

- » Introducing the cloud
- » Differentiating among the cloud computing models
- » Introducing the major Microsoft Azure services
- » Starting your Azure subscription

Chapter **1**

Introducing Microsoft Azure

Welcome to cloud computing, and welcome to Microsoft Azure! I'm not sure what occurred in your professional or personal life to lead you to read this book, but I'm glad you're here with me. In this chapter, I cover ground-level terminology, beginning with precisely what buzzwords *the cloud* and *cloud computing* mean.

By the end of this chapter, you'll have your very own Azure subscription running at the free tier. Are you excited? I hope so!

What Is Cloud Computing?

My 9-year-old daughter Zoey knows what the cloud is. "It's where my iPad apps are stored," she says. "If I delete an app from my iPad, I can download it again from the cloud." I can't argue with that.

My 75-year-old mother told me that as far as she's aware, the cloud is "a part of the Internet where you can save your stuff." True enough.

Most people use cloud services whether they're aware of doing so or not. Think of your smartphone. Where do you think your photos, media, files, and settings are being backed up? What is behind your ability to retrieve your content wherever you are in the world, provided that you have an Internet connection?

Do you use a web-hosting company to host your personal website? Where is the physical server that houses your website?

These scenarios are examples of cloud computing, in which you simply rent resources on another organization's infrastructure.

The resources you rent consist of the following hardware and software components:

- » **Compute:** *Compute* is raw computing power — the central processing unit (CPU) and random-access memory (RAM) that form the platform for applications and data.
- » **Storage:** *Persistent storage* means you have a place on Microsoft's servers to store your files and other data. When you save a file to a cloud-hosted storage account, the file should remain in place forever, or at least until you move or delete it.
- » **Network:** Azure provides a software-defined network infrastructure on which you can host your virtual machines and other Azure services. Because the cloud almost always involves an Internet connection, *online* and *cloud* are essentially synonymous. I say "almost always" because a business can create a private cloud that shares most attributes of a public cloud but is local to its private network environment. Microsoft also sells a private, portable version of Azure called Azure Stack.
- » **Analytics:** You'll never get to touch the cloud provider's compute, storage, or network resources. The closest you'll get is viewing its telemetry data in your web browser or from a management app. Thus, Azure and other public cloud providers give you tools to see precisely how much of their services you consume each minute. Cloud analytics also gives you valuable troubleshooting and performance-tuning advice for your cloud infrastructure.

Businesses are interested in using the cloud because it allows them to offload a lot of what's scary, annoying, and/or expensive about maintaining an on-premises data center, such as the following:

- » **Power:** It's potentially very expensive to provide electricity to all the equipment necessary to host your applications and services. And what happens if your on-campus data center experiences a utilities outage? When you move your data into the cloud, your provider takes on the risk of these issues.

- » **Capital expenditure:** When you run an on-premises data center, you either rent your physical servers or purchase them outright. As such, you're responsible for all hardware upgrades and repairs. All that hardware can be expensive too.
- » **Security and configuration overhead:** If you can't afford local systems administrators, or if your existing resources are stretched thin, it can be too easy to leave a vulnerability in place on an on-premises server that can be compromised by bad actors. By contrast, when you use a public cloud service like Azure, you rely upon Microsoft's human and machine learning-based threat intelligence to help keep your applications, services, and data safe.

Do you see the trend here? Cloud computing is popular because it's convenient for the end user and cheaper for the enterprise business. Before I go any further, however, I want to codify what I mean by *cloud computing*.

NIST definition

The National Institute of Standards and Technology (NIST, pronounced *nihst*), a research laboratory in the United States, developed the standard definition of cloud computing. According to NIST, the five essential characteristics of cloud computing are

- » **On-demand self-service:** A cloud customer can provision services at any time and is charged only for the resources that he or she consumes.
- » **Broad network access:** Cloud services are ordinarily offered globally, and the customer is encouraged to place services as geographically near its consumers as possible.
- » **Resource pooling:** Cloud services are *multitenant*, which means that different customers' environments are isolated. You should never, ever see another Azure customer's data, and vice versa.
- » **Rapid elasticity:** A cloud services customer can accommodate variable traffic patterns by configuring their services to scale accordingly. For instance, you can configure Azure to automatically duplicate your web servers to accommodate traffic spikes and then remove servers automatically when they are no longer needed.
- » **Measured service:** The cloud offers services on demand, which are metered; once again, customers pay only provisioned resources.



If you want to read the source material, check NIST Special Publication 800-145, *The NIST Definition of Cloud Computing*, which you can download from <https://csrc.nist.gov/publications/detail/sp/800-145/final>.

Cloud computing benefits

As I mention earlier in this chapter, cloud computing is attractive to both businesses and consumers because of its convenience, high availability, and potential cost savings. Specifically, Microsoft Azure or any other public cloud service uses a consumption-based spending model that's classified as an operational expenditure (OpEx).

