Reasons for „Going to the Cloud”

This report should cover reasons for going to the cloud. The first question is about the top five reasons for “going to the cloud” in my opinion. After that elastic scale is getting defined in a different way before the usability of a cloud solution will be discussed. The last question to be answered is the security factor. The biggest concern people have about “going to the cloud” is the security factor. But is this a reasonable concern?

1. My top five for “going to the cloud”

- Resource Utilization:  
Due to the virtualization cloud providers use, the single physical servers of their server farm are likely to be utilized as much as possible. Therefore, the server components get used to a maximum such that no resource gets wasted and stays idle for no reason. This is helpful as today’s internet usage grows steadily and therefore more servers are needed. Using all the resources of the servers available help in such a way that less servers are needed and resources can be saved. This is also cost effective such that companies can save a lot of money using cloud computing.

- Capacity:  
Capacity is one of the major points for going to the cloud. Cloud providers own a lot of physical servers that can all be utilized to the maximum. If a companies server need grows, they normally have to install new servers which takes a lot of time and therefore should be done well in advance such that they can be utilized the second they are needed. Also due to the peaks that normally can happen to a website, companies should have additional resources that can handle this additional rush without breaking down the service. This is normally a huge cost factor of a company. Using the cloud however the company can utilize as many resources as needed and have only to pay for the resources they were really using. This ensure that the company can react to changes in usage faster and overall save a lot of money.

- Maturity:  
Cloud Providers are like specialists in their field and therefore they have likely the most knowledge of how to set up, utilize and maintain servers. A normal company who wants to set up a server needs someone with knowledge of how to do so and how to use and maintain it. It is still helpful for a company to have such a worker inside the company such that he can work together with the cloud provider and ensure that the servers rented work as expected but the company needs less of these as most of the work is being done by the cloud provider. Their specialized team is located around the world such that they can handle and solve problems very fast at any time.

-Availability:  
This also leads us directly to the next reason, availability. Availability means that they have specialists all over the world to ensure that the server is running and also that should a virtual server break down that is not that uncommon can react to that fast as they directly set up a new virtual one such that the off time of the application someone is running on the cloud has as little downtime as possible. This is very important as every minute in downtime can reduce the revenue of a company. Because of that many companies have duplicated servers running all the time such that downtimes of some can be handled by others while the crashed one starts up again. This indirectly also describes fault tolerance and recoverability. Because of that I don’t mention these two here, although I think that they are also major points for going to the cloud.

- Confidentiality:  
As a further reason for going to the cloud I take confidentiality. Overall, I could have said security as a whole, but as this is divided in the list, we got I took one of them, that also covers all other security parts in my opinion. A lot of people think that the cloud is not secure, even though the cloud is probably more secure than any server your company could set up. The cloud provider has many security specialists employed that ensure that the data is saved at a secure place and the application runs secure without any inference to other applications. Every virtual server is like an own separate server that has nothing in common with the other virtual ones running on the same physical server. The data and applications are like in their own environment only the company that owns it can access. Even the cloud provider itself is not able to access or interact with the data. Whenever a virtual server or data base is shut down the whole memory it used is getting zeroed. That means that it is not possible to get access to the data saved there anymore. Because of this it should be clear that a server in the cloud is save. As the cloud provider as said before has a huge amount of specialists employed it is also likely that their server is more secure than the server your company can ever setup.

All of these points cover a variety of points why going to the cloud. There are of course more but they are the five most important reasons to go in my opinion. One of the points, capacity, also covered the scaling principle of the cloud which means that a company can utilize the amount of resources they really need at any time and only to pay for the amount they used. Now we want to talk about what scale really means in the context of cloud computing.  
Elastic scale and scale in general is one of the five principles of cloud computing that ensures that a company can use the right amount of resources they really need. A companies application has a base usage that it needs most of the time. The usage can however vary strongly during a day. During the night an application is normally not used a lot and therefore less resources are needed to provide the application. In the morning the usage normally grows over the day and in the afternoon, noon the usage peaks. The later it gets, the usage gets less again until it is at a minimum during the night again. Depending on the application the usage varies. Let us assume our application is Netflix. During the night, the usage should be at the minimum over the whole day. In the morning, as people wake up the usage grows until people have to go to school or work. During school and work hours, Netflix normally has a low usage. As soon as the school finishes the usage grows and after people come home from work it grows even more. In the afternoon/noon hours the usage is at is maximum before it gets lower in the night again. On weekends the usage is different, but we only consider weekdays for now. Therefore, it should be clear that the server capacities needed to provide the service depend on the time of the day. In the night less resources are needed than in the afternoon/noon. This leads to the fact, that the cloud could help here to provide the right amount of resources needed over the day. If Netflix uses the cloud for its application, it needs less servers as it can adjust to the usage within minutes and also only pay for the resources it utilizes which makes a huge difference in a company that big. The cloud also helps at peaks. Netflix has peaks whenever a new movie or series gets released a lot of people are waiting for. In the hours or even days after release more users than normally want to watch it at the same time. Therefore, they need more resources to handle the rush. After a few days however, when most people have finished the new series, the usage gets back to the base usage and therefore less resources are needed. Should Netflix now however has bought resources to handle this rush, the resources are idle and make no revenue. So, it would be smarter to have used the cloud so that the short rush could be handled by their server capacity. Then the users also would have been satisfied as the service didn’t break down and the company would also be happy as they had to spend less money to handle the rush. This example should have demonstrated why going to the cloud can be important and what elastic scale means. Scale describes accordingly that the cloud provider is always able to provide exactly the resources that the company needs. It can adapt and provide the resources to the requirements of the customer at any time.

This example could also directly be used to describe in what way a cloud solution can address usability. As with using the cloud the company can utilize the amount of resources that are needed to provide their application or service, it is very unlikely that the user cant access the service/application whenever he wants. The elastic scale principle of the cloud is used to provide the resources needed or requested by a company. If the resources needed are available, the user is satisfied as he can use the service in the way he wants and doesn’t look at an error page of a failing request. As described in the part above the company can request as many resources as needed from the cloud provider to handle all the requests it gets to its service. As long as the company requests enough resources, the service is able to handle the number of requests it gets and therefore can satisfy users. Should the company however use its own servers it can happen that some usage peaks occur that can’t be handled by the servers it owns and therefore break the service. The cloud however, which has an enormous number of resources available is able to handle also these peaks. This describes with the part above together that the cloud is useful in order to address and maintain the usability of a service.

The last part we want to discuss in this is security. As mentioned and described above the biggest concern people have for going to the cloud is security. This concern however is unnecessary as cloud providers have a huge number of security specialists employed that take care about the servers. If these people can’t protect data and a service who else can. They have a lot of different physical security measurements before an employee can even get into a server farm and work at it directly. Only the company itself has access to the data and applications running on the cloud. Whoever wants to access it has to double authorize and therefore can’t easily get access easily. If a memory space is not used by the company anymore it also gets zeroed such that no one can access the data that was previously saved there. If you think that this is still not safe enough you can also encrypt the saved data, such that it is even harder to get access to it. So overall the cloud provider really take care about the security parts. They ensure that only the people who should have access to the service and data who should have access to it. In my opinion the cloud is a very secure place and not many companies can secure their data in a better way.