	10 %	75 %	50 %	25 %	50 %	15 %	40 %	55 %	30 %	40 %	40 %	60 %	45 %	50 %	20 %	40 %	40 %	50 %	55 %	65 %	45 %	40 %	55 %	50 %	45 %	35 %	40 %	45 %	75 %	46 %
Vendor Performance		84 %	48 %	36 %	53 %	21 %	67 %	69 %	56 %	62 %	42 %	76 %	74 %	54 %	34 %	66 %	39 %	70 %	65 %	83 %	44 %	46 %	63 %	58 %	53 %	44 %	27 %	36 %	74 %	
Strategy	20 %	90 %	45 %	35 %	60 %	20 %	75 %	70 %	55 %	55 %	45 %	80 %	75 %	50 %	35 %	60 %	45 %	60 %	80 %	80 %	45 %	45 %	70 %	55 %	60 %	45 %	25 %	35 %	70 %	56 %
Footprint	35 %	85 %	50 %	35 %	55 %	20 %	65 %	75 %	60 %	65 %	35 %	75 %	75 %	50 %	30 %	70 %	40 %	75 %	75 %	90 %	40 %	45 %	65 %	55 %	45 %	45 %	25 %	30 %	80 %	56 %
Ecosystem	20 %	80 %	50 %	35 %	40 %	20 %	75 %	70 %	50 %	60 %	50 %	70 %	70 %	70 %	35 %	60 %	35 %	60 %	50 %	85 %	45 %	50 %	60 %	60 %	70 %	40 %	30 %	40 %	75 %	55 %
Customer Experience	20 %	80 %	45 %	40 %	55 %	25 %	60 %	55 %	55 %	65 %	45 %	80 %	75 %	50 %	35 %	70 %	35 %	80 %	50 %	80 %	45 %	45 %	55 %	65 %	45 %	45 %	30 %	40 %	70 %	54 %
Agility	5 %	80 %	45 %	40 %	60 %	25 %	50 %	65 %	50 %	55 %	40 %	70 %	65 %	50 %	40 %	70 %	35 %	75 %	50 %	55 %	50 %	50 %	60 %	60 %	45 %	40 %	30 %	40 %	55 %	52 %

CRISP VENDOR UNIVERSE | CLOUD COMPUTING VENDOR & SERVICE PROVIDER

CLOUD COMPUTING VENDORS AND SERVICE PROVIDERS IN PROFILE

Accelerator
- 1&1 Internet/ProfitBricks
- AWS
- Google
- IBM
- Microsoft
- Salesforce
- SAP
- T-Systems

Innovator
- Alibaba
- CenturyLink
- DigitalOcean
- gridscale
- OVH

Emerging Player
- CloudSigma
- Exoscale
- Joyent
- Oracle
- QSC
- ZOHO

Challenger
- NTT
- Vodafone

Accelerator
- Akamai
- Barracuda
- Check Point
- Cisco
- Forcepoint
- IBM
- McAfee
- Micro Focus
- Microsoft
- Palo Alto Networks
- Symantec
- Trend Micro

Innovator
- Fortinet
- HyTrust
- Ionic
- Netscope
- Qualys

Emerging Player
- Aqua Security
- Avanan
- bitglass
- Cipher Cloud
- Cryptzone
- Dome9
- LaceWork
- Sumo Logic

Challenger
- Kaspersky
- Manage Engine
- Sophos

Cloud Platforms - IaaS & PaaS

Cloud Security Management Platforms

CRISP VENDOR UNIVERSE | CLOUD COMPUTING VENDOR & SERVICE PROVIDER

CLOUD COMPUTING VENDORS AND SERVICE PROVIDERS IN PROFILE

Accelerator	Innovator	Emerging Player	Accelerator	Innovator	Emerging Player
Canonical	CenturyLink	alauda.io	Avanade	Cloudwürdig	Beck et al.
Claranet	Containership	Kinvolk	Claranet	Root360	Cloudpilots
GiantSwarm	gridscale	Kublr	CloudReach	Zoi	innoQ
Joyent Triton	Tencent Cloud	Mirantis	direkt gruppe (IQ3 CLOUD)		kreuzwerker
Loodse	weaveworks	Nirmata	Netlution		Retarus
Mesosphere		spotinst	Nordcloud		
Pivotal		Teutostack	Rackspace		
Platform9		Challenger	Reply		
PlusServer		DXC	TecRacer		
Rackspace		IBM	the unbelievable machine company (*um)		
Red Hat		Oracle			
SUSE		Samsung			