Purchasing or leasing on-premises infrastructure is an up-front capital expenditure (CapEx). By contrast, the relatively predictable, recurring cost model of OpEx is appealing to cost-conscious organizations (and what organization isn't cost-conscious nowadays?).

The cloud's rapid scalability and elasticity are capabilities that only the largest companies in the world can afford to manage on their own. Microsoft Azure enables smaller companies and individuals to replicate a SQL database between geographical regions with a couple of mouse clicks. (See Figure 1-1.) Making high availability this accessible to customers is an enormous benefit of cloud computing.

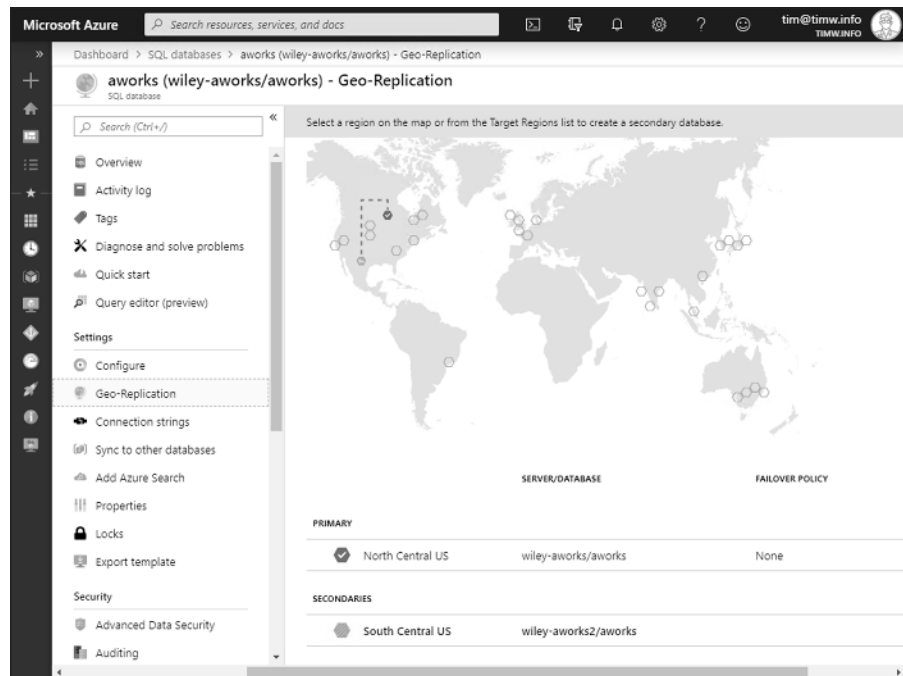


FIGURE 1-1: In Azure, you can make a database geographically available with only a couple of clicks.

OTHER CLOUD PROVIDERS

For completeness, I want you to know that although this book's focus is Microsoft Azure, other major public cloud providers also take advantage of economies of scale. These public cloud providers include, but aren't limited to, the following:

- Amazon Web Services (AWS)
- Google Cloud Platform (GCP)
- IBM Cloud
- Oracle Cloud
- Salesforce

Economies of scale

The term *economies of scale* means that a business that purchases its internal resources at a larger volume can pass along savings to its customers.

At this writing, Microsoft has its Azure product portfolio spread across 54 regions worldwide. Within each region are two or more physical data centers. Within each data center are untold numbers of server racks, blade servers, storage arrays, routers, switches, and so forth — an immense physical capacity. I think we can reasonably assume that Microsoft gets a discount from the original equipment manufacturers (OEMs) because it purchases in such huge volume. Microsoft's purchase discounts means that the company in turn extends the savings to its Azure customers. It's as simple as that.

Understanding Cloud Computing Models

The working definition of *cloud computing* is a subscription arrangement under which a person or business rents a cloud service provider's infrastructure and pays only for the services consumed. That definition is fine.

In this section, however, I want to sharpen your general understanding of cloud computing by explaining the deployment and service delivery models.

Deployment models

In Azure nomenclature, *deployment* refers to your provisioning resources in the Azure public cloud. You may be saying, “What’s this? Why is Microsoft Azure called a public cloud? I thought you said that different Azure customers can never see each other’s resources by default.” Hang on; hang on. Let me explain.

Public cloud

Microsoft Azure is a public cloud because its global data center fabric is accessible by the general public. Microsoft takes Azure’s multitenant nature very seriously; therefore, it adds layer after layer of physical and logical security to ensure that each customer’s data is private. In fact, in many cases, even Microsoft doesn’t have access to customers’ data encryption keys!

Other major cloud service providers — including AWS, GCP, Oracle, and IBM (see the nearby sidebar “Other cloud providers”) — are also considered to be public cloud platforms.



Microsoft has three additional, separate Azure clouds for exclusive governmental use. Thus, the Microsoft literature contains references to Azure Cloud, which refers to its public cloud, and to Azure Government Cloud, which refers to its sovereign, special-access clouds. No member of the general public can access an Azure Government Cloud without being associated with a government body that employs it.

