Amazon Web Services in Action, Second Edition

MICHAEL WITTIG
ANDREAS WITTIG
FOREWORD BY BEN WHALEY

MANNING
Shelter Island

brief contents

contents

Part 1

Getting started

Have you watched a blockbuster on Netflix, bought a gadget on Amazon.com, or booked a room on Airbnb today? If so, you have used Amazon Web Services (AWS) in the background. Because Netflix, Amazon.com, and Airbnb all use Amazon Web Services for their business.

Amazon Web Services is the biggest player in the cloud computing markets. According to analysts, AWS maintains a market share of more than 30%.[1] Another impressive number: AWS reported net sales of $4.1 billion USD for the quarter ending in June 2017.[2] AWS data centers are distributed worldwide in North America, South America, Europe, Asia, and Australia. But the cloud does not consist of hardware and computing power alone. Software is part of every cloud platform and makes the difference for you, as a customer who aims to provide a valuable experience to your services's users. The research firm Gartner has yet again classified AWS as a leader in their Magic Quadrant for Cloud Infrastructure as a Service in 2017. Gartner's Magic Quadrant groups vendors into four quadrants: niche players, challengers, visionaries, and leaders, and provides a quick overview of the cloud computing market.[3] Being recognized as a leader attests AWS's high speed and high quality of innovation.

---

1 Synergy Research Group, "The Leading Cloud Providers Continue to Run Away with the Market," http://mng.bz/qDYo.

2 Amazon, 10-Q for Quarter Ended June 30 (2017), http://mng.bz/1LAX.

3 AWS Blog, "AWS Named as a Leader in Gartner's Infrastructure as a Service (IaaS) Magic Quadrant for 7th Consecutive Year," http://mng.bz/0W1W.

The first part of this book will guide you through your initial steps with AWS. You will get an impression of how you can use AWS to improve your IT infrastructure.

Chapter 1 introduces cloud computing and AWS. This will get you familiar with the big-picture basics of how AWS is structured.

Chapter 2 brings Amazon Web Service into action. Here, you will spin up and dive into a complex cloud infrastructure with ease.

1 What is Amazon Web Services?

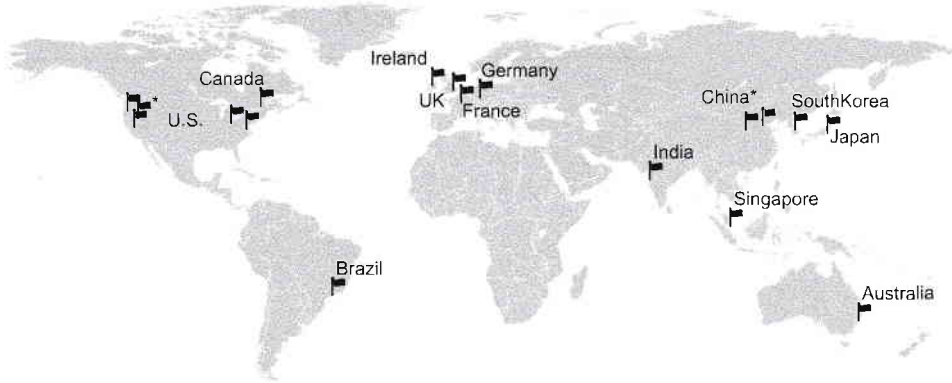
This chapter covers

- Overview of Amazon Web Services
- The benefits of using Amazon Web Services
- What you can do with Amazon Web Services
- Creating and setting up an AWS account

Amazon Web Services (AWS) is a platform of web services that offers solutions for computing, storing, and networking, at different layers of abstraction. For example, you can use block-level storage (a low level of abstraction) or a highly distributed object storage (a high level of abstraction) to store your data. You can use these services to host websites, run enterprise applications, and mine tremendous amounts of data. *Web services* are accessible via the internet by using typical web protocols (such as HTTP) and used by machines or by humans through a UI. The most prominent services provided by AWS are EC2, which offers virtual machines, and S3, which offers storage capacity. Services on AWS work well together: you can use them to replicate your existing local network setup, or you can design a new setup from scratch. The pricing model for services is pay-per-use.

