Categories of Cloud Solutions

The cloud is a terminology that describes large sets of computers that are networked together in groups called data centers. These clustered machines can be interacted with via dashboards, command-line interfaces, REST APIs, and client libraries. Data centers are often distributed across multiple geographical locations. The size of data centers is over 100,000 sq. ft. (and those are the smaller sizes!). Cloud computing solutions can be broadly categorized into three, namely, the public, private, and hybrid cloud. Let's briefly discuss them:

- Public cloud: Public clouds are the conventional cloud computing model, where cloud service providers make available their computing infrastructure and products for general use by other enterprises and individuals (see Figure 1-1). In public clouds, the cloud service provider is responsible for managing the hardware configuration and servicing.

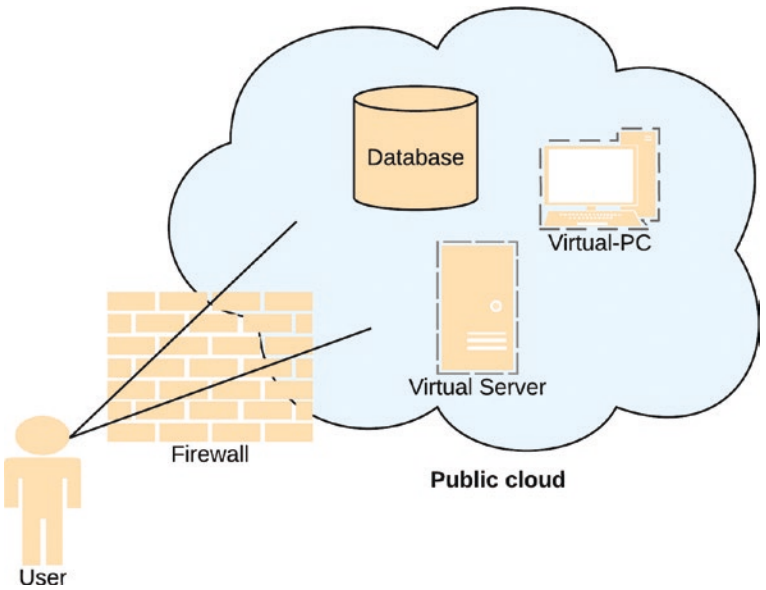

Figure 1-1. *The public cloud*

- Private cloud: In a private cloud, an organization is solely responsible for the management and servicing of its computing infrastructure. The machines in a private cloud can be located on-premises, or it can be hosted with a cloud service provider but routed on a private network.
- Hybrid cloud: The hybrid cloud is a compromise between the cost and efficiency of a public cloud and the data sovereignty and in-house security assurances of the private cloud. Many companies and institutions opt for a hybrid cloud and multi-cloud by using technology solutions to facilitate easy porting and sharing of data and applications between on-premise and cloud-based infrastructures.

Cloud Computing Models

Cloud computing is also categorized into three models of service delivery. They are illustrated as a pyramid as shown in Figure 1-2, where the layers of infrastructure abstraction increase as we approach the apex of the pyramid:

- Infrastructure as a Service (IaaS): This model is best suited for enterprises or individuals who want to manage the hardware infrastructure that hosts their data and applications. This level of fine-grained management requires the necessary system administration skills.
- Platform as a Service (PaaS): In the PaaS model, the hardware configuration is managed by the cloud service provider, as well as other system and development tools. This relieves the user to focus on the business logic for quick and easy deployment of application and database solutions. Another concept that comes up together with PaaS is the idea of **Serverless**, where the cloud service provider manages a scalable infrastructure that utilizes and relinquishes resources according to demand.
- Software as a Service (SaaS): The SaaS model is most recognizable by the general public, as a great deal of users interact with SaaS applications without knowing. The typical examples of SaaS