Private cloud

As I mention earlier, very, very few businesses have enough financial, capital, and human resources to host their own cloud environments. Typically only the largest enterprise organizations can afford having their own private cloud infrastructure with redundant data centers, storage, networking, and compute, but they may have security prohibitions against storing data in Microsoft’s (or any other cloud provider’s) physical data centers.

Microsoft sells a portable version of the Azure cloud: Azure Stack, which consists of a server rack that a company leases or purchases from a Microsoft-affiliated hardware or service provider.

The idea is that you can bring the hallmarks of cloud computing — on-demand self-service, resource pooling, elasticity, and so forth — to your local environment without involving either the Internet or an external cloud provider unless you want to.

Your administrators and developers use the same Azure Resource Manager (ARM) application programming interface (API) to deploy resources locally to Azure Stack as they use to deploy to the Azure public cloud. This API makes it a snap to bring cloud-based services on premises, and vice versa. You'll learn about ARM in Chapter 2.

Hybrid cloud

When you combine the best of on-premises and cloud environments, you have a hybrid cloud.

In my professional experience, the hybrid cloud deployment model makes the most sense for most businesses. Why? A hybrid cloud allows the business to salvage (read: continue to use) the on-premises infrastructure that it's already paid for while leveraging the hyper scale of the Azure public cloud.

Take a look at Figure 1-2. In this topology, the on-premises network is extended to a virtual network running in Azure. You can do all sorts of nifty service management here, including

- » Joining the Azure virtual machines (VMs) to your local Active Directory domain.
- » Managing your on-premises servers by using Azure management tools.
- » Providing nearly instant failover disaster recovery (DR) by using Azure as a DR site. Failover refers to having a replicated backup of your production servers available somewhere else so that you can shift from your failed primary environment to your backup environment within minutes. Failover is critical for businesses that cannot afford the downtime involved in restoring backups from a backup archive.

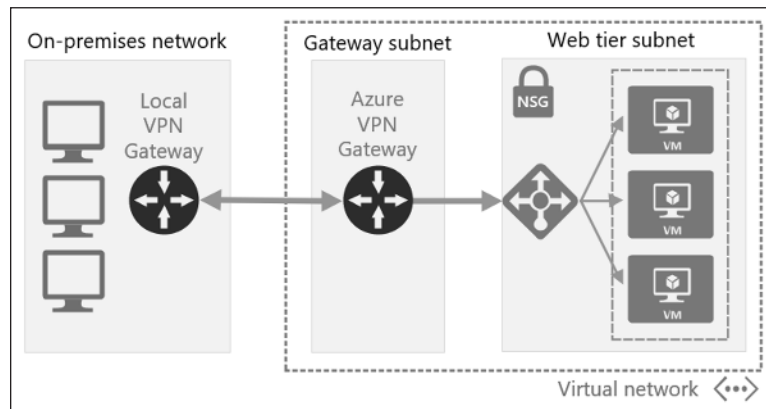


FIGURE 1-2: A hybrid cloud in which the on-premises corporate network extends to Azure.

By the end of this book, you'll understand how to deploy the environment you see in Figure 1-2, but here's an overview of what's going on:

- » On the left side is a local business network that connects to the Internet via a virtual private network (VPN) gateway.
- » On the right (Azure) side is a three-VM deployment in a virtual network. A site-to-site VPN connects the local environment to the virtual network. Finally, an Azure load balancer spreads incoming traffic equally among the three identically configured web servers in the web tier subnet. As a result, the company's internal staff can access the Azure-based web application over a secure VPN tunnel and get a low-latency, reliable, always-on connection to boot.



REMEMBER

In this book, I refer to a local, physical network environment as an *on-premises environment*. In the wild, you'll see stray references to “on premise”—sadly, even in Microsoft's Azure documentation. Don't make this mistake. A *premise* is an idea; *premises* refers to a location.

In my experience, only small businesses are agile enough to do all their work in the Azure cloud. That said, you may find that after your organization gets its sea legs with Azure and begins to appreciate its availability, performance, scalability, and security possibilities, you'll be working to migrate more on-premises infrastructure into Azure, and you'll be targeting more of your line-of-business (LOB) applications to the cloud first.