Managed Kubernetes & Container Services

Managed Public Cloud Provider

CRISP VENDOR UNIVERSE | CLOUD COMPUTING VENDOR & SERVICE PROVIDER

CLOUD COMPUTING VENDORS AND SERVICE PROVIDERS IN PROFILE

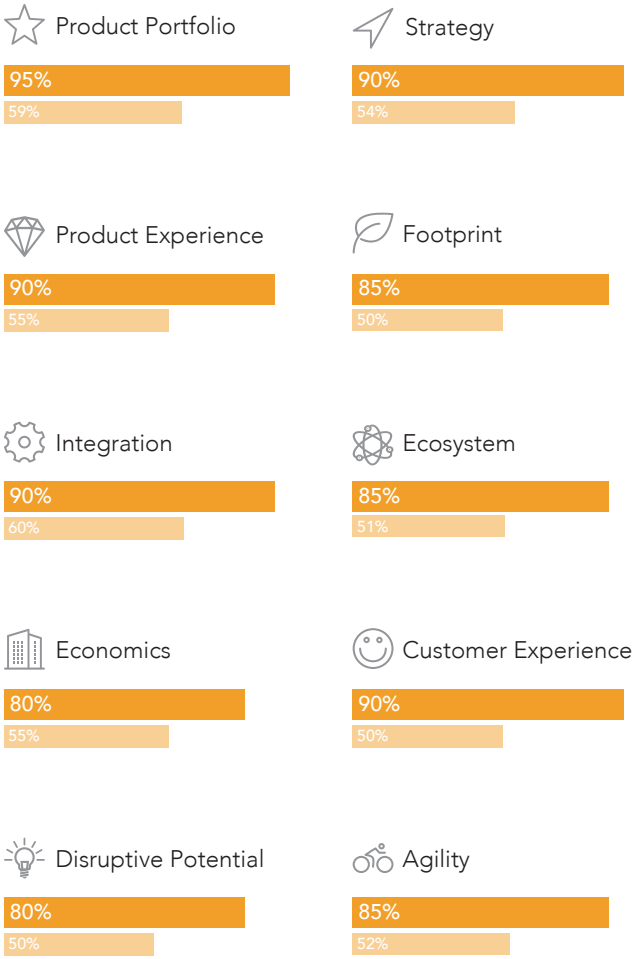
Accelerator	Innovator	Emerging Player	Challenger
Accenture	Adlon	Akquinet	Axians
All for One Steeb	BTC	Allgeier	Capgemini
Arvato Systems	gridscale	Comparex	Computacenter
Atos	Materna	Datagroup	
Bechtle	sysEleven	MT AG	
CANCOM		Seven Principles	
Claranet		Sysback	
Dimension Data			
DXC			
IBM			
PlusServer			
QSC			
Rackspace			
T-Systems			

Managed Hybrid Cloud Provider

CRISP VENDOR UNIVERSE | CLOUD COMPUTING VENDOR & SERVICE PROVIDER

AMAZON WEB SERVICES

Cloud Platforms - Iaas & PaaS



Amazon Web Services: Cloud Platforms - IaaS & PaaS
Average Value

CLOUD COMPUTING PORTFOLIO

Amazon Web Services was founded in 2006 as a subsidiary of Amazon and is a provider of an extensive portfolio for public cloud platforms and services. The AWS Cloud is globally available and stretches over 55 availability zones across 18 different geographic regions with 12 further availability zones and 4 more regions in the planning stage. AWS currently offers the biggest portfolio when it comes to automating platform services for infrastructure, application development, operations optimization or the development of IoT architectures. Further, AWS partners with technology providers such as SAP or VMware to improve seamless application operations or to facilitate hybrid cloud management.

ANALYST VIEW

Amazon Web Services is the leading cloud platform provider and with a diverse portfolio of infrastructure options and platform services particularly attractive for developers and large companies. The high user experience and platform performance world-wide attributes to the most important USPs and distinguishing factors for AWS compared to the competitors and with the current innovation and development speed, AWS positions itself as the Thought Leader within the cloud environment. As founder and companion of numerous strategic IT trends, AWS, along with their partners, is able to further pave the way for cloud adoption in Germany. In regard to the competitive situation, a further portfolio expansion and integration of Open Source tools will be necessary to ensure optimum operation, though.

