



Cloud computing on the rise

The outlook is bright for IT clouds

Celebrated by some as the beginning of a new era, and discussed more skeptically by others, cloud computing is the latest buzzword in the IT world. The experts agree, however, that the technology will be a force to be reckoned with, because it lets companies use not only software, but entire infrastructures and platforms much more flexibly and cost-effectively. Despite all the benefits, however, they must also learn to deal with two challenges: trust in their data integrity and the integration of their increasingly heterogeneous IT landscape. Established providers like Siemens IT Solutions and Services, which also functions as a system integrator, focus on precisely these two areas. They offer trusted structures such as private clouds and are able to integrate existing systems into the overall concept. They are also equipped to implement hybrid solutions that are based partly on cloud services and partly on corporate applications.

Paying 100 percent, but using only six percent – a bottom line that lacks any economic logic. But according to the results of a 2008 study conducted by McKinsey and the Uptime Institute, it's standard business at many companies as far as their server capacities are concerned. It's no surprise, therefore, that many experts predict a glorious future for flexible cloud computing. Companies that pay only for what they really need and don't have to maintain an oversized, maintenance-intensive server structure save lots of money while gaining flexibility. Gartner's analysis believes that the technology will have become widespread by 2012.

According to the market research company IDC, expenditures for cloud computing services amounted to 16.2 billion dollars last year and are expected to increase to 42 billion dollars over the next four years. Peter Arbitter, Chief Technology Officer at Siemens IT Solutions and Services, states that the current situation is characterized by strong competition: "There are many providers on the market who are trying to win customers deals in the current economic decline. Companies that previously focused mostly on end customers are increasingly paying attention to the business segment as well. This puts established service providers under pressure and forces them to differentiate themselves accordingly."

Where the clouds come from

People who believe that the technology literally fell from sky are sadly mistaken. As the IT expert explains, "cloud computing represents the logical progression from PCs in the 80s, networks in the 90s and the Internet around the year 2000. Other trailblazers include virtualization on the one hand and Web 2.0 and service-oriented architectures on the other." The approach arose from the idea by providers like Amazon to rent out capacities in their irregularly utilized infrastructure to others. To be ready for the busy Christmas season, for example, Amazon must have thousands of servers at its disposal that are barely being utilized for the rest of the year.

Extensive cloud services are made possible by mature virtualization techniques, access to broadband connections and existing approaches such as grid computing. The latter

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has been used for many years in scientific and research applications: The computing power of many data centers is combined over the Internet to execute complex simulations or calculations. That way, distributed resources can be assigned to different applications as needed. Cloud computing expands this concept to corporate applications such as ERP or storage.

Cloud computing as an innovation engine

“The new technology is being boosted primarily by the current economic situation in which many companies expect such services to provide relief for their budgets through scaling effects or hardware savings. The pay-per-use model pairs cost control with cost transparency. In addition, cloud computing is gaining popularity as a result of more and more ecological initiatives, because sharing IT with many others can save huge amounts of energy,” says Arbitter. “Especially in the infrastructure field, cloud services can improve energy efficiency by a factor of five relative to non-virtualized systems.”

Another major success factor is the new level of flexibility that cloud computing provides. For example, the New York Times used the services of a large provider to digitize roughly eleven million articles as PDF files for its online archive. Maintaining the infrastructure for such processes would exceed the financial and personnel resources of most companies.

Cloud computing enables companies not only to respond more quickly to changing business requirements such as more storage space or more computing power in high-traffic periods. It also enables them to test new applications at relatively low cost or to use this kind of IT to try out new business areas. The flexible scalability and expansion enables them to keep step with business innovations and shorten development cycles without the need for large investments. The same applies for the IT infrastructure itself, because “the users always have access to the latest technology and can benefit from all related improvements. In addition, the high level of standardization provides faster implementation, less maintenance and easier handling,” adds Arbitter.

Cloud computing also supports another trend: The easy access over the Web makes mobile computing easier. Since the data is distributed over multiple data centers all over the globe, it is available anywhere and at any time. Data reconciliations are no longer needed, and redundancies are minimal. With web security cloud services, for example, even tough corporate security guidelines can be complied with from any device in the world. Your employees’ increased mobility makes them more productive and contributes to growth and innovation.

In addition to cloud computing’s many benefits, however, there are also some challenges that should not be underestimated. Arbitter sees these predominantly in two areas: in technical aspects and in the extent of customers’ trust in the security of their data.

The security question: opportunity and risk

According to a study by consulting company Avanade, 65 percent of the 500 companies surveyed worldwide expect cloud computing to produce financial savings. As far as data security is concerned, however, 72 percent put more trust in their own systems. “In many cases, the mistrust is justified, because in most cases the user has no say how and where the cloud provider stores his data. That’s why aspects of data protection should

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be examined carefully in advance, particularly if mission-critical applications are involved,” warns Arbitter. Gartner’s analysts agree that companies should conduct extensive risk assessment with respect to data protection, data integrity, data recovery and compliance before using cloud services. For example, clients should make sure that similar tasks are performed by multiple systems and that data is stored redundantly to keep it available at all times.