Service delivery models

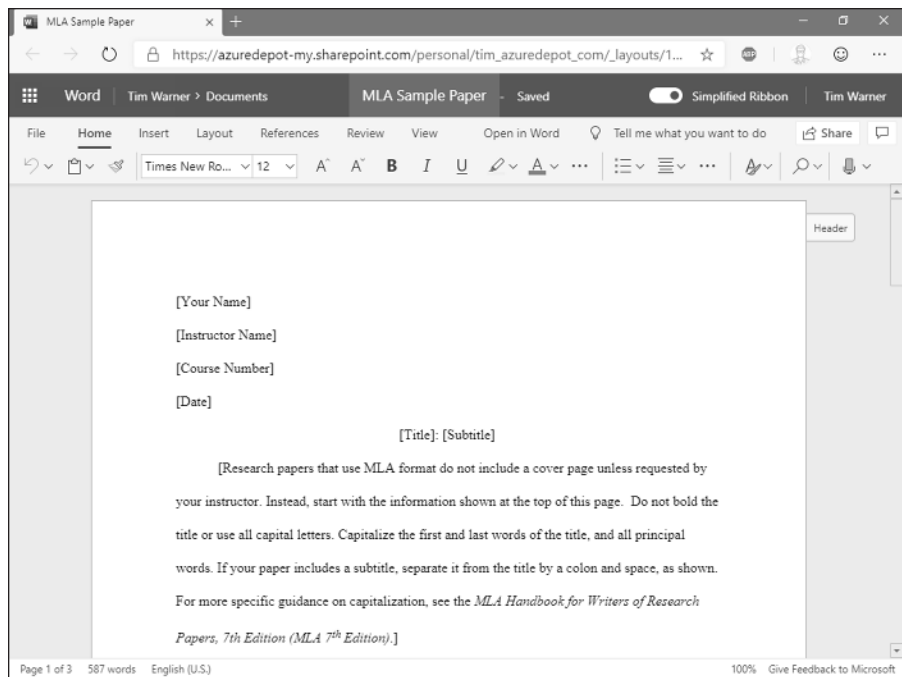
Organizations deploy applications in three primary ways: Software as a Service, Infrastructure as a Service, and Platform as a Service.

Software as a Service (SaaS)

An SaaS application is a finished, customer-facing application that runs in the cloud. Microsoft Office 365 is a perfect example. As shown in Figure 1-3, you can use Word Online to create, edit, and share documents with only a web browser; an Internet connection; and an Office 365 subscription, which you pay for each month on a subscription basis.

With SaaS applications, you have zero visibility into the back-end mechanics of the application. In the case of Word Online, you neither know nor care how often the back-end servers are backed up, where the Office 365 data centers are geographically located, and so forth. All you care about is whether you can get to your cloud-hosted documents and whether Word Online behaves as you expect.

FIGURE 1-3: Word Online, part of the Microsoft Office 365 product family, is an example of an SaaS application.



Platform as a Service (PaaS)

Much of my work as an Azure solution architect centers on explaining the benefits of PaaS over IaaS in certain scenarios.

Consider a business that runs a three-tier on-premises web application with VMs. The organization wants to move this application workload to Azure to take advantage of the benefits of cloud computing. Because the organization has always done business by using VMs, it assumes that the workload must by definition run in VMs in Azure.

Not so fast. Suppose that the workload consisted of a Microsoft-stack application. Maybe the business should consider using PaaS products such as Azure App Service and Azure SQL Database to leverage autoscale and pushbutton georeplication.

I discuss both Azure App Service and Azure SQL Database later in Part 3. For now, understand georeplication means placing synchronized copies of your service in other geographic regions for fault tolerance and placing those services closer to your users.

Or maybe the workload is an open-source project that uses PHP and MySQL. No problem. Azure App Service can handle that scenario. Microsoft also has a native hosted database platform for MySQL called (appropriately enough) Azure Database for MySQL.

With PaaS, Microsoft takes much more responsibility for the hosting environment. You're not 100 percent responsible for your VMs because PaaS products abstract all that plumbing and administrative overhead away from you.

The idea is that PaaS products free you to focus on your applications and, ultimately, on the people who use those applications. If PaaS has a trade-off, it's that relinquishing full-stack control is an adjustment for many old-salt systems and network administrators.

To sum up the major distinction between IaaS and PaaS, IaaS gives you full control of the environment, but you sacrifice scalability and agility. PaaS gives you full scalability and agility, but you sacrifice some control.



TIP

To be sure, the cloud computing literature contains references to other cloud deployment models, such as community cloud. You'll also see references to additional delivery models, such as Storage as a Service (STaaS) and Identity as a Service (IDaaS). This chapter focuses on the most commonly used cloud deployment and delivery models.

Infrastructure as a Service (IaaS)

I find that most businesses that migrate their applications and services to Azure use the IaaS model, if only because they've delivered their services via VMs in the past — the old “If it ain't broke, don't fix it” approach.

In large part, IaaS is where the customer hosts one or more VMs in a cloud. The customers remain responsible for the full life cycle of the VM, including

- » Configuration
- » Data protection
- » Performance tuning
- » Security

By hosting your VMs in Azure rather than in your on-premises environment, you save money because you don't have to provision the physical and logical resources locally. You also don't have to pay for the layers of geographic, physical, and logical redundancy included in Azure out of the box.

Thus, whereas SaaS is a service that's been fully abstracted in the cloud, and the customer simply uses the application, IaaS offers a split between Microsoft's responsibility (providing the hosting platform) and the customer's responsibility (maintaining the VMs over their life cycle).



WARNING

Cloud computing in general, and Microsoft Azure in particular, use what's called the *shared responsibility model*. In this model, Microsoft's responsibility is providing the tools you need to make your cloud deployments successful — Microsoft's data centers, the server, storage and networking hardware, and so on. Your responsibility is to use those tools to secure, optimize, and protect your deployments. Microsoft isn't going to configure, back up, and secure your VMs automatically; those tasks are your responsibility.