As an AWS customer, you can choose among different *data centers*. AWS data centers are distributed worldwide. For example, you can start a virtual machine in Japan in exactly the same way as you would start one in Ireland. This enables you to serve customers worldwide with a global infrastructure.

The map in figure 1.1 shows AWS's data centers. Access is limited to some of them: some data centers are accessible for U.S. government organizations only, and special conditions apply for the data centers in China. Additional data centers have been announced for Bahrain, Hong Kong, Sweden, and the U.S..



* Limited access

Figure 1.1 AWS data center locations

In more general terms, AWS is known as a *cloud computing platform*.

1.1 What is cloud computing?

Almost every IT solution is labeled with the term *cloud computing* or just *cloud* nowadays. Buzzwords like this may help sales, but they're hard to work with in a book. So for the sake of clarity, let's define some terms.

Cloud computing, or the cloud, is a metaphor for supply and consumption of IT resources. The IT resources in the cloud aren't directly visible to the user; there are layers of abstraction in between. The level of abstraction offered by the cloud varies, from offering virtual machines (VMs) to providing software as a service (SaaS) based on complex distributed systems. Resources are available on demand in enormous quantities, and you pay for what you use.

The official definition from the National Institute of Standards and Technology:

> *Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (networks, virtual machines, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.*
>
> —National Institute of Standards and Technology, *The NIST Definition of Cloud Computing*

Clouds are often divided into three types:

- *Public*—A cloud managed by an organization and open to use by the general public.
- *Private*—A cloud that virtualizes and distributes the IT infrastructure for a single organization.
- *Hybrid*—A mixture of a public and a private cloud.

AWS is a public cloud. Cloud computing services also have several classifications:

- *Infrastructure as a service (IaaS)*—Offers fundamental resources like computing, storage, and networking capabilities, using virtual machines such as Amazon EC2, Google Compute Engine, and Microsoft Azure.
- *Platform as a service (PaaS)*—Provides platforms to deploy custom applications to the cloud, such as AWS Elastic Beanstalk, Google App Engine, and Heroku.
- *Software as a service (SaaS)*—Combines infrastructure and software running in the cloud, including office applications like Amazon WorkSpaces, Google Apps for Work, and Microsoft Office 365.

The AWS product portfolio contains IaaS, PaaS, and SaaS. Let's take a more concrete look at what you can do with AWS.

1.2 What can you do with AWS?

You can run all sorts of application on AWS by using one or a combination of services. The examples in this section will give you an idea of what you can do.

1.2.1 Hosting a web shop

John is CIO of a medium-sized e-commerce business. He wants to develop a fast and reliable web shop. He initially decided to host the web shop on-premises, and three years ago he rented machines in a data center. A web server handles requests from customers, and a database stores product information and orders. John is evaluating how his company can take advantage of AWS by running the same setup on AWS, as shown in figure 1.2.

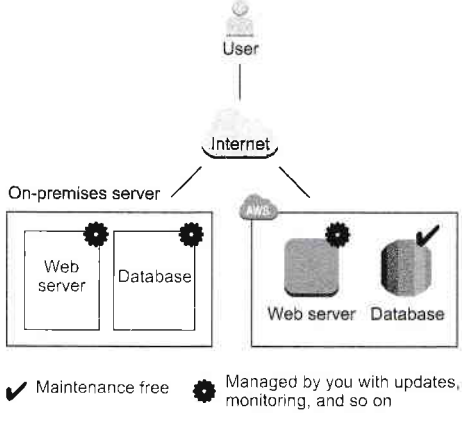


Figure 1.2 Running a web shop on-premises vs. on AWS