## GigaOM Structure 09: Put Cloud Computing to Work University of California, San Francisco—Mission Bay San Francisco, CA Thursday, June 25, 2009

In a cloud computing environment, traditional databases are passé, the IT world is moving to dataspaces where massive web-scale computing is creating a physically distributed infrastructure, leading to the emergence of distributed data storage and processing layers such as <u>Hadoop</u>, <u>HyperTable</u>, and <u>Couchdb</u>. These new paradigms will force IT to rethink their current practices, but they'll also offer many benefits and opportunities. Facebook, for instance, had to scale in many different directions and has about 50 TB of

storage. The largest database Yahoo! used was 16 TB. There are two types of storage systems DHT — <u>distributed hash table</u> — and sorted structure — <u>Bigtable</u>. These systems are massively scalable to over 1,000 machines.

The idea of owning servers still makes sense; however, you shouldn't, unless you want to customize them. Oracle CEO Larry Ellison said SaaS is not the cloud. We are not sure what he meant and also believe Larry has often been misquoted and don't think he is against CC





per se. In fact, at another conference on SaaS earlier this year, an Oracle VP (and a Sun alumnus) said he believed there is room for CC in IT, but it will neither take over IT

completely nor meet all of IT needs, and some applications will never move to the cloud. This is what we wrote in a blog over a year ago.<sup>1</sup> Any technology that will be commoditized will move to the cloud. With cloud computing you don't need specialists running around in your IT shop helping end users: Every engineer in WordPress is reportedly a Sys Admin and a DBA. The future belongs to solid state devices and programming languages and frameworks that will help develop apps faster, e. g., Ruby on Rails.

Akamai is a classic example of cloud computing, claimed its CEO, Paul Sagan, a cousin of the late, beloved Carl Sagan. Akamai has been in the cloud for over 11 years; it gets 300 billion requests per day. Cloud is virtualized, on-demand infrastructure with the following attributes:

- Access via the Internet
- Outsourced, shared infrastructure
- Scalable resources that you get on demand
- Metered use
- Reporting, insight, and security

Cloud computing, claimed Paul, is inevitable because of the acceptance of web-enabled technologies, security improvements, greater efficiency, and 'Being Green', since IT is the biggest sinner in carbon footprint. However, the culprit in the cloud is the middle mile.

In the long run, will there be one huge cloud vendor or many vendors? If you look at any industry, usually the top three geographies/vendors dominate. For instance, in the auto industry three geos mattered — the U. S. (that is before Detroit started dying or committing suicide), Germany, and Japan. In consumer goods it is Proctor & Gamble, Unilever, and Nestlé. In car rentals in the U. S. it is Enterprise, Hertz, and Avis. So, will a few major players dominate the CC scenario? Google, Amazon EC2, HP, IBM, and Microsoft definitely cross our minds. Oracle/Sun and SAP are wildcards. These players could offer specialty clouds with industry-specific services, such as HPC, GRC (governance, risk management, and compliance), and security.

The notion that everything will move to the cloud is cloud-washing. It's akin to saying we all will move to rented apartments, use only rental cars, buy junk food everyday, and have absolutely no infrastructure that

we own! Some applications, such as crucial data close to your heart, will never go to the cloud. Enterprises are cautious about migrating their most-demanding applications to public clouds. Public cloud infrastructure can't run all existing enterprise applications, especially the most mission critical, without some modification and more advanced management software. One cloud doesn't fit all; at the same time, Balkanization of the cloud is not good.

Because of IT's concerns about security and control, one solution could be to build your own cloud with your existing infrastructure investment as a first step. The issue of trust is of utmost importance in the cloud; next are agility, space, and performance. Extending Nicolas Carr's arguments in his book <u>*The Big Switch*</u>, if we all use clouds, what will be our differentiators? Guaranteed QoS and SLAs, better customer support, ease of use, effortless integration...?

Finally, we have a few concerns about CC.

First, does CC result in vendor lock-in? In other words, today one may be using Amazon EC2, tomorrow one may be dissatisfied and want to switch to, say, Google. What effort is required? Is it like being tied to a clueless, worthless, wireless carrier in the U. S. on a two-year contract? Beyond contractual obligations, how technically feasible is it? What about APIs? Can we see on the horizon a set of 'CC APIs' that will help end users dump one CC vendor and switch to another one?

Second, as we are building huge CC cities and suburbs, are we overlooking the already-clogged broadband highways among them? As data center networking speeds start to exceed 40 Gbps and eventually reach 100 Gbps, the pipes that connect those clouds to the outside world and each other could choke, burst, and hit their limits, just as our highways are. Yet, we in the U. S., unlike our smarter citizenry across the pond, keep adding more lanes to our highways, instead of building mass transit!

Third, as an entrepreneur heading a startup, one may want to know how big the CC market is. Gartner was quoted in a recent *BusinessWeek* article predicting the market for cloud products and services to grow from \$46.4 billion in 2008 (don't ask me how they got that figure) to \$150.1 billion in 2013. I'd take any analyst prediction with a grain of salt. If you recall, the late 1990s were the hype period for Service Providers (SPs) —



ASP, ISP, MSP, XSP...In fact, one well-known industry research firm predicted in 1998 that the ASP market would grow to \$28 billion by 2003. The actual market that year was \$7 billion!

So, don't let the clouds blur your vision. Clouds, too, diffuse and pass. Above the clouds is a clear blue sky and below is crystal-clear blue water! Enjoy them both!!