Introducing Microsoft Azure Services

The Microsoft Azure service catalog has hundreds of services. Listing all of them in this book would be a waste of ink and paper, because by the time you read this chapter, the service list will have expanded even more.

Microsoft maintains a services directory at <https://azure.microsoft.com/en-us/services>, but in this chapter, I give you a high-level tour of what Microsoft calls 80 percent services — the Azure products that 80 percent of the customer base uses.

Azure history

In October 2008, Microsoft announced Windows Azure at its Professional Developers Conference. Many people feel that this product was a direct answer to Amazon, which had already begun unveiling AWS to the general public.

The first Azure-hosted service was SQL Azure Relational Database, announced in March 2009. Then came support for PaaS websites and IaaS virtual machines in June 2012. Figure 1-4 shows what the Windows Azure portal looked like during that time.

Satya Nadella became Microsoft's chief operating officer in February 2014. Satya had a vision of Microsoft expanding its formerly proprietary borders, so Windows Azure became Microsoft Azure, and the Azure platform began to embrace open-source technologies and companies that Microsoft formerly considered to be hostile competitors.

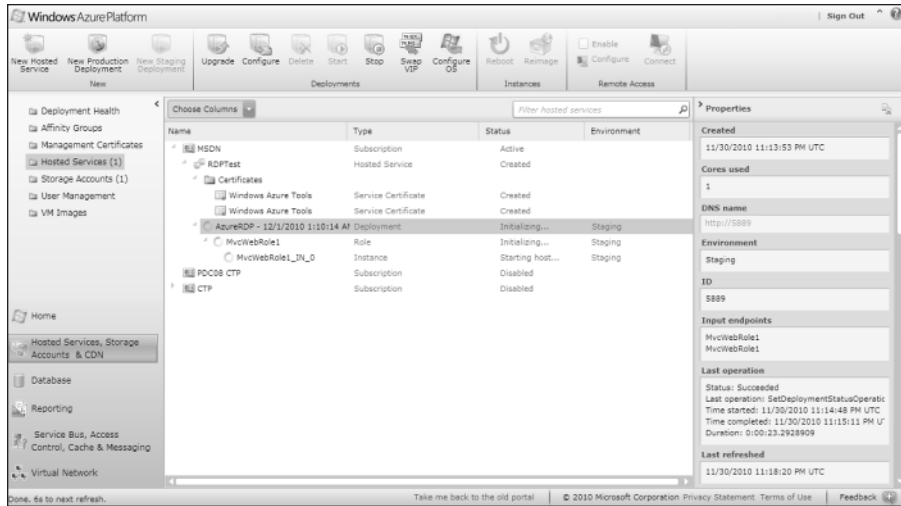


FIGURE 1-4:
The Windows
Azure portal,
circa 2012.



I can't overstate how important that simple name change was and is. Today, Microsoft Azure provides first-class support for Linux-based VMs and non-Microsoft web applications and services, which is a huge deal.

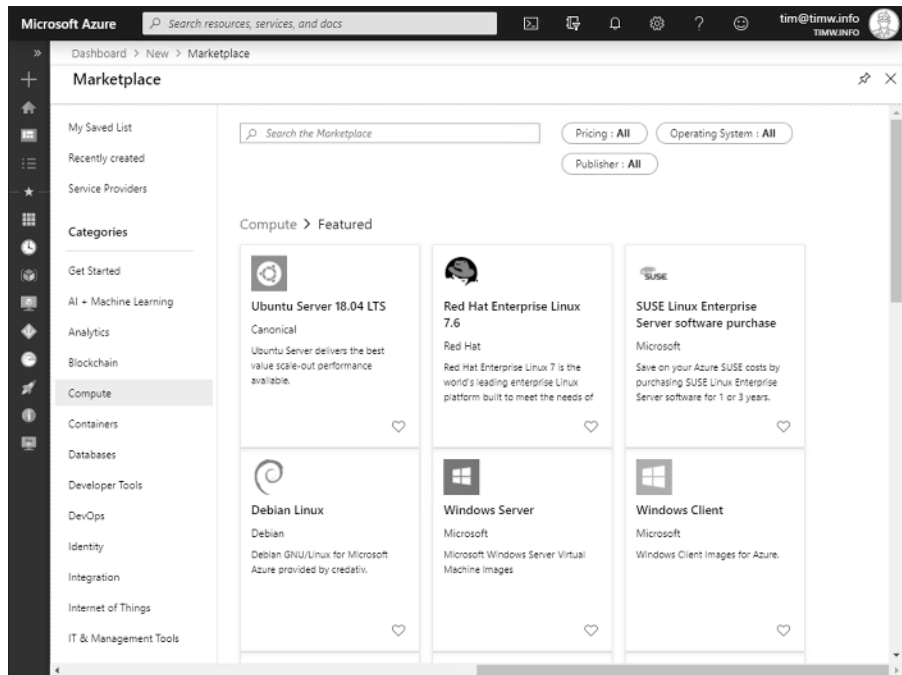
Finally, Microsoft introduced the RM deployment model at Microsoft Build 2014. The API behind Windows Azure was called Azure Service Management (ASM), and it suffered from several design and architectural pain points. ASM made it super-difficult to organize deployment resources, for example, and it was impossible to scope administrative access granularly.

