

Agile data center – a guide for the perfect partnership

With digitization, the storage and management of large amounts of data is becoming increasingly important. Both e-commerce companies and digital service companies face the challenge of whether to have their IT infrastructure managed internally by specialists, or outsourced. The relocation of IT resources is a major step for every company and must be well thought out and planned in advance. Data centers must meet very high standards in terms of operational security and privacy policy. This presents IT departments with many challenges and questions. For instance: What types of data centers are there? What added value do they offer? What do I have to consider when choosing my new business partner? The subsequent guide highlights the five most important aspects and is designed to help you find your perfect data center.

The different types of data centers

Definition

DIFFERENT TYPES OF DATA CENTERS

In general, a data center consists of premises which accommodate both the central data processing technology of one or more companies (customer) as well as the servers of the organisation (operator) which manages said data processing technology.

Distributed vs. container

DIFFERENT TYPES OF DATA CENTERS

A distinction is made between a distributed data center and a container data center. Distributed data centers are characterized by the fact that their premises are situated in different buildings at separate locations – or in First Colo's case in separate fire compartments within the same building. In contrast, container data centers accommodate all the necessary equipment in a portable container. A second data center which reflects the resources of the primary site, is referred to as a disaster recovery location. In the event of asymmetric reflection of data, the distance between the individual sites is irrelevant. In case of symmetric reflection, however, a distance of 100 kilometres to the disaster recovery location should not be exceeded. Doing so will result in the transmission delay to become too large and the disaster recovery location fails to fulfill its purpose.

Colocation

DIFFERENT TYPES OF DATA CENTERS

For some time now, service providers have been specializing in providing premises specially designed for the operation of IT infrastructures. Customers can set up and operate their own IT equipment in these premises. This service is known as colocation service and corresponding data centers are called colocation data centers.

From software-defined-data centre to cloud

DIFFERENT TYPES OF DATA CENTERS

If the processes in a data center are defined and automated entirely by software, these data centers are referred to as software-defined-data centers (SDDC). Modifications to the requirements of the individual applications can be initiated centrally across all infrastructure levels with the help of a handful of commands.

In recent years technical advances were made possible by new IT architectures. Particularly virtualization is increasingly introducing innovations in data centers. Virtualization uses an abstraction layer to divide IT resources such as servers into several logically separate areas, which are independent of the underlying hardware. These so-called virtual machines (VM), are accessed by different users and

From software-defined-data centre to cloud

DIFFERENT TYPES OF DATA CENTERS

applications and can be moved between physical servers by software commands. If all elements of the infrastructure of the data center are completely virtualized and integrated, it is referred to as a cloud data center. This type of data center provides users with various IT services via web interfaces and in some cases even with a self-service architecture.

If such a cloud data center is company-owned and operated, it is called private cloud. In contrast, if the cloud data center is operated by an external service provider, who provides all services on an entirely virtualized cloud infrastructure and makes those accessible to only a single customer the infrastructure can be described as a managed private cloud. If the infrastructure is accessible to several customers, it is called public cloud.

If a company's infrastructure incorporates elements of both private and public cloud, it is referred to as a hybrid cloud. Experts see this concept as the dominant operating model in IT in the coming years. A hybrid cloud is primarily software-defined. The integration of hardware combined with automation by software allows for event-driven data center operation. The microservices required for IT services can be specifically called up and switched off once again. The central idea of microservices is the breakdown of complex and maintenance intensive applications, into fault-tolerant and highly scalable service units in order to considerably facilitate management thereof. Despite this advantage, microservice architectures also pose challenges. In such an architecture, the service units must be able to communicate efficiently with one another, while at the same time ensuring the agility and elasticity of the applications.

IaaS/PaaS/SaaS

DIFFERENT TYPES OF DATA CENTERS

In terms of services, data centers can be divided into three types: If the operator of a public cloud merely provides the hardware infrastructure required to run the IT applications, the data center is referred to as IaaS (infrastructure-as-a-service). If the operator assumes responsibility for both the middleware and the operating system, the data center is referred to as a PaaS (platform-as-a-service) data center. In case the operator provides customers with complete software services, the data center is called SaaS (software-as-a-service) data center. With all these different types of offering, the billing is usually based on usage.

