



Cloud Vendor Benchmark 2016 Strategy Paper

Germany



Cloud Vendor Benchmark
Leader Germany

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An Analysis by
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an ISG business

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Preface

In 2016, Experton Group has again conducted an independent analysis of the German market for cloud technologies, services and transformation services. This is the seventh edition of this benchmark for Germany. Based on a total of about 450 vendors in Germany, Experton Group identified 155 vendors that are relevant for the German market and have been selected for a detailed analysis and positioning within the benchmark. These are impressive results that demonstrate the role of cloud computing in today's business world, and in particular in the German economy. The market continues to grow, driven by digitalization and ICT trends such as big data. More and more users are realizing the relevance of IT as a production factor and of cloud computing as the basis for modern business models and global connectedness. This has increased the demand for cloud services accordingly.

The market is undergoing continuous transformation and is evolving into the foundation of the digital economy. Cloud transformation specialists are highly sought-after and help user organizations to move into the cloud and to explore new business models. In the wake of these developments, a combination between cloud resources and big data becomes increasingly important, and respective data specialists are emerging. In the as-a-service segment, and especially the public cloud market, the wheat is being separated from the chaff. Continuous innovation and price reductions make this market a highly competitive (and challenging) segment for local providers with relatively limited scaling capacities. This often takes a toll: Local providers are exiting this market, which is dominated by hyperscalers, or must consider partnerships.

The managed services business is booming as never before and is evolving into the "saving hand" for the midmarket, based on specialized operations services and cooperation with public cloud providers, mostly hyperscalers AWS and Microsoft. As a result, midmarket end-users are getting fully involved in this market, not only due to optimized transparency, industry certifications, and EU/German compliance, but also due to availability of lightweight, modular, microservice-oriented software-as-a service offerings. Increasingly, these offerings also address industry-specific requirements. The platform segment is also making enormous progress, providing services that break-down monolithic large-scale systems into small, flexible components, opening the ability to migrate mainframe Cobol apps into more or less cloud-native or cloud-compliant apps. The PaaS market also addresses local application development requirements with respective legacy migration offerings, and also builds up additional differentiation through enterprise integration solutions, acting as glue for heterogeneous system landscapes.



The development of Amazon Web Services (AWS) in the cloud business is absolutely outstanding. Over the past years and in the context of old-established IT service providers, AWS has managed to develop from a pioneering outsider to a true Cloud leader. And not just in the core segment "Infrastructure as a Service (IaaS)" in the public cloud market, but now also in four other segments "IaaS – Public Cloud Storage", "Cloud Workplaces", "Big Data Analytics as a Service" and "Platform as a Service (PaaS) – Development Solutions". This clearly shows that AWS is a focused player in the cloud market, which is known for technological interoperability, performance and safety.

Kassel, December 2016

Heiko Henkes
Director Advisor & Cloud Lead



IaaS – Public Cloud (Self-Service)

Between 2015 and 2020, the public cloud market in Germany will experience a compound annual growth rate (CAGR) of 26 percent. We also expect that by 2020, about 40 percent of workloads will be provisioned out the public cloud.

IaaS as public cloud infrastructure, providing computing capacities and storage resources at the push of a button, will grow from currently 600 million Euros in 2015 to nearly two billion Euros by 2019. Cloud offerings primarily consist of various compute power (CPU/h) and block and object storage resources, based on the expected load. Based on a high degree of standardization and technological maturity, a maximum of elasticity and automation is ensured to handle peaks without any delays.

IaaS public self-service cloud stands for the provisioning of IT infrastructure components as on-demand cloud service. Often, this kind of cloud resources comprises virtual networks and servers, including storage capacity, and is managed through system or cloud management tools. The “public cloud” deployment model allows companies to access highly standardized cloud infrastructures and services. Access is mostly granted through the public Internet via password-protected dashboard via code or via RESTful web services APIs, protected through SSL and cryptographic credentials.

