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Active in Cloud, Amazon Reshapes Computing

By **QUENTIN HARDY**

SEATTLE — Within a few years, [Amazon.com](#)'s creative destruction of both traditional book publishing and retailing may be footnotes to the company's larger and more secretive goal: giving anyone on the planet access to an almost unimaginable amount of computing power.

Every day, a start-up called the [Climate Corporation](#) performs over 10,000 simulations of the next two years' weather for more than one million locations in the United States. It then combines that with data on root structure and soil porosity to write crop insurance for thousands of farmers.

Another start-up, called [Cue](#), scans up to 500 million e-mails, Facebook updates and corporate documents to create a service that can outline the biography of a given person you meet, warn you to be home to receive a package or text a lunch guest that you are running late.

Each of these start-ups carries out computing tasks that a decade ago would have been impossible without a major investment in computers. Both of these companies, however, own little besides a few desktop computers. They and thousands of other companies now rent data storage and computer server time from Amazon, through its [Amazon Web Services division](#), for what they say is a fraction of the cost of owning and running their own computers.

"I have 10 engineers, but without A.W.S. I guarantee I'd need 60," said Daniel Gross, Cue's 20-year-old co-founder. "It just gets cheaper, and cheaper, and cheaper." He figures Cue spends something under \$100,000 a month with Amazon but would spend "probably \$2 million to do it ourselves, without the speed and flexibility."

He conceded that "I don't even know what the ballpark number for a server is — for me, it would be like knowing what the price of a sword is."

Cloud computing has been around for years, but it is now powering all kinds of new businesses around the globe, quickly and with less capital.

[Instagram](#), a 12-person photo-sharing company that was sold to Facebook for an estimated \$1

billion just 19 months after it opened, skipped the expenses and bother of setting up its own computer servers.

EdX, a global online education program from the Massachusetts Institute of Technology and Harvard, had over 120,000 students taking a single class together on A.W.S. Over 185 United States government agencies run some part of their services on A.W.S. Millions in Africa shop for cars online, using cheap smartphones connected to A.W.S. servers in California and Ireland.



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“We are on a shift that is as momentous and as fundamental as the shift to the cloud,” said Andrew R. Jassy, the head of A.W.S. “It’s happening a lot faster than any of us thought.”

He started A.W.S. in 2006 with about three dozen employees. Amazon won’t say how many people now work at A.W.S., but the company’s Web site currently lists over 600 job openings.

Amazon’s efforts are just the start of a global competition among computing giants. In June, Google fully introduced a service similar to A.W.S. Microsoft is also in the business with its offering, [Windows Azure](#).

If only for competitive reasons, Amazon does not say much about A.W.S. However, it is estimated to bring in about \$1 billion to Amazon. Its three giant computer regional centers in the United States, in Virginia, Oregon and California, each consist of multiple buildings with thousands of servers.

There are others in Japan, Ireland, Singapore and Brazil. And the pace of its expansion has quickened. It opened four of those regions in 2011 and is believed to be building a similar number now. Jeff Bezos, the chief executive of Amazon, is interested in setting up cloud-computing installations for other governments.

According to an executive with knowledge of Amazon’s operation who was not authorized to speak publicly, just one of the 10 data centers in Amazon’s Eastern United States region has more servers dedicated to cloud computing than does Rackspace, a public cloud company serving 180,000 businesses with more than 80,000 servers.

Eventually, however, Mr. Jassy said, “we believe at the highest level that A.W.S. can be at least as big as our other businesses.” Amazon recorded nearly \$50 billion in revenue last year. Mr. Jassy thinks A.W.S. is probably less than 10 percent of its eventual size.

The lower cost of computing, along with overnight deployment of machines, drives the business. Germany’s Spiegel TV paid A.W.S. to make digital copies of 20,000 programs. It cost less than Spiegel would have paid for the electricity powering its own servers.

GoodData, based in San Francisco, analyzes data from 6,000 companies on A.W.S. to find things like sales leads. “Before, each company needed at least five people to do this work,” said Roman Stanek, GoodData’s chief executive. “That is 30,000 people. I do it with 180. I don’t know what all those other people will do now, but this isn’t work they can do anymore. It’s a winner-takes-all consolidation.”

All that data running through Amazon’s cloud also has value. People leave bits of data about themselves that others then analyze. At any given time on A.W.S., there are about one million uses of a powerful database, called **Elastic MapReduce**, that is used to make predictions. Some suggest a new movie or video game to play, while others log behavior for advertising, credit history or suggestions about whom to date. (Companies have to permit their data to be analyzed, and Amazon says it applies the same security standards it uses on its retail site.)

The efficiency of this hyper-aware environment is already remaking jobs for many and will most likely dislocate more. “You can now test a product against millions of users for just a few thousand dollars, or start a company with just one or two people,” said Graham Spencer, a partner at Google Ventures, which invests in data-heavy start-ups that rely on such cheap computing. “It’s a huge change for Silicon Valley.”

That vision is in line with the way Mr. Bezos sees A.W.S., say executives who have worked with him. “Jeff thinks on a planetary level,” said David Risher, a former Amazon senior executive who now heads a charity called **Worldreader**, which uses A.W.S. to download books to thousands of computers in Africa. “A.W.S. is an opportunity, as a business. But it is also a philosophy of enabling other people to build big systems. That is how Amazon will make a dent in the universe.”