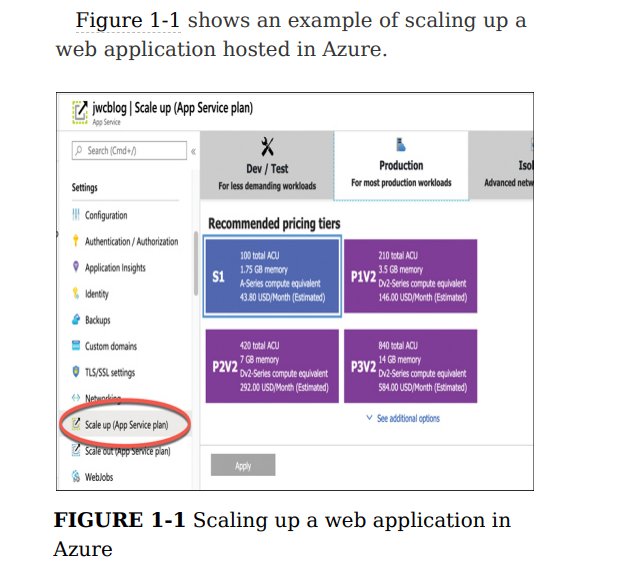
Chapter 1

DESCRIBE CLOUD CONCEPTS  
This chapter covers the benefits of using the cloud, the different cloud services that are available, and cloud models that enable a variety of cloud configurations.  
  
High availability   
Scalability  
Elasticity  
agility Fault tolerance and disaster recovery   
Economic benefits of the cloud  
  
Cloud providers offer a service-level agreement **(SLA)** that guarantees a certain level of availability as a percentage. An SLA will usually guarantee an uptime of close to 100 percent, **but it only covers systems that are controlled by the cloud provider**

Network outage  
Application failure  
Application Insights that integrates with your application to give you detailed information about the performance and reliability of your application. Application developers can often use this information to get right to the code where a problem is happening, dramatically reducing the time needed for troubleshooting.  
  
System outage  
Power outage  
Cloud providers invest heavily in batteryoperated power backups and other redundant systems in order to prevent availability problems caused by power outages.  
In a situation where a large geographic area is affected by a power outage, cloud providers offer you the ability to run your application from another region that isn’t affected

Scaling and elasticity  
Allow you to easily deal with these kinds of scenarios. Scaling is the process of adding additional resources or additional power for your application. There are two variations of scaling: horizontal scaling (often referred to as scaling out) and vertical scaling (often referred to as scaling up). When you scale out, you add additional VMs for your application. Each VM you add is identical to other VMs servicing your application. Scaling out provides additional resources to handle additional load.

When you scale up, you move to a new VM with additional resources. For example, you might determine that you need a more powerful CPU and more memory for your application. In that case, scaling up will allow you to move your application to a more powerful VM.  
  


**The concept of automatically scaling is referred to as elasticity.**

**This kind of speed and flexibility in the cloud is often called cloud agility.**If you determine that you need two more VMs for your application, you can scale out to three VMs in seconds. Azure takes care of allocating the resources for you. All you have to do is tell Azure how many VMs you want and you’re up and running  
  
Don’t confuse fault tolerance with scaling. Scaling allows you to react to additional load or resource needs, but it’s always assumed that all the VMs you are using are healthy. Fault tolerance happens without any interaction from you, and it’s designed to automatically move you from an unhealthy system to a healthy system if things go wrong  
  
Disaster Recovery and Governments Depending on what kind of data you store, you might be required to have a disaster recovery plan in place. Cloud providers typically comply with standards imposed by laws such as the Health Insurance Portability and Accountability Act (HIPAA), and they often provide compliance tools you can use to ensure compliance.

Disaster recovery not only means having reliable backups of important data, but it also means that the cloud infrastructure can replicate your application’s resources in an unaffected region so that your data is safe and your application availability isn’t affected. Disaster recovery plans are commonly referred to as Business Continuity and Disaster Recovery (BCDR) plans, and most cloud providers have services that can help you develop and implement a plan that works for your particular needs