The ARM API is modeled closely on the AWS API (you know the old saw “Imitation is the sincerest form of flattery”), with core architectural concepts such as resource groups and role-based access controls that were direct analogs of features in the AWS cloud.

To support old customers with old deployments, ARM still offers limited support for ASM deployments in the Azure portal (see Chapter 2). These resources are tagged with the suffix *Classic*. This book is committed to the ARM API, however, so I won't be addressing ASM IaaS products.

Azure Virtual Machines is Microsoft's Azure mainline IaaS product. Specifically, the Azure Marketplace in the Azure portal lists thousands of preconfigured VM images from Microsoft, endorsed Linux distributions, and third-party solution providers. You can see the gallery of VM images in Figure 1-5.

FIGURE 1-5:
The Azure Marketplace includes prebuilt Windows and Linux VM images.



You can migrate your on-premises physical and virtual machines to Azure, of course, as well as create custom VM images. I'll get to those topics in time; I promise.

PaaS products

The Azure product portfolio is filled with powerful, cost-saving PaaS offerings. Following are some of the more high-profile Azure PaaS products:

- » **App Service:** Web Apps, Mobile Apps, API Apps, Logic Apps, and Function Apps
- » **Databases:** Cosmos DB, Azure SQL Database, Azure Database for MySQL, and Azure Cache for Redis
- » **Containers:** Azure Container Instances, Azure Container Registry, and Azure Kubernetes Service
- » **DevOps:** Azure DevOps and Azure DevTest Labs
- » **Internet of Things (IoT):** Azure IoT Hub, Azure IoT Edge, Azure Sphere, and Azure Digital Twins

- » **Machine learning:** Azure Machine Learning Service, Azure Bot Service, Cognitive Services, and Azure Search
- » **Identity:** Azure Active Directory, Azure AD Business-to-Business, and Azure AD Business-to-Consumer
- » **Monitoring:** Application Insights, Azure Monitor, and Azure Log Analytics
- » **Migration:** Azure Site Recovery, Azure Cost Management, Azure Database Migration Service, and Azure Migrate

Starting Your First Azure Subscription

You can have a free, low-obligation trial of the Microsoft Azure platform with the Azure free account. *Low-obligation* means that you have to provide some personal details and a legitimate payment type. Microsoft uses your credit card information only for identity verification.

Many people have some trepidation about signing up for a public cloud service, even if it's promised to be free, for reasons such as these:

- » Does Microsoft begin to charge my credit card when the free trial period expires?
- » What if I accidentally leave an Azure service running? Will Microsoft ding my credit card for it?

I can address these and other perfectly reasonable concerns, starting by explaining how Azure subscriptions work.

Understanding subscription types

When you sign up for an Azure free account, you receive \$200 (or the equivalent in your local currency) to spend on any Azure service over a 30-day period. At the end of the 30 days, Microsoft does not convert your account to pay as you go (PAYG), the typical paid subscription offer.

Instead, any running services you have are stopped, and to restart your services, you need to convert your trial account manually to a PAYG account or other subscription offer in the Azure portal.

That said, the Azure free account provides 12 months of free availability to several IaaS and PaaS services, including the following:

- » 750 hours of B1S General Purpose VMs running Windows Server or Linux
- » 5 GB locally redundant hot-tier blob storage
- » 10 web, mobile, or API apps with 1 GB storage
- » 5 GB Cosmos DB instance
- » 250 GB Azure SQL Database (S0 instance size)
- » 15 GB outbound data transfer from Azure



TECHNICAL
STUFF

You can see a full list of Azure free tier services by looking up the Free services blade in the Azure portal or by visiting the Azure Free Account FAQ page at <https://azure.microsoft.com/en-us/free/free-account-faq>.



REMEMBER

“Blade” is the term Microsoft uses to describe any specific web page in the Azure portal. I use the word a lot in this book, and you’ll see it all the time in the Azure documentation.

Additionally, several Azure services run on an always-free tier; you’ll need to check <https://azure.microsoft.com/en-us> for specifics. Remember, however, that the free tier services aren’t there for you to run production workloads. The tier exists to give you an opportunity to test Azure, to see whether it may fit your professional or personal needs.

Pay-As-You-Go (PAYG for short) is the most common standard subscription offer. Each month, you receive an invoice stating charges for the Azure resources you consume outside the Azure free-tier services.

The Enterprise Agreement (EA) is a special-purpose contract intended for larger businesses that are willing to commit to a three-year Azure subscription. Microsoft offers EA customers special discounts on Azure services and provides them a special management portal for analyzing spending, creating budgets, tracking use, and so forth.