STRENGTHS

- Extensive and complete portfolio of platform and microservices
- Experienced partner network and ecosystem
- High innovation power and response time to new requirements and security standards

WEAKNESSES

- Hard to keep track of updates and releases or requires external know-how
- Only rudimentary industry focus
- Competitive situation of Amazon as umbrella brand becoming a strategic problem for AWS

3

APPENDICES

PROCESS AND METHODOLOG

In the third edition of the Crisp Cloud Computing Vendor Universe, analysts and consultants from Crisp Research have once again undertaken an analysis of the development of the most important market categories around Cloud Computing, and the key vendors/service providers active within them. In particular, the evaluation is focused on the requirements of medium-sized and large companies that are searching for suitable Cloud partners and service providers within the context of their digitization strategies and the further development of their IT infrastructures. The results of the completed analyses include, among other things:

- Manufacturer ratings and positioning within the "Crisp Vendor Universe" Quadrant
- Detailed analysis of the scoring model for market comparisons
- Strengths and weaknesses of the providers, their portfolios and their impact on Cloud Computing
- Analyst statements on strategies and portfolios

The analysis inputs that form the basis of our conclusions include user surveys, manufacturer information, expert interviews and results of Crisp Research's own studies. This process involves the following four phases:

RESEARCH

Extensive secondary research is carried out which, in addition to reviewing the offerings of the individual providers, also includes an evaluation of Internet and marketing materials, as well as product / service specifications.

PROVIDER SURVEY

Another component is the supplier survey, conducted via a standardized questionnaire. The questionnaire consists of 20-30 questions which help profile the strategy, market positioning, portfolio and the innovation capabilities of each provider.

USER INTERVIEWS

Discussions with market and technology experts, as well as Vendor customers are also important components. In addition, Crisp Research can leverage its broad experience of consulting projects with users to assess the actual performance of providers in real world implementations.

RATING

The three previous phases form the basis for the final evaluation and positioning of the providers. The information and insights gained from each step are consolidated and rated according to pre-defined criteria.

EVALUATION CRITERIA

The evaluation criteria comprise a total of three definition levels. They are divided into two main categories, "Product Value Creation" "and "Vendor Performance", each containing five subcategories. The subcategories (2nd level of definition) include the defining product or service features, and the percentage weighting applied to each. "Product Value Cre ation" focuses mainly on the market maturity of the service offer and is therefore evaluated predominantly on the basis of each Provider's product or service offering. This includes the user experience and implementation options of the solutions, as well as the price point and the added value potential for users. "Vendor Performance" focuses on the strategic and tactical approaches that each company takes in relation to each respective market environment. These include, for example, thought leadership in the respective market, a good partner network, as well as responsiveness and innovation speed. The first two definition levels are standardized independently of the specific market environment and serve as the evaluation foundation for every Vendor Universe.

They always include the following criteria:

SERVICE / PRODUCT VALUE CREATION

- Features
- Service / Product Experience
- Integration
- Economics
- Disruptive Potential

