Are we in a cloud again?

In autumn 2009 Obama's administration announced a far-reaching cloud computing initiative. The idea is to cut down on the uncontrolled construction of data centers, reducing investments in infrastructure as well as the energy spent by the government on information and communications technologies. The goal is to transfer the majority of the government's information systems into using cloud computing.

According to some sources, in 2009 cloud computing represented a business area of the size of Nokia Corporation. It is predicted that cloud computing business operations will triple by 2013.

In Finland the public sector seems to be awakening to the idea that servers placed in the corners of administrative offices could be made redundant by transferring the applications they host to a cloud. And the same could be done for the applications on desktop computers. This would simplify software maintenance. Especially the municipal sector suffers from their information systems being so scattered. Information does not flow between offices or between municipalities. This is a natural consequence when each municipality or group of municipalities makes its own decisions regarding acquisitions of information systems. Centralizing the existing applications or, in other words, placing them in a cloud could perhaps solve the problem. Then we should centralize the processes of choosing the technology, deciding on acquisitions, and maintaining software. On this basis it might be possible to attain better conformity concerning IT solutions and to achieve easy information flow between different administrative offices, from the government to municipalities, from a municipality to the appropriate group of municipalities and to the government, and from one application to another. This would enable significant benefits in terms of productivity in the public sector. Thinking of the sustainability of investments and availability of labor in the public sector, this has a high potential importance.

Thinking from a broader perspective, customers who utilize cloud computing more extensively can be divided into companies, the public sector, and consumers. Cloud computing seems to offer clear benefits both for companies and the public sector. A group of companies led by Finnet has reported on a far-reaching SuperMatrix project that aims to provide domestic computers with all programs and the related security needed by consumers from a cloud. Success in this will certainly not depend purely on reason. It is also a question of trust, which is partly irrational. We want to own our own devices. We might well drive around using rental cars. For some reason we usually do not, and we want to own the car and better still, we want it to be one that pleases us more than our neighbor's car. Some users want to use their computer to do things that are somewhat shady. But this is difficult for a cloud operator to accept, for it might rapidly develop into lawsuits, with substantial claims for refunds raised against the operator for, for example, illegal copying by the consumers. Even if we do not wish to get involved in this type of gray activity, we might, however, consider it best to do things on our own. On the other hand, cloud computing provides consumers with hope in that it will not be necessary for every family to have their own IT support person to solve computer problems. Hence success is difficult to predict in the consumer segment.

The production machinery of cloud computing is placed in data centers. They are well protected, often large halls placed underground, with tens of thousands of computers. There are several tens of companies in the world that have one or more data center with more than 50,000 servers. The largest ones compete with each other over millions of servers. According to certain sources, data centers connected to the Internet consume more than 2 percent of the world's electricity and the consumption will quadruple over the next ten years. Part of this energy is used by computers that turn it to heat. Cooling is another

important energy consumer. The availability, price and quality of electricity seem to play a key role, when data centers locations are chosen. When Google brought one of its data centers to Finland, we realized that Finland is, indeed, a good place for data centers: electricity is cheap and easily available, and cooling energy is cost-free for most of the year. Additionally, "green energy" is easily available. Many other international data center corporations have been interested in investing and placing their facilities in Finland. Many of these decisions have not been made. What factors have slowed down these decisions? Apparently, according to these corporations, Finland lacks the basic skills needed for building large data centers, and operators are not interested in installing fibers to some rusty old industrial hall hiding asleep next to an old watermill, etc. The complaint about the lack of skills falls into academia's court and, at the very least, touches electronics and energy technology, construction technology, information technology, EMC issues, and data communication. At universities we should see this as an opportunity and grab it. We could also see which part of our own data processing could be transferred to a cloud. As in all academic information technology, in this context, key criteria of choice is quality and not the price of the service.

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