

2 Cloud Computing – improving efficiency and reducing costs

In the Autumn 2009 issue of the magazine we talked about the Google Chrome operating system. Together with the Android operating system (*see the next article*) they are designed to support the increasingly popular concept of Cloud Computing. Like many other things in the world this is driven by requirements to improve efficiency and at the same time reduce costs. Instead of building infrastructures, purchasing, installing, maintaining and troubleshooting different software tools, companies are able to use other companies' infrastructure

and tools located somewhere in the 'cloud'. There is no doubt that cloud computing is going to be used in the electric power industry in different forms. In order to understand what the Information Technology (IT) people are talking about, we need to at least have an idea what it is and what is the meaning of the different acronyms being used to describe the components of a cloud computing based system. Similar to Smart Grid, Cloud computing involves a range of technologies and usually means different things to different people. There are many

definitions of cloud computing that can be summarized as follows: A distributed method of performing different computational or data processing tasks over the Internet using third party infrastructure and software tools. The following are some of the more common abbreviations used in cloud computing: A cloud provider is a company that creates an environment providing storage, software and other resources that can be used by customers over the Internet. Clouds can be:

- Private Cloud – it is setup by the company as a cloud-like IT environment for internal use by the company
- Public Cloud – it is setup by a company for use by multiple external users
- External Cloud – similar to the Public cloud, but use is limited to one or two external users
- Hybrid Cloud – IT environment that uses both Public and Private clouds
- Virtual Private Cloud – similar to Virtual Private Networks (VPN), VPC creates a secure private cloud within a public cloud

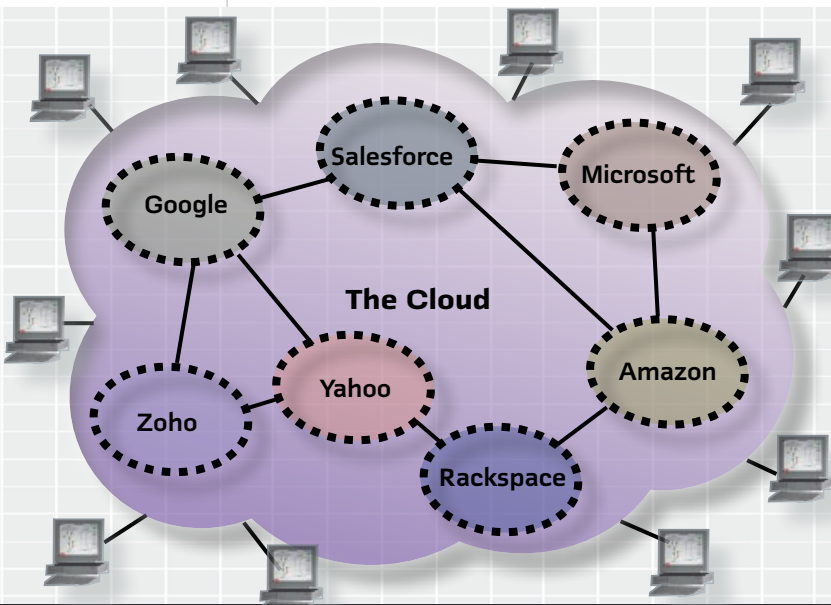
The cloud can be used for

All computing is done in the Cloud.

The future of computing.

many different purposes, depending on the needs of the user. That is why different services are available separately or combined:

- Infrastructure as a Service (IaaS) – a provider of this service allows other companies to use its infrastructure. HaaS (Hardware as a Service) is a version of IaaS, limited to the use of necessary hardware.
- Software as a Service (SaaS) – an application delivered over the Internet. In this case a vendor hosts the software on its own servers and sells licenses to the users.
- Platform as a Service (PaaS) – offers a platform on which to build applications, allowing that develop software to create SaaS applications. ■



A set of very useful articles on cloud computing is available in the December 09 issue of PCToday magazine at :

<http://www.pctoday.com/>

3 Android

Mobile operating system by GOOGLE

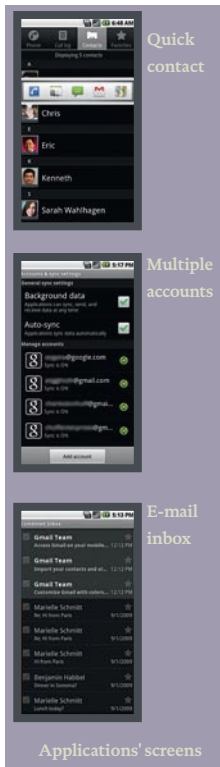
Android is another operating system developed by Google to enable software developers to create applications that take full advantage of the capabilities of different mobile devices. It is built on the open Linux Kernel and utilizes a custom virtual machine that was designed to optimize memory and hardware resources in a mobile environment. Android is a true open source that can be extended to incorporate new cutting edge technologies when they become available.

Android does not differentiate between the device's core applications and third-party applications. They can all be built to have equal access to a phone's capabilities providing users with a broad spectrum of applications and services. With devices built on the Android Platform, users are able to fully adapt the phone to their needs. They can customize its appearance and behavior and select which applications will be used to perform specific tasks.

Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. For example, Android enables developers to obtain the location of the device, and allows devices to communicate with one another enabling rich peer-to-peer social or other applications. In addition, Android includes a full set of tools that have been built from the ground up alongside the platform, providing developers with high productivity and deep insight into their applications.



Android symbol



Applications' screens

The Android platform consists of several projects already in progress which can be divided into three categories:

- **Core projects:** These projects make up the foundation of the Android platform
- **External projects:** The Android Open Source Project makes use of many other open source projects
- **Packages:** These projects are standard Android applications and services

The Android SDK has the tools, sample code, and documents developers need to create applications. It can be downloaded from <http://www.android.com/>

Cupcake logo



Nexus One

At <http://www.android.com> website you can also find information about Android and Nexus One – the first Android device from Google.