The customer can use a self-service portal to configure the required resources and services. The physical infrastructure (server, storage, network equipment, data center infrastructure) is owned and operated by the cloud provider. Billing is done, based on the actual usage of service units; calculation is based on various parameters and benchmarks and mostly on an hourly or per-minute basis. It is also possible to agree on monthly billing cycles with contracts of up to 36 months; they come with better terms & conditions, reserved compute power and storage quotas. Cloud service providers must address key requirements to be able to offer IaaS within the self-service public-cloud model. A high degree of automation for booking, provisioning and change management processes is indispensable. Support and service processes should also be automated to ensure quick responses to customers’ requests or new configurations. Besides the self-service aspect, a key user requirement and, thus, a key criterion for this analysis for self-service public cloud IaaS providers, is the scalability of the overall infrastructure platform; after all, the self-service public cloud model only makes sense if customers can scale their applications automatically and within a very short time to several or even several hundreds of systems. Obviously, providers must make significant investments to expand their own data center infrastructures to ensure this high degree of scalability; even temporary bottlenecks could compromise the stability of the whole IaaS platform. Self-service public cloud IaaS providers must provide for respective buffers when planning their server, storage and network infrastructures and have excellent traffic management and load balancing expertise.



Key evaluation criteria and requirements for self-service public cloud services can be summarized as follows:

- Self-service portal with direct service access;
- Easy access through test & trial versions and price transparency;
- Powerful and extremely elastic data center infrastructure (local site is favorable, global network);
- Broad portfolio of infrastructure services (compute power, storage for file services, network, backup etc.);
- High degree of allocation and automation of the platform;
- Optional virus scanners, vulnerability scans and intrusion prevention;
- Automated roll-outs, fail-over concepts and anti-DDoS services;
- PAYG-based usage-based billing and reserved resources with automatic "uplift" to a dynamic or highly elastic and expansive resource pool;
- Ease of use of admin interfaces;
- Provisioning of standards and mechanisms to ensure the performance (CDN services) and security (public Internet bypassing tools);
- Broad partner and ecosystem;
- Template libraries with preconfigured virtual appliances or apps;
- Secure integration & interoperability via API;
- Offering of database tools and block storage;
- Offering of container services for easy app migration;
- Offering of dedicated resources for sensitive workloads.

Even in this highly virtualized market, providers are moving closer to their German customers, which is demonstrated by respective efforts to set up data center operations in Germany to address (potential) customers' privacy and data protection concerns, which also reduces latencies. Other providers might follow suit. The public cloud is therefore now becoming an interesting option for enterprise customers from highly regulated industries with respective high requirements. The market is further developed through expanding the indirect channel and through cooperation with consulting and integration partners.

Technologies are becoming more complex and sophisticated and also more competitive. More and more local providers are not able to compete with the hyperscaler giants, and as a result, Host Europe and HPE have exited this market. During the research phase for this benchmark, Verizon, too, announced plans to exit the public cloud market, and other providers will certainly follow. On the other hand, new players are entering the promising IaaS public cloud segment, including Cloud Sigma and Deutsche Telekom (TDG+TSI), who have engaged in a strategic partnership with Huawei.



Detailed Evaluation: AWS

Strengths/opportunities:

- The platform provides flexible billing (hours, GB, per node, reserved, etc.) with broadband configuration options and very high standards of security and very low degree of risk.
- The system runs on a proprietary technological basis and uses AWS' own market standard (API) as only solution
- AWS has many customers and renowned reference customers.
- AWS provides an extremely high level of security (encryption/client side keys), certifications and compliance.
- The partner ecosystem is still limited in terms of the pure partner number, but is increasing rapidly.
- The rate of innovations is very high, compared to the competition.
- The price/performance relationship is very good.

Advisor Statement

“AWS remains the most popular IaaS pioneer with the broadest portfolio, the largest number of customers and the dominating market standard.”

Experton Market Insight
Cloud Vendor Benchmark 2016 - Germany
IaaS - (Self Service) Public Cloud



Figure 1:
Experton Market
Insight Quadrant -
(Self Service)
Public Cloud



IaaS – Public Storage Cloud

There is an increasing demand for cloud storage, primarily object storage, as a component of infrastructure-as-a-service offerings. Demand for external storage resources, which are experiencing extreme price erosion, is unbroken and for many users this is the primary use case. Dashboards can be used to monitor and provision this storage, and RESTful APIs are used for connecting it to infrastructures.

Based on capabilities such as handling of distributed resources and metadata information, object storage is suitable for shared and remote cloud as well as web access. IDs are assigned to provide associated applications, the relevance of an application, the privacy level, replication requirements, migration information and other details. High relevance is attached to additional block & file storage as well as backup and archiving options. As a result, the market is specializing towards Flash-based high-performance storage services (HOT) for up to 50,000 IOPS and soon much more, and also WARM and COLD categories for read and write access to less intensively used and especially time-critical data and files.