Advantages for customers

Cost of Advantage

ADVANTAGES FOR CUSTOMERS

Cost efficiency is often an important consideration when deciding whether to outsource corporate IT to a colocation data center. When outsourcing business-critical applications, the costs and required services are agreed on in advance with the data center operator and can therefore be calculated at any time. Outsourcing has significant advantages, especially with respect to initial investment costs for software and hardware: The IT equipment is always state-of-the-art, and the cost of maintenance is covered by the service provider. Hence, customers can immediately focus on their core business and without large investments. In addition, the maintenance of the infrastructure is handled by experts, who are also readily available as personal contacts. In addition, most service providers offer 24/7/365 support for emergencies, while guaranteeing all associated service level agreements (SLA's).

Availability

ADVANTAGES FOR CUSTOMERS

Organisations which outsource their infrastructure to a data center also benefit from the highest levels of availability and lowest latency. Furthermore, data centers feature multiple redundancies and are often located in the vicinity of large peering points to ensure the best transmission speed possible. The redundancy allows for the servers to run with minimal planned downtime. In addition, there are several facilities which are necessary for the operation. Hence, individual components can be replaced regularly and without any impact on the data center operations. As a result, customers benefit from the highest degree of availability for their IT infrastructure.

Legal requirements (fire prevention and data protection)

ADVANTAGES FOR CUSTOMERS

The technical equipment in server rooms of data centers causes an increased fire hazard due to the high energy density. If companies seek to maintain their infrastructure by themselves, they must address all legal requirements - and inevitably comply with them. Outsourcing this responsibility to a professional service provider guarantees optimal protection of the infrastructure without any effort on the clients' end. Professional data centers are continuously monitored and feature several fire compartments within the premises, in addition to area-wide fire extinguishing systems. In case of an emergency, this ensures fastest detection and prompt intervention. Furthermore, infrastructures are often subject to multi-level security zones and biometric access controls. The result is the highest level of security for all IT equipment and corresponding data. Especially in times of the GDPR, the protection of data is becoming increasingly important. Professional data center operators at European sites always comply with the strict regulations and

Legal requirements (fire prevention and data protection)

ADVANTAGES FOR CUSTOMERS

thus ensure the safety of business-critical information. Therefore, customers of these operators do not need to be concerned about data breaches.

Sustainability

ADVANTAGES FOR CUSTOMERS

In addition, service providers aim to achieve efficient and, above all, sustainable energy management in data centers. Many service providers optimize the air conditioning of their infrastructures through extensive measures that even exceed government requirements and thus make a positive contribution to a better carbon footprint. If customers attach great importance to environmental protection, many service providers can support them in protecting the resources of the future.

The future of data centers in the cloud era

Data backup in data centers

DATA BACKUP

In the course of technical innovations, everybody is talking about the cloud. Economic advantages make it particularly attractive for companies to move their infrastructure to the cloud. For instance, the cloud requires minimal administrative effort and offers demand-oriented network access to resources. Despite this, the assumption that clouds can easily take over the most important functions of data centers and that customers are just as well served in a private cloud solution is far too short-sighted. In addition to scalability and availability, an efficient data center offers many other advantages, especially in terms of data protection and intrusion prevention.

Why migrate to a data center?

Before attempting to answer this question, it makes sense to consider the specific advantages and disadvantages of migrating to a data center.

Advantages

- ✓ SLA's create transparency and security; they describe the services to be provided by the operator and therefore provide the customer with contractual security
- ✓ Data centers offer flexible scalability, because software and hardware can be provisioned very quickly and extended flexibly
- ✓ Multiple redundant connection to the Internet
- ✓ 24/7 monitoring and support for hardware and operating systems, replacement of defective components in the shortest time possible
- ✓ Uninterruptible power supply and air conditioning
- ✓ Access protection and fire extinguishing system for emergencies
- ✓ Complete control through root or administrator access as well as efficient system maintenance through standardized hardware and operating systems
- ✓ Use of the latest technologies in the area of storage and networking with additional options for firewall and backup, among others
- ✓ The outsourcing of the IT infrastructure allows for a direct focus on the core business

Disadvantages

- ✗ Less flexibility to realize individual ideas
- ✗ High trust in the provider is a necessity and certifications are often a decisive criterion
- ✗ Standardized hardware and operating systems hardly leave any room for individuality
- ✗ Long-term contracts are often a given

When does a migration make sense?