“Since the information will be stored in a not exclusively assignable area, strict and largely country-specific data protection and documentation regulations currently present major hurdles on the path to cloud computing,” says the IT specialist. Particularly in highly sensitive areas like finance and healthcare, for example, the data must not be accessible across national borders and only by a limited number of administrators. That’s why there is a huge potential for consulting services that help clients determine where cloud computing services make sense and where they don’t.

Beyond the technical consulting services, transparency is critical. Since multiple companies often share the same cloud, users should know who ultimately handles the encryption and the storage or what will happen to their data when providers change. “This is precisely where Siemens has a lot to offer, because as the sole contact for our customers from start to finish, we are also responsible for the security of their data,” says Arbitter. “Since we function as a full-service provider, there is no need to integrate external infrastructures or third-party platforms to keep sensitive data secure.”

Keeping your very private cloud secure

To ensure a higher level of security, IT service providers like Siemens IT Solutions and Services are increasingly offering so-called ‘private clouds’ where the customer knows precisely in which country or even at which data center his data will be stored. In addition, the data will be transmitted in encrypted form or stored in encrypted databases. That way, the customer can be allocated a specific part of the cloud that does not need to be shared with others. He can even have it managed by specific system administrators. The disadvantage: The more secure the cloud service, the less flexible it becomes since it can no longer be dynamically distributed over multiple resources. The approach also eliminates some of the scaling effects and cost benefits.

Arbitter believes that hybrid approaches will therefore become popular over the long term: Non-critical applications such as messaging will increasingly be operated in the cloud to take advantage of the huge cost benefits, while sensitive data will continue to be managed in dedicated data centers. While this may sound easy, however, it will place huge demands on the interoperability of infrastructures.

Integration into the terrestrial infrastructure

Cloud computing’s primary challenge lies in the need to maintain the same data worldwide. This requires distribution techniques that keep the information synchronous with the least possible latency. Storage providers are best equipped to meet this challenge, says Arbitter: “The first truly global solution won’t be ready for the market before the end of 2009. At this time, most providers work with systems they cobbled together themselves, or the data is only stored regionally.” In addition, current broadband access speeds are still too slow to guarantee a high level of service quality.

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While technical advances will resolve these problems over the short term, integrating the increasingly heterogeneous IT landscape poses a serious problem for the providers. For marketing reasons, most of today's cloud solutions are still proprietary and don't have any standardized interfaces. As a result, there is no guaranteed interoperability between the various clouds or with existing systems. "In recent years, the providers have focused more and more on end-to-end integration to deliver faster processes as well as more productivity and transparency. Today's demand for best-of-breed solutions, however, tends to favor silo structures that ultimately have to be integrated again," says the expert.

Many operating systems and applications, however, are not 'cloud-compatible', which makes integrating the user IT difficult. Since standard adapters work only in very few cases, there is a definite need for customized solutions and competent system integrators. "This is where IT service providers like Siemens IT Solutions and Services can deliver, because they can not only operate these so-called hybrid models, but provide support for the systems' transformation and integration," says Arbitter.

Three approaches to comprehensive service

Siemens is one of a few providers that cover the entire spectrum from software as a service (SaaS) to infrastructure as a service (IaaS) to platform as a service (PaaS). And since Siemens works with many different vendors, it is always able to deliver the solution that works best for the customer.

Software as a service:

At first glance, software as a service is the same as the older application service providing approach. The difference, however, is the fact that the highly standardized applications can be used by many different customers simultaneously over the Internet. The service's client capability is a critical feature. SaaS is not only very affordable and flexible, but all users benefit equally from software advances. In addition, the providers can install upgrades in the background with very little effort. The users can decide themselves whether they want to use the new releases (possibly with new features) or keep accessing the old ones.

"Siemens IT Solutions and Services offers its own as well as its partners' software as a service. The former ranges from document management to a project server. In addition, we are currently looking into several other promising applications which we may offer our customers as a service," explains Arbitter.

Infrastructure as a service:

IaaS is the logical further development of a physical managed server into a virtual managed server. Via portal, clients are able to buy additional computing performance, storage or archiving space within minutes. Even during load peaks, the network of systems ensures a high level of availability. This service is very attractive for digitizing documents such as patient files and X-rays in the healthcare field.

Another benefit for the user: Computing and storage services can be flexibly adapted to dynamically changing requirements. This eliminates the need for contractually stipulated business forecasts and ties to a single provider that are part of classic outsourcing

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schemes. In accordance with the on-demand model, users can cancel services they no longer need at any time.

“I believe that at some time in the future, computing power will come like electricity out of the wall socket. This new level flexibility and the accompanying improvements in system utilization will help to realize the kind of sustainable IT everyone is striving for,” says Arbitter.

Platform as a service

PaaS goes beyond IaaS by additionally including an operating system and other development tools in the cloud. These tools can be used to develop new applications or adapt existing ones to run on the cloud-based platform. The customer creates and maintains the application while the PaaS provider supplies the platform and may also handle the billing processes for the customer and his applications.