Key evaluation criteria and requirements for providers of IaaS – public storage clouds can be summarized as follows:

- Storage resources from a cloud, without managed services or bundles within compute power units;
- Object and also block to file storage offerings;
- Provisioning of public (shared) cloud resources – optimally via a global network and data centers for USA, Asia and Europe or Germany;
- Availability of transparent APIs and protocols such as REST to dock resources into external enterprise infrastructures;
- Dashboards to book the utilization of storage resources, based on the self-service mode;
- PAYG-based billing, depending on booked capacity and the outbound data transfer (GB per month of storage and used bandwidth);
- Automated provisioning of additional storage resources, starting at a defined degree of utilization and based on defined agreements/quotas;
- Fast overview of cost and storage utilization - per user/company;
- Secure availability and infrastructure redundancy
- Guaranteed availability of at least 99.9%;
- Integrated network security;
- Options to share content/files internally and externally via link;
- Service & support system and local partnerships;
- Reference customers.



Detailed Evaluation: AWS

Strengths/opportunities:

- AWS provides a storage gateway to connect on-premise resources (AWS Storage Gateway).
- AWS S3 is a cost-efficient alternative (data archiving) and provides persistent SSD-based EBS block storage. AWS S3 is THE market standard and all providers want to provide compatibility with this standard.
- Elastic file system for connecting NFS apps and Glacier for backups.
- AWS is a proofed institution: Many Amazon customers rely on the smooth operations of their data that AWS hosts in petabyte range, making the AWS cloud a highly secure platform option.
- Consistent discounts, no minimum quantities or long-years of contractual obligations.
- A management console and actions such as life cycle policies/rules are also available.
- A web-based API and IAM for all storage types of the AWS cloud are automatically included.
- The AWS Frankfurt Region ensures fast connectivity with low latencies. AWS Direct Connect and AWS Import/Export Snowball services facilitate large scale data transfers to/from AWS storage services.

Advisor Statement

“AWS provides a web-based API and IAM for all storage types of the AWS cloud – their Region in Frankfurt ensures fast connectivity and low latencies, based on the only market standard S3.”

Figure 2: Experton Market Insight Quadrant - Public Cloud Storage





PaaS – App Development Platform as a Service (aPaaS)

Platform as a service (PaaS) is evolving and reinventing itself; in 2014, at the latest, this kind of cloud services has gained enormous relevance within the cloud-affine IT industry. PaaS is the cloud hot spot and pivotal for all kinds of interests. Application PaaS (aPaaS) as platform for creating, operating and monitoring applications (available since around 2011), is increasingly available as hosted variant, for instance based on Cloud Foundry/OpenShift (both with open-source federation) or Microsoft Azure via the "Azure Pack".

This type of PaaS constitutes about 80-90% of the overall PaaS market offering and is a field of business that generates low margins for providers, unless ecosystems for applications operations or go-to-market programs are also provided. The app release cycles could be shortened significantly, thanks to the efficiency of these platforms, while market dynamics were increased.

Continued development can be observed both on the demand and the supply side. PaaS is the layer between the IaaS and the SaaS stack and was initially regarded as a mere test & development environment (framework) for application development in the cloud. The cloud is the native place for such purposes and use cases, for testing and development scenarios require scalability and resources must be activated and deactivated quickly.

PaaS market offerings are many, varying from early app-centric services for testing and development scenarios, based on public clouds, to hosted private cloud variants. This type of PaaS falls into the aPaaS category. There is also a trend to link and merge IaaS and PaaS offerings, combining them into a unit; this principle has, for instance, been used by newcomer Docker with the container approach. There is hardly any platform that is not compatible with this new, fast-growing ecosystem. By nature, requirements for such cloud environments are rather heterogeneous, depending on the target group, which may be an individual developer, a large enterprise or an independent software vendor (ISV).

Most existing ISV solutions cannot be switched 1:1 to a PaaS platform. Many of these solutions are not "stateless"; they do not provide multi-tenancy capabilities. From a structural perspective, they are more a monolith, rather than a microservice. As a result, their suitability for usage as off-the-shelf solutions from the cloud with infinite scalability is limited. Especially older, none web-compatible app code has no intelligence or interface compatibility to dynamically change underlying resources in cases of peak loads or respective service needs through image management for computer power and storage pools. The old app generation can neither be used to implement the required modularity for mobile scenarios and multiple front-ends, based on various worker types

ISVs are therefore challenged to evaluate available offerings that do not only provide traditional on-premise development stacks and existing PaaS offerings, but also new innovative ecosystems or frameworks to optimize their sourcing process.

