

Africa Can Greatly Benefit from Cloud Computing and Data Center Technologies – Part 1

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"Africa is virgin land, and they are adapting fast to new technologies and that is why we want to be there." Alexander Argov, Tikal's founder and CEO [Silverstein].

INTRODUCTION

Africa has made tremendous progress in the technology catch-up game in the last ten years. As I have been saying in my editorials in the last few issues of this journal, Africa was a late comer on the technological scene that has swept the rest of the world. However, because of the exuberance of her youth in embracing technology, the continent is making tremendous strides.

In this spirit I want to offer a few suggestions, as it concerns Africans, in which Africa can derive tremendous advantages and benefits in her development and technological trajectory, in the new technologies that are sweeping the rest of the world. These technologies are: Virtualization resulting in Cloud computing and Data Centers. In this part I of the article, I will focus on Cloud computing technologies and in part II I will deal with Data Centers.

According to Wikipedia (WIKIPEDIA), **Cloud computing** refers to the use and access of multiple server-based computational resources via a digital network like a Wide Area Network (WAN), Internet connection using the World Wide Web and others. This is in reality not a new technology as such. Indeed it is a revisit of an old technology developed during the days of the virtualization of operating system resources, services and technologies of the 1970s and 1980s. Back then, the technology part of time and resource-sharing where computing resources of the time residing on one mainframe were shared by hundreds of users from far of places connected to the mainframe using dump terminals. The mainframe was acting as a server, but it was not called a server. In today's environment, we have new terminologies and a new expended repertoire of computing services that almost make the environment new to the old timers and of course new to all the new brands of technology buffs.

Unlike in the old technologies of operating system resources virtualization where users accessed computing services from the mainframe using only dump terminals, today's Cloud users remotely access the server resources using a

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variety of devices including computers, netbooks, ipads, smart phones, or many other communication devices. And also different in the mainframe days gone by, but offered in cloud computing, is a large spectrum of computing services and applications provided and managed by the cloud server. In some cases, also data is stored remotely in the cloud configuration. However, similar to the computing of days gone by, in the Cloud, users do not download and install applications on their own device or computer; all processing and storage is maintained by the cloud server. The on-line services may be offered from a *cloud provider* like IBM, Microsoft and many others or by a private organization.

Like its cousin mainframe in the past, Cloud computing offers the users a model of computation that enables and creates a convenient, on-demand network access to a shared pool of configurable and expansive computing resources and services that are scalable, versatile and seemingly limitless to the users with minimal management effort or service provider interaction.

Africa with her computing environment and resources still in its infancy and with serious limited computing human capacity, modern computing equipment, services and management, but with expanding demand for human capacity in all areas, better computing equipment, faster computing environments and services and limited financial and human management resources may greatly benefit from this convenient, on-demand network access to a shared pool of configurable, expansive computing resources and services that are scalable versatile and seemingly limitless to the users with minimal management effort or service provider interaction provided by the Cloud.

Every aspect of the African institution and organization is bound to gain from Cloud computing. In particular, African institutions starting with governments, universities, both private and public organizations can benefit from the following list of services, resources and computing facilities that they would otherwise not have.

The following is a list of benefits Cloud computing technology offers to any computing environment makes a compelling case for African governments and institutions, if not already considering the technology, to start seriously thing about it [Wikipedia]:

- **Cost** – perhaps this is the most important of all Cloud benefits because of the limited African financial resources pool. For example one Cloud computing server can be used by the regional or country's universities all seamlessly sharing the needed resources. For businesses, this lowers the computing costs because the computing infrastructure is typically provided by a third-party and does not need to be purchased for one-time or infrequent intensive computing tasks. Because this is a shared pool of resources, pricing on a per unit utility computing is low hence requiring fewer and limited in-house IT skills for implementation.
- **Device and location independence** – This plays in the hands of developmentists who can now bring computing services and enable users in remote, difficult to access areas to access systems using a web browser regardless of their location or what device they are using for example a, PC, mobile phone or any other smart communication device.
- **Multi-tenancy** – the ability of the Cloud technology to enable sharing of resources nationally and regionally and allowing large pools of users to share these resources lowers the costs of shared computing for everyone thus allowing for better services for everyone.
- **Reliability** – because of the varying demands from users and to meet the expectations of users, Cloud technology brings into play more reliability through use of multiple redundant sites which in turn brings more confidence to the business community, improving the business environment and eventually attracting more foreign businesses into the region.
- **Performance** – along with improvement in reliability, performance improves and with improving performance, more demand and more improvement in performance leading to scalability to meet different customer needs.
- **Security** – to meet the expectation of the different categories of users, improved security is a must because of the centralization of data. So increased security-focused resources and operations, more and better trained personnel is a must.

- **Maintenance** – because computing resources are centralized, cloud computing applications and resources are easier to maintain. They are also easier to support and to improve, as the changes reach the clients instantly.

With all the benefits outlined above and a lot more not discussed here, the Cloud computing technology is probably one of the most suited new (but old) technology for Africa. It will tremendously improve the return on investment, create the needed computing and management human capacity and improve the business community confidence in the continent leading to new investments, new education opportunities and overall improvement in the individual welfare of the Africans themselves. This is a timey technology. Embrace it with hast!

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