The cloud computing uses the following example to explain how it works: “A software developer writes an innovative program – possibly by using cloud-based computing performance – to sell a service on the Internet. When the program is complete, it takes only a few clicks to run it from anywhere in the world. The developer does not need his own server, nor does he have to worry about configuring the web service. When sales come in, the PaaS provider handles the entire billing process and transfers the income to the developer at the end of each month. The developer does not have to take care of anything.”

This model is particularly attractive for small and medium-sized companies, because they usually don't have the necessary server structures and development platforms. It is also of great interest for companies in very innovative fields, for example in the media industry, because it enables them to provide their customers with a flexible web platform on which they in turn can post their own content.

“These approaches are still in their infancy,” says Arbitter. “Over the intermediate term, the goal is to set up the platforms and the corresponding tools in such a way that hybrid models become possible as well. This means that the application runs at the customer's or his hosting company's data center while accessing suitable services from a cloud computing provider.”

Homework for cloud computing providers

The experts agree that cloud computing will change the IT market. Some market observers even predict that long-term outsourcing contracts will become obsolete. Instead, the business will be increasingly characterized by rapid turnover. The maximum cancellation period for private clouds is already as short as one month. But not all questions have been answered at this point. In addition to data protection aspects and the frequently insufficient quality of service, these are often concerned with the protection of the users themselves.

Since too many factors are beyond their influence, many of today's providers are unable to deliver on the basis of specific service level agreements (SLAs). They may give discounts or credits, which is sufficient for most private users, but that doesn't help a commercial user whose production may come to a screeching halt because of a system failure in the 'cloud'. Unlike traditional outsourcing deals with their systems of bonuses

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and penalties, the cloud infrastructure provider cannot be held liable for the resulting damages. Since the immaturity of SLAs in the cloud computing field still causes many potential users to be skeptical of the service, many providers are working on developing uniform standards.

Interview with Peter Arbitter, Chief Technology Officer at Siemens IT Solutions and Services:

What impact will the spread of cloud computing have on classic outsourcing, the core business of Siemens IT Solutions and Services?

Answer: The classic outsourcing business will definitely change. For sensitive data and highly complex systems, traditional data centers will continue to be in demand. But running such solutions will be more expensive and less flexible than cloud computing services. For commodity applications, on the other hand, there will be highly standardized service offerings that will be cheaper and more flexible than what we are used to today. And since more and more customers bank on multi-sourcing, the IT world will become even more complex.

In recent years, the main IT buzzwords were harmonization, consistency and standardization. Won't cloud computing reverse this trend?

Answer: Yes, it will. Today, many providers try to attract customers with very low prices for standalone solutions. If companies pick the cheapest solution for each application, they will inevitably wind up with silo structures and complex IT landscapes, because standardized adapters are often lacking. And this will consequently harm the integration of the workflow processes and their consistency. For example, an e-mail program may no longer be linkable with the CRM system. That's why it is so important to get the system integration and the service desk from a single source.

How does Siemens IT Solutions and Services position itself with respect to the new trend toward cloud computing?

Answer: We offer our customers wide-ranging cloud computing services that focus on the areas of software as a service, infrastructure as a service and platform as a service. As a system integrator and provider of services, who works with the most important partners in the field, we are not tied to any particular technology or platform. We pool the manufacturers' offerings with additional services such as integration, migration, application management, service desk and service integration. That way we are able to combine the classic IT world with the new world of cloud computing. This means that, depending on the requirements, applications use customer resources as well as cloud-based services. This is important, since virtually no company will operate its entire IT in the cloud. At this time, we are involved in active discussions regarding this new approach with our strategic partners as well as with our customers.

What makes cloud computing services from Siemens special?

Answer: Since we target business users exclusively, we give security and integration top priority. For example, we don't offer any giant public clouds, only dedicated private clouds where the customer knows at all times where his data is being stored and where Siemens is his single point of contact. The applications can also run on the customer's hardware and be administered by us.

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How secure is private cloud computing really?

Answer: If you use all security-relevant features of cloud technology, such as encryption, private cloud computing is no different from classic outsourcing as far as data protection is concerned, because in both cases the service provider operates the hardware. And this is something in which we have decades of experience. For example, we were the first company in Germany that provided outsourcing services for an insurance company. And the insurance industry is particularly sensitive as far as data security is concerned.

What data or applications are suitable for cloud computing?

Answer: Most business data transactions are potentially suitable for cloud computing since they don't need to meet top-security requirements. If an application doesn't require special versions or features, i.e. if normal standards are sufficient, cloud computing offers tremendous benefits. Prime examples include e-mail or collaboration services. Having a large group of users is also an important criterion. In short: Standard mass business involving data with normal security requirements can be implemented much more quickly and cost-effectively in the cloud.



Peter Arbitter, Chief Technology Officer at Siemens IT Solutions and Services. (Source: Siemens IT Solutions and Services)