LEARNING MADE EASY

2nd Edition

Microsoft® Azure®

for dummies®

A Wiley Brand

Get a roadmap to core Azure services

Discover how to migrate to Azure with ease

Apply the latest security to keep your data private

Jack Hyman

Author of *Microsoft Power BI For Dummies*

Microsoft® Azure®

2nd Edition

by Jack Hyman

for dummies®
A Wiley Brand

Microsoft® Azure® For Dummies®, 2nd Edition

Published by: **John Wiley & Sons, Inc.,** 111 River Street, Hoboken, NJ 07030-5774, www.wiley.com

Published simultaneously in Canada

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: WHILE THE PUBLISHER AND AUTHORS HAVE USED THEIR BEST EFFORTS IN PREPARING THIS WORK, THEY MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES REPRESENTATIVES, WRITTEN SALES MATERIALS OR PROMOTIONAL STATEMENTS FOR THIS WORK. THE FACT THAT AN ORGANIZATION, WEBSITE, OR PRODUCT IS REFERRED TO IN THIS WORK AS A CITATION AND/OR POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE PUBLISHER AND AUTHORS ENDORSE THE INFORMATION OR SERVICES THE ORGANIZATION, WEBSITE, OR PRODUCT MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING PROFESSIONAL SERVICES. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR YOUR SITUATION. YOU SHOULD CONSULT WITH A SPECIALIST WHERE APPROPRIATE. FURTHER, READERS SHOULD BE AWARE THAT WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ. NEITHER THE PUBLISHER NOR AUTHORS SHALL BE LIABLE FOR ANY LOSS OF PROFIT OR ANY OTHER COMMERCIAL DAMAGES, INCLUDING BUT NOT

LIMITED TO SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002. For technical support, please visit https://hub.wiley.com/community/support/dummies.

Wiley publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at http://booksupport.wiley.com. For more information about Wiley products, visit www.wiley.com.

Library of Congress Control Number: 2022948948

ISBN 978-1-119-89806-1 (pbk); ISBN 978-1-119-89807-8 (ebk); ISBN 978-1-119-89808-5 (ebk)

Microsoft® Azure® For Dummies®

To view this book's Cheat Sheet, simply go to www.dummies.com and search for “Microsoft Azure For Dummies Cheat Sheet” in the Search box.

Table of Contents

List of Tables

Chapter 13

Chapter 14

Chapter 17

List of Illustrations

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Chapter 8

Chapter 9

Chapter 10

Chapter 11

Chapter 12

Chapter 13

Chapter 14

Chapter 15

Chapter 16

Introduction

Microsoft Azure is a public cloud service in which you rent compute services from Microsoft that run in Microsoft's data centers. You pay only for the resources you use over the course of your billing period.

Microsoft Azure For Dummies is intended to provide you with a gentle yet thorough introduction to Microsoft Azure. In this updated second edition, I cover the must-know features you are likely to encounter as you begin the Azure journey. I show you how things work and why it makes sense to use specific features. Undoubtedly, cloud computing can be complex at first, but it also has the potential to save you or your organization money, time, and effort.

About This Book

Many books on Microsoft Azure have been published, yet most cover laser-focused areas: analytics, security, machine learning, systems administration, app development, and so on. And certification texts generally cover just enough to pass a focused exam and are not a general reference on all core Azure capabilities. With the constant feature rollouts in the Azure platform, it can be hard to keep up, which is why in this edition of *Microsoft Azure For Dummies,* I cover the new features and those that have undergone drastic change since the first edition of this book was published in 2019.

I've worked with Azure for close to a decade. Here's a bit of a secret: Whether you are the most experienced Azure Cloud Engineer or just starting out, you'll experience some technical challenges every now and then. Even

Microsoft Most Valued Professionals (MVPs) find it labor-intensive to stay current with the constant changes introduced by the Azure product management team.

Thus, I wrote this book with the intention of helping you with the following:

- **Becoming comfortable with Microsoft Azure:** I give you this comfort by sticking to what Microsoft calls the "80 percent scenarios," or Azure deployments used by 80 percent of its customer base.
- **Gaining skill with programmatic deployment:** Along the way, I show you how to use Azure PowerShell, Azure Command-Line Interface (CLI), and Azure Resource Manager (ARM) templates to get your Azure work done. These Azure access methods change less frequently than the Azure portal graphical user interface (GUI).
- **Becoming comfortable with tools and staying current:** You can expect the Azure portal to change such that what you see on your screen may not match what's in this book. Why is that? Because no two Azure users deploy the same resources or configure their user experience the same way. So don't be alarmed! I updated both chapters in Part 6 of the book ("The Part of Tens") to help you plan for the future of Azure and how to optimize your environment.