Key evaluation criteria and requirements for aPaaS cloud services providers can be summarized as follows:

- Prompt provisioning of the private managed/public cloud service;
- Self-service portal with good usability and transparency (read and write access), price per MB for the code environment and GB for DB as well as additional scaling cost per hour);
- Sophisticated test & development options, including workflows and logging/reporting functionality for rollouts;
- Provisioning and import of databases (relational and non-relational, such as xSQL, MongoDB, Cloudant and Redis);
- Automated provisioning of required resources (scale up/down) and infrastructure or platform sizing support (t-shirt), including. server roles, certificates and ports (via script);
- Support of multiple development tools, OS and technologies, platform management automatism; Developer go-to-market programs;
- Workflow support for agile development methodologies (SCRUM);
- Easy handling of template libraries used for VMs or virtual appliances, clustered by use cases or development scenarios;
- Different development environments;
- Open architecture, interoperability and well documented (web service) APIs or middleware/integration layer to merge multiple clouds or services and also platforms;
- Security architecture/features including SSO;
- Container connection and integration; Portability of the solution
- Persistent (file) storage and templates for subsequent operations;
- Options for public cloud services and instances for hosted managed operations;

Not only the public IaaS-, but also the aPaaS-segment shows that this market is becoming increasingly competitive and that providers are struggling to demonstrate respective differentiation and USPs, also due to the Cloud Foundry dominance, the open-source framework that is used and advanced by many commercial cloud providers. The market becomes less densely populated, technologies are becoming more complex and sophisticated and also more competitive. Compared to last year's benchmark, the following providers were not included anymore in our analysis of this cloud segment, due to a lack of references and decreasing revenues and market awareness: TIBCO, *um and cloudControl. cloudControl became insolvent and was acquired by Swiss provider Exoscale. Other market exits may follow. Progress, last year's Rising Star, was not able to maintain their momentum and keep their go-to-market promises and could therefore not meet respective expectations.



Detailed Evaluation: AWS

Strengths/opportunities:

- AWS provides very interesting enablement programs for traditional ISVs to help them break down monolithic applications into microservices, which is certainly a USP!
- Other positive aspects include the DevOps support and the availability of frameworks for continuous improvement in multiple languages.
- Virtual machines, containers and functions/features such as IAM, SQS (message service) are also available.
- CloudFormation for resource management and Cloudtrail for API logs are also included in the offering.
- Advancement of the service as well as tools, templates and samples for higher transparency and jump starts, including software provision tool chains, are exemplary.
- AWS Lambda as event service is now available in the EU with Python support, which further strengthens AWS' position. With this invention, AWS was again a pioneer in providing innovative tools to build serverless infrastructures that users require more and more. Other providers also saw the rising demand for event driven Cloud Tools for a higher grade of automation and

Advisor Statement

“AWS provides leading-edge technology, including tool chains and support of state-of-the-art, agile app development. Traditional ISVs with monolithic applications are supported to help them transform existing solutions into microservices.”

Figure 3: Experton Market Insight Quadrant - aPaaS





SaaS – Cloud Workplaces (XaaS)

While virtual desktop infrastructure (VDI) management and virtual desktop hosting within a private cloud environment are certainly nothing new in the IT services market, the cost-efficient provisioning of standardized workplace services out of a shared private cloud or public cloud definitely are a relatively new to the market. Two years ago, Experton included standardized workplace services into their analysis for the first time; these are preconfigured and modularized packages provisioned (as a service) from the cloud (public, shared hosted) at a fixed rate per user and month. This market segment has evolved through competitive pressures exerted by Amazon Web Services (AWS), which caused providers of individual hosted desktop services to enter this segment before their customers switch to the competition.