ADVANTAGES FOR CUSTOMERS

Moving to a data center is particularly beneficial for operators of very sophisticated internet solutions who want to outsource the responsibility for technical maintenance and operation in order to have more time for their core business. It also makes sense to migrate for all those, who are unable to maintain a qualified service permanently in their day-to-day operations and which also meets their availability requirements. This does not mean, however, that the employees of the companies in question are unqualified. Maintenance of IT infrastructures is just a considerable workload. In addition, a migration also has economic and operational benefits, as data centers can deliver many services far more efficiently due to economies of scale. Examples of this are for instance the provision of technical staff or the purchase of hardware components. Nevertheless, the actual cost benefits should be thoroughly examined before migrating. For any company that carry out its own technical maintenance and that has a relatively simple internet solution, a decision against migrating to a data center can be more effective.

What are the things to consider when choosing a service provider?

Energy efficiency

CHOICE OF SERVICE PROVIDER

In case the decision is to migrate, it is important to determine the power consumption of servers and air conditioning of eligible data centers. Decisive factors are efficiency and available redundancy of the cooling capacity. It is also important to consider how the operator purchases electricity and where from. This is essential if you attach great importance to sustainability.

Data management

CHOICE OF SERVICE PROVIDER

In case the decision is to migrate, it is important to determine the power consumption of servers and air conditioning of eligible data centers. Decisive factors are efficiency and available redundancy of the cooling capacity. It is also important to consider how the operator purchases electricity and where from. This is essential if you attach great importance to sustainability. Furthermore, the management of data is a matter of trust. An intrusion in existing data – whether intentionally or against best judgement – can be a disaster for any company. Hence, all providers available for selection should be carefully screened in advance. Avoid companies that appear dubious and prefer German providers if high legal data protection requirements are of relevance. Your company data is indispensable for your success. Careful handling is therefore not only desirable, but a necessity. In addition, another decisive criterion is how the data center is connected to carriers, internet service providers and peering points. As aforementioned, this has a big influence on latencies and therefore on performance in general.

Capacity for scaling

CHOICE OF SERVICE PROVIDER

You should also wonder what capabilities in terms of scaling does a vendor provide. Even if initially a modest infrastructure is sufficient, this may change over time. Some operators provide their customers with a so-called “pay as you grow” model which scales with demand. Hence you only pay for the capacities and services which you effectively use.

High availability

CHOICE OF SERVICE PROVIDER

Ultimately, the availability of servers and of technical support is crucial. Data centers often advertise with very high availabilities of over 99 percent. In conjunction with 24/7 support from the technicians, this is essential as your infrastructure remains accessible almost around the clock.

Checklist for the choice of a service provider

Requirement	To consider
Electricity	How much power do my booked services require and how efficient is the operator?
Privacy policy	Does the data center meet all legal requirements of my country?
Connectivity	Is the provider located in the vicinity of important peering points and can assure me of the best connection?
Redundancy	Is the operator’s infrastructure redundant so that my services can continue to run even in the event of a technical malfunction?
Scalability	Can I easily scale in both directions and only pay for the service, which I effectively use?
Costs	Is the migration to a data center cost effective for me or would it make more sense to maintain my infrastructure myself?

Data center management is becoming increasingly complex - and is a case for specialists

Conclusion

OUTSOURCING

In view of the abundance and complexity of technical and structural security measures, more and more companies are opting to outsource their IT infrastructure to an external data center. This reduces operating and capital costs and saves space. As a premium provider of colocation and cloud services, firstcolo gives your IT systems a secure home. The firstcolo data center experts ensure that your data remains highly available, confidential and secure. And this comes with a letter and seal of approval, as TÜV has certified the firstcolo data center in accordance with the ISO/IEC 27001:2013 standard.

Checklist for choosing a service provider

Requirement	firstcolo
Electricity	Redundant uninterruptible power supply, 20 minutes to backup, network backup systems (DIESEL emergency power generator)
Privacy policy	Compliance with the highest safety and quality standards
Connectivity	Market-leading connectivity, located in vicinity to the world's largest peering point – the DE-CIX in Frankfurt
Redundancy	Fully redundant design of the entire IT infrastructure
Scalability	Highly scalable networking infrastructure
Costs	Adequate hardware capacities allow for short-term realization of IT projects, furthermore the utilisation of managed services by experts

firstcolo is your partner for data center and managed services

As an IT infrastructure provider, firstcolo operates high-availability data centers at German and European server locations with the core competencies of colocation and cloud services, managed services and DDoS protection. The firstcolo data center experts offer related IT services for SMEs and major customers. The IT systems of numerous industries are given a secure, cost-effective and modern home at firstcolo. Our customer base primarily includes companies with above-average demands on service quality and IT security. Further information on our services can be found at

www.firstcolo.net