Under EA, you pay your yearly fee up front and must use it or lose it. If you commit to \$12,000 for the first year and spend only \$9,000 by December 31, for example, you lose the remaining \$3,000. At the end of each contract year, however, you can adjust your fee for the upcoming year to better match your use and expectations.

Several other Azure subscription offers grant recurring monthly credits, including these:

- » **Visual Studio:** Given to those who have a Visual Studio Online subscription
- » **Action Pack:** Given to Microsoft Partner Network members
- » **Azure for Students:** A free credit (\$100) over 12 months for students with a verified academic email address
- » **Azure Pass:** Normally granted by Microsoft to Azure user groups and educational institutions, and intended for free distribution

Creating a free Azure account

To sign up for an Azure free account, you need an Internet connection and any modern web browser.



TIP

I suggest that you perform this procedure (and all procedures in this book) on a desktop or laptop computer rather than a tablet or smartphone. Microsoft makes the Azure portal as mobile-friendly as possible but given the amount of typing you'll be doing, I recommend using a larger computer.

Follow these steps to create your account:

1. Browse to <https://azure.microsoft.com/en-us> and look for a free-account.

Microsoft changes the Azure website regularly, so I hesitate to ask you to look in a particular spot for the link or a button. Somewhere on the page, you'll find the link or button to click.

2. Sign in with your Microsoft account, or create a new one.

The Azure free account is a Microsoft account, which powers all of the company's online services, including Xbox and Office 365. If you already have a Microsoft account, however, you may want to create a new one exclusively for Azure use. I suggest this because you probably want to keep your Azure business completely isolated from, say, your Xbox leisure.

3. In the About You section, provide your contact details, and click Next.

Microsoft needs this information to set up your Azure subscription. It also uses your telephone number, email address, and payment details to verify your identity.

4. In the Identity Verification by Card section of the next page, provide valid credit card details.

Note that you can't use a prepaid credit card or gift card; the card has to be a legitimate credit or debit card with your name and billed to your address. Microsoft won't charge your account unless you upgrade to a paid subscription offer. That said, Microsoft may put a \$1 verification hold on your credit card account; this hold is lifted within three to five business days.

You can have only one Azure free account, and Microsoft performs the identity verification in part to prevent fraud.

5. In the Agreement section, confirm that you agree to the subscription agreement, offer details, and privacy statement; then click Sign Up.

6. On the You're Ready to Start with Azure page that appears, click Go to the Portal.

You're done and ready to rock. That was easy, wasn't it?

You should now see the Azure portal, along with a Welcome to Microsoft Azure message, as shown in Figure 1-6.

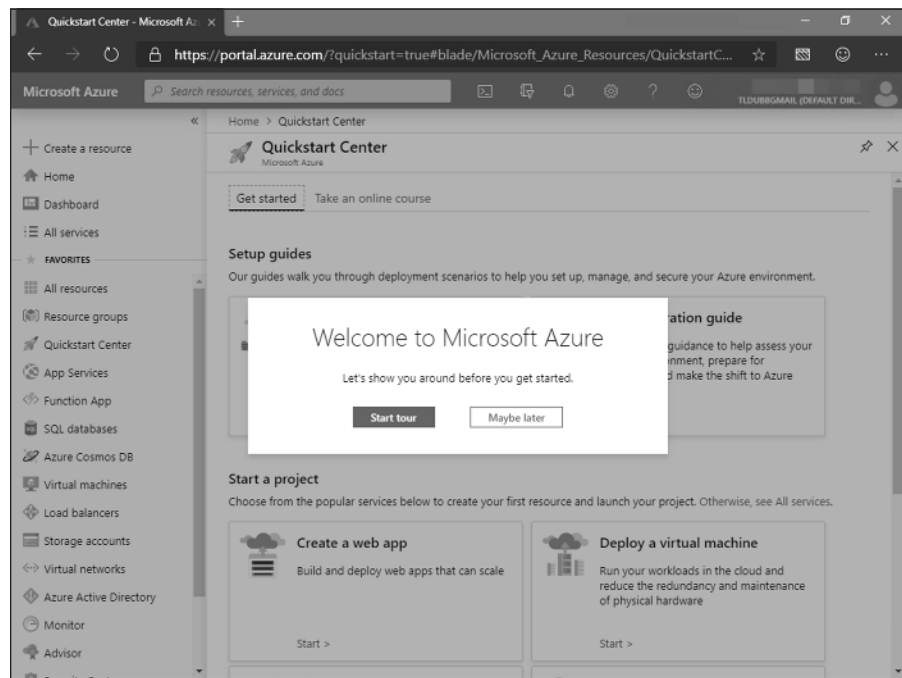


FIGURE 1-6: Signing in to the Azure portal for the first time.

I formally introduce the Azure portal in Chapter 2. For now, bookmark this address (<https://portal.azure.com>), because you'll be using it a lot from now on.

