

The Cloud Is The Computer

“You don’t generate your own electricity. Why generate your own computing?”

—Jeff Bezos, CEO, Amazon

IN THE early 1990s, Sun Microsystems launched a new marketing campaign with a singularly perplexing slogan: “The network is the computer.” What on earth did that mean? I knew about networks, of course, having worked in a Macintosh shop, but the wires between our computers were primarily for sending e-mail. My computer was my computer. After I became a freelance writer in 1991, my network was whatever floppy disk I had at hand (the infamous “sneakernet” solution). My computer was still my computer. Even after I cobbled together my first 10Base-T network, in 1993, the only consequence was that I used floppy disks less. My computer stayed resolutely in front of me, and I’m sure this was the case for most folks back then.

In the past few years we’ve seen Sun’s slogan morph from perplexing to prophetic. As we do more and more online, we see that the network—that is, the Internet—is now an extension of our computers, to say the least. Particularly with wireless technologies, we see that a big chunk of our computing lives now sits out there in that haze of data and connections known as the **cloud**. In fact, we’re on the verge of **cloud computing**, in which not just our data but even our software resides

within the cloud, and we access everything not only through our PCs but also **cloud-friendly** devices, such as smart phones, PDAs, computing appliances, gaming consoles, even cars.

It’s the dawn of the age of **pervasive computing**, when computation and information are ubiquitous and always available. It will be the age when the World Wide Web becomes the **World Wide Computer**, or simply (albeit ominously) the **megacomputer**.

The cloud is a powerful computer not only because so many of us now connect to it but also because many companies are spending billions to bulk it up. The basic unit of the new infrastructure is the **data center**, a typically massive building (think multiple football fields in size) housing enormous **clusters**, collections of computers (usually numbering in the thousands), networked together to power the online services we’ve come to rely on: Google’s search engine, Amazon’s e-commerce operations, YouTube videos, and so on. The stupendous size of these **server farms** is one reason even the most complex Google search yields results in a split second, and why even the longest YouTube video starts within seconds.

But the cloud doesn’t exist just so you and I can get



speedy search results and videos. It also offers companies more computer power. This began with Amazon’s S3 (Simple Storage Service), which offered companies storage space on Amazon’s thousands of servers for a fraction of the cost of purchasing physical hard drives. Now with EC2 (Elastic Compute Cloud), Amazon is letting companies use the spare cycles on Amazon’s servers. (The virtual world of Second Life is generated by Amazon computers.)

This trend is called **hardware as a service** or simply **virtualization** because it offers companies the use of virtual computing equipment. A similar idea is **software as a service**, which gives companies access to virtual software packages such as payroll, accounting, and customer-relationship management. Both **HaaS** and **SaaS** let companies reduce their IT budgets by ordering only as much **computing on demand** as they need.

In his fascinating recent book *The Big Switch: Rewiring the World From Edison to*

Google, which discusses the coming shift to cloud computing, Nicholas Carr points out that the cloud is rapidly becoming analogous to the electric grid: in the same way you can just plug a device into a wall socket and get electricity cheaply and instantly, you can now plug into the cloud and get data, storage space, and even processing power cheaply and instantly. This is **utility computing** powered by massive **utility data centers**—the cloud equivalents of power plants.

Those of us who’ve been around long enough to recall an analog-only world may resist this new age, but not so the **digital natives**, who are growing up in a world filled with computers, mobile phones, and other digital devices. **Digital nativism** is the belief that these **screenagers** have a major advantage over the rest of us, not only in using these new-fangled gadgets but also in the increased cognitive skills that using those devices allegedly confers. Is that true? I don’t know, but I bet the cloud does. □