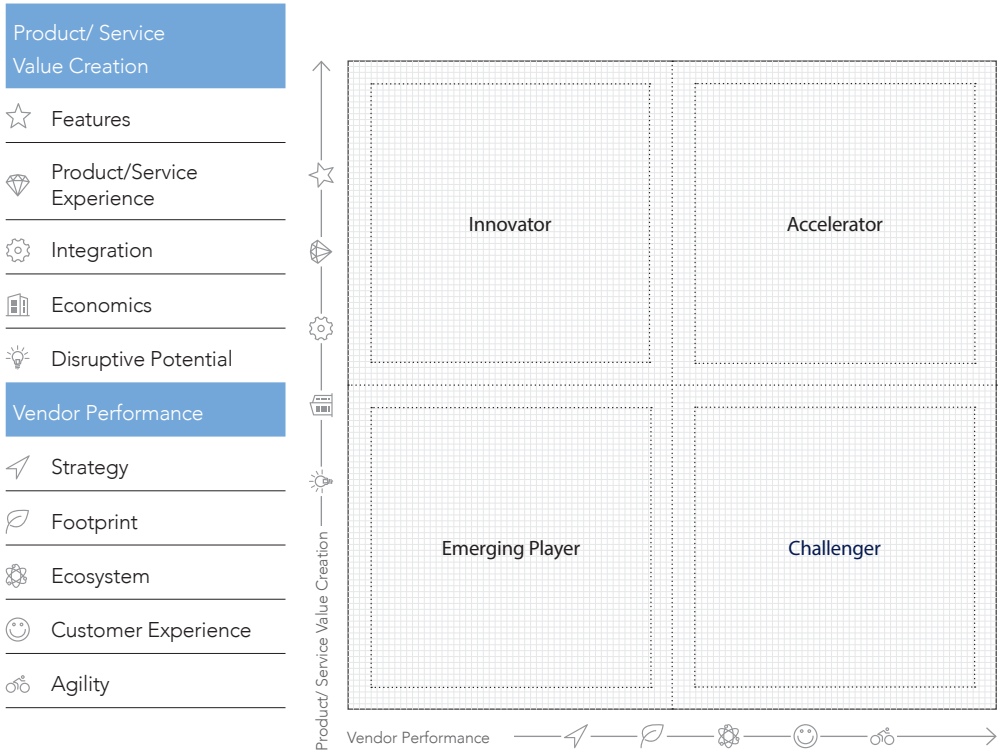
VENDOR PERFORMANCE

- Strategy
- Footprint
- Ecosystem
- Customer Experience
- Agility

At the third definition level, the respective criteria are defined even more closely based on the specific market in question. This ensures that the precise criteria used to rate each Provider are aligned with the requirements of each respective market. This enables Crisp Research to provide a complete Provider rating for both technology Vendors and Service Providers in each market environment.

STRATEGIC CLASSIFICATION WITHIN THE "CRISP VENDOR UNIVERSE"

The Crisp Vendor Universe provides a scoring for each provider made up of a total of 10 sub-criteria. Dependent on the respective main category, each of these criteria is weighted according to the market environment, which in turn gives us an assessment of the maturity of the technology or service ("Product / Service Value Creation") and the strengths of the Provider in the market ("Vendor Performance"). The Crisp Research Vendor Universe Quadrant categorizes each provider into one of the following four fields:



ACCELERATOR

Providers classified as "Accelerators" are the most important players within their respective market environments. Thanks to an attractive portfolio that gives companies optimal support in implementing their respective business project, as well as a clear strategy, organization and visibility, the Accelerators belong on every supplier shortlist.

INNOVATOR

"Innovators" are characterized by an attractive portfolio and a high level of technological competence. Product and service innovation and development potential are particularly high among Innovators. However, these providers often lack general visibility and awareness among users, indicating that they need to evolve their approach, especially at a strategic level.

CHALLENGER

"Challengers" have a strong market and competitive position but have a lot of catching up to do at the technology or service level and are behind the Accelerators in terms of the degree of implementation and innovation they have achieved.

EMERGING PLAYER

Companies positioned as "Emerging Players" are still lacking a mature technology or range of services. At the same time, various other deficits and improvement potential in terms of market and competitive positioning are also easily identifiable. As relevant providers however, Emerging Players still have the potential to develop into attractive Providers if they evolve their portfolio and strategy sufficiently.

RELATED RESEARCH

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  https://www.crisp-research.com/software-ag-wird-mit-cumulocity-zu-einer-iot-plattform-option/

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- **Report** "Security by Design - Die Rolle von IT-Sicherheitsstrategien in der Digitalisierung, October 2017

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ABOUT CRISP RESEARCH

Crisp Research AG is an independent IT Research and Consultancy company. Through its team of experienced analysts, consultants and software developers, Crisp Research evaluates current and future market and technology trends. Crisp Research also supports companies in the digital transformation of their IT and business processes.

Analysis and commentary from Crisp Research is published and discussed across a wide range of specialist business and IT magazines and social media platforms. As "Contributing Editors" to leading IT publications (Computerwoche, CIO, Silicon et al.), as well as highly engaged BITKOM members and in-demand keynote speakers, our analysts actively contribute to de- bates around new technologies, standards and market trends, and are highly in uential within our industry.

Crisp Research was founded in 2013 by Steve Janata and Dr. Carlo Velten, and focused its re-search and consultancy activities on "Emerging Technologies" such as Cloud, Analytics or Digital Marketing, and their strategic and operational implications for corporate CIOs and busi-ness decision makers.

CLOUD COMPUTING - RESEARCH TEAM

Maximilian Hille

Maximillian Hille is an analyst and mobile practice lead at IT research and consulting rm Crisp Research AG. He is responsible for market research initiatives and consulting projects primarily in the elds of mobile business and enterprise mobility. Before that, Maximilian was a Research Manager within Experton Group AG's "Cloud Computing & Innovation Practice".

He is also Product Manager for web service research at Crisp Analytics. His focus topics include the mobile user experience, mobile application performance, mobile development platforms, enterprise mobility and mobile collaboration.

He will also be a juror at the Global Mobile Awards 2018.

Michelle Baum

Michelle Baum is an Analyst with Crisp Research with focus on cloud computing, IT operations, digital infrastructures and data analytics, consulting and enabling companies throughout their digital transformation of their IT and business processes within individual client projects.

Previous to Crisp, Michelle was working in the IT Transaction Advisory service line at Ernst & Young, consulting M&A activities such as Carve-Out Readiness, support of integration processes and PMIs, operational and IT Due Diligence and IT restructuring.

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