Key evaluation criteria and requirements for cloud workplace services providers can be summarized as follows:

- Scope of portfolio, demonstrated by the number of standard packages (tailored for specific user groups), modularized additional options and individual add-ons
- Quality of portfolio, proven through a differentiating portfolio, delivery, customer satisfactions, price/performance and technology basis
- Local strengths/specific characteristics, based on new customer contracts/references, infrastructure (data center & network) and customer support
- Strategic focus and advancements, in particular towards 3D CAD and integration with SaaS marketplaces

QSC is the only newcomer in this segment. As we have already observed in the last benchmark, many providers seem to perceive only limited opportunities to catch up with established providers. Portfolio attractiveness and speed are key, since respective economies of scale constitute a clear competitive advantage when it comes to standardized cloud workplaces. Market shares have more or less been distributed, and individual heavyweights have emerged. While Deutsche Telekom (TSI) is the established “vendor of choice” in the large accounts segment, CANCOM/PIRONET is the preferred vendor in the midmarket segment and AWS is most popular among small businesses. As a matter of course, all of these providers also try to gain a foothold and market shares in other segments. Deutsche Telekom (TSI), CANCOM/PIRONET and AWS have demonstrated a clear strategic focus on the market segment and were able to establish themselves as the leading providers. For many other providers, this market is a mere add-on business to existing individual desktop services, often simply to provide a more or less adequate offering to compete with AWS and to prevent customers from considering a switch to another provider.



Detailed Evaluation: AWS

Strengths/opportunities:

- Amazon Web Services (AWS) is the innovator in this market segment, has a modular infrastructure and application offering and demonstrates their strategic focus on the fast and targeted enhancement and advancement of their offering.
- AWS lifts their cloud workplaces to a new level by integrating them with the AWS cloud marketplace. Since early 2015, customers have been able to use the Workspace Application Manager to directly access applications within a selected category within the cloud marketplace (AWS Marketplace for Desktop Apps) and provision them directly in their own workspace.
- Some applications can be uploaded directly through the AWS Application Manager and can be provisioned to the staff within workspaces.
- AWS provisions these services increasingly from a German Region (and also recently launched Workspaces and Directory Services in France) and ensures compliance with numerous security certifications.

Advisor Statement

“AWS connects cloud workplaces to their SaaS marketplace and is one step ahead of the competition.”

Experton Market Insight
Cloud Vendor Benchmark 2016 - Germany
SaaS - Cloud Workplaces (XaaS)



Figure 4: Experton Market Insight Quadrant - Cloud Workplaces (XaaS)



About AWS

In 2006, Amazon Web Services (AWS) began offering IT infrastructure services to businesses in the form of web services -- now commonly known as cloud computing. One of the key benefits of cloud computing is the opportunity to replace up-front capital infrastructure expenses with low variable costs that scale with your business. With the Cloud, businesses no longer need to plan for and procure servers and other IT infrastructure weeks or months in advance. Instead, they can instantly spin up hundreds or thousands of servers in minutes and deliver results faster.

Today, Amazon Web Services provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers hundreds of thousands of businesses in 190 countries around the world. With data center locations in the U.S., Europe, Brazil, Singapore, Japan, and Australia, customers across all industries are taking advantage of the following benefits:

Low Cost

AWS offers low, pay-as-you-go pricing with no up-front expenses or long-term commitments. AWS is able to build and manage a global infrastructure at scale, and pass the cost saving benefits onto customers in the form of lower prices.

Agility and Instant Elasticity

AWS provides a massive global cloud infrastructure that allows customers to quickly innovate, experiment and iterate. Instead of waiting weeks or months for hardware, customers can instantly deploy new applications, instantly scale up as your workload grows, and instantly scale down based on demand.

Open and Flexible

AWS is a language and operating system agnostic platform. Customers choose the development platform or programming model that makes the most sense for their business. Customers can choose which services to use, one or several, and choose how to use them. This flexibility allows customers to focus on innovation, not infrastructure.

Secure

AWS is a secure, durable technology platform with industry-recognized certifications and audits: C5, PCI DSS Level 1 Version 3.2, ISO 27001, FISMA Moderate, FedRAMP, HIPAA, and SOC 1 (formerly referred to as SAS 70 and/or SSAE 16) and SOC 2 audit reports. AWS services and data centers have multiple layers of operational and physical security to ensure the integrity and safety of customers' data.



About Experton Group

Experton Group is the leading fully integrated research, advisory and consulting company. Experton Group supports large enterprises as well as midmarket businesses with their IT strategic planning and implementation through innovative, neutral and independent consulting and advisory services to help them maximize the business value of their ICT investments.

Experton Group provides market research, advisory services, assessments, benchmarks, conferences, seminars and publications on information and communications technology topics. The scope of services includes technology, business processes, management and M&A.

Experton Group was founded in 2005 by very experienced market research and consulting experts; in March 2016, Experton Group became a subsidiary of Information Services Group.

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