In addition, I include many web addresses throughout this book. If Microsoft changes a page address and the link I provide no longer works, don't fret! Simply run a Google search for the article title and you'll find the updated page address nearly instantly.

Throughout this book, you'll also find dozens of step-by-step procedures. I want you to keep the following points

in mind as you work through them:

- You need an Azure subscription to follow the steps. If you haven't already done so, you can create a free Azure account (https://azure.microsoft.com/free) that gives you 30 days to spend $200 USD on any Azure service. This quota should get you through this book's material as long as you delete your deployments when you finish using them.
- I often provide sample values that work in my environment but may not be supported in yours based on geography and resources utilized. You should customize these procedures to suit your requirements.
- You'll likely need a few additional tools along the way. All of these tools are available from the Microsoft website as *Azure utilities*.

Finally, most of the Azure administration and development tools discussed are available for Windows, macOS, and Linux. (I'm using a Windows 10 or 11 Enterprise workstation.)

Foolish Assumptions

I wrote this book with several types of readers in mind. See whether you can place yourself roughly or exactly in any of the following descriptions:

- You're an experienced IT professional who may or may not already be using Azure for future initiatives at work.
- You might be preparing for an Azure certification.
- You're an IT newcomer who wants to know Azure to future-proof your career.

- You're proficient in other public cloud platforms, such as Amazon Web Services or Google Cloud Platform, and you want to see how Azure compares.
- You need a quick reference, not a hundred Azure books, to lead you in the right direction for business and technical success.

Regardless of your present attitude and orientation toward Azure, I hope that by studying this book and applying its methods you become more knowledgeable about Azure and thereby excel in your profession.

Icons Used in This Book

If you've read a *For Dummies* book before, then you're probably familiar with the icons. If not, or if you want a formal description of each, then read on!

The Tip icon marks tips (duh!) and shortcuts that you can use to make working with Azure easier.

Remember icons mark especially important information. To siphon off the most important information in each chapter, skim the paragraphs that have these icons.

The Technical Stuff icon marks information of a highly technical nature. You'll be digging into the weeds a bit more. You can skip if you like, though!

WARNING The Warning icon tells you to watch out! It marks important information that may save you headaches.

ON THE WEB When you see the On the Web icon, it points to valuable Azure-related websites. Most of these URLs direct you to more detailed information on the Microsoft website.

Beyond the Book

Beyond what's included between the covers of this book, I created a Cheat Sheet that includes tips, tricks, and shortcuts for the Azure services you use over the course of the book. You can find the Cheat Sheet and other information related to this book (such as errata) by visiting https://www.dummies.com and searching for "Azure For Dummies" in the search box.

Where to Go from Here

Although I'd read this book in order starting with Chapter 1, you may not prefer to use that method. You can dip into any chapter with no formal dependency on those that come before it, so flip to the chapter that you want to begin with and let's get to work!

Part 1

Getting Started with Microsoft Azure

IN THIS PART ...

- Figuring out exactly what “cloud computing” means and how Microsoft Azure fits into the cloud computing picture
- Differentiating the different cloud computing deployment and service delivery models
- Exploring the Azure Subscription Models
- Understanding the basics of Azure Resource Manager and Azure Regions
- Gaining familiarity with the Microsoft Azure script and UI-based administrative tools

Chapter 1

Introducing Microsoft Azure

IN THIS CHAPTER

- **Introducing the cloud**
- **Differentiating among the cloud computing models**
- **Introducing the major Microsoft Azure services**
- **Starting your Azure subscription**
- **Learning how Azure deploys product updates**

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?

Ask one hundred people to define cloud computing and I am confident the responses may make you laugh, cry, or think a bit. You see, many people at first think cloud technology is anything but shared compute capacity and resources using a common interface.

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 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? How about accessing that digital video service or music heard over the Internet?

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:** Cloud customers can provision services at any time and are charged only for the resources they consume.
- **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.