Click Start Tour to take a spin around the Azure portal. In the background of Figure 1-6, you see the Quickstart Center; you can return to this blade at any time by typing **quickstart center** in the Search box on the top navigation bar. The Quickstart Center contains links to the documentation and to Microsoft Learn, Microsoft's free Azure education portal.



REMEMBER

The windows in the Azure portal are called *blades*.

Viewing subscription details

Follow these steps to view your Azure free-account subscription details:

1. Type subscriptions in the Search box in the Azure portal.

The Subscriptions option should appear almost instantly. (I'm a huge fan of the global search feature in the Azure portal, and I hope you'll become one too.)

2. In the Subscriptions blade, select your Free Trial subscription.

Before you click Free Trial, notice the information that the Subscriptions blade gives you: Your account role is Account Admin, and the status of the account is Active. So far, so good.

3. Examine the various subscription management tools.

Figure 1-7 shows the following tools:

- *A*: The Overview setting shows you the Essentials panel (shown on the right side of the figure), where you see details on your subscription status and metadata.
- *B*: The Cost Management settings enable you to report on the Azure service you've consumed and/or are currently consuming.
- *C*: The Payment Methods setting enables you to change the payment method associated with your subscription.
- *D*: Upgrade Subscription enables you to convert your free trial to a PAYG subscription. If you convert before you spend the \$200 or reach the 30 days, you keep your credit before the cost meter starts ticking.
- *E*: The Manage button takes you to the Azure Account Center, where you can print past service invoices, set billing alerts, and change the account that owns the subscription.

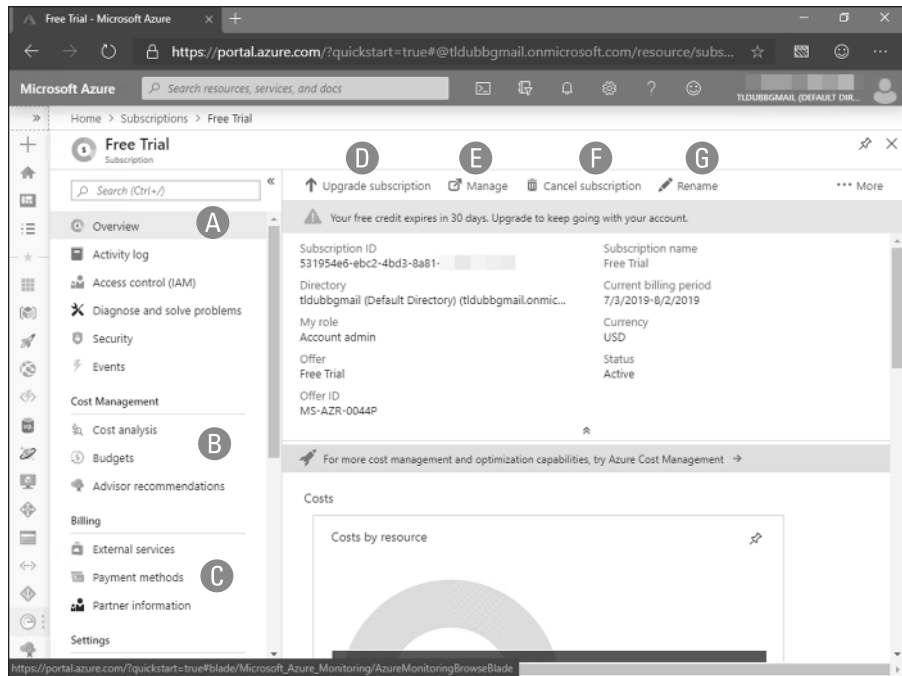


FIGURE 1-7:
Viewing your Free Trial subscription in the Azure portal.

- **F:** The Cancel Subscription button enables you to . . . well, cancel your subscription. What else?
- **G:** The Rename button enables you to change the logical name of your subscription from Free Tier to something more meaningful to you and your organization.

If you decide to upgrade your subscription, Microsoft asks whether you want to buy a monthly support plan. As with the PAYG subscription, you can cancel a support plan at any time with no penalty. The three support tiers, each of which has a fixed monthly cost, are

- » **Developer plan:** Support for trial and nonproduction environments. You can interact with Azure support staff members from 9 a.m. to 5 p.m. in your time zone, with an initial response time of less than 8 business hours. As of this writing in November 2019, the monthly cost is \$29.
- » **Standard plan:** Support for production environments. You receive 24/7 technical support and a response within 2 hours. As of this writing, the Standard plan costs \$100 per month.

- » **Professional Direct plan:** Support for businesses that rely heavily on Azure. You get 24/7 technical support and a response for critical issues within one hour. As of this writing, Microsoft charges \$1,000 per month for this support plan.
- » **Premier plan:** This support tier is aimed at businesses that want not only lightning-fast technical support but also architectural guidance from Microsoft Azure solutions experts. You need to contact Microsoft to get a Premier plan price quote.



REMEMBER

Unless you have an EA with Microsoft, you can cancel your Azure subscription at any time. Be aware, however, that you're required to delete all your resources before Microsoft will let you cancel the subscription.