**Preface**

Edge computing as we know it has rapidly evolved from its early days as a successor to the **Internet of Things** (**IoT**). Processing data at the source has become the ultimate goal because businesses and people expect analytics insights to be available and transaction results to be cleared in real time. That includes medical analysis, money transfers, payment receipts, video inferencing, and voice recognition. All this is possible because devices have become “smart” and the communication networks are able to deliver high speed and high throughput with low latencies to these new deployments. We have seen the rise of a new paradigm of application architecture specifically designed to run in domains that are not only constrained but also widely distributed. The IT architectures facilitating these advancements are unique because of the very nature of edge computing.

If the name of the game is to get insights quickly from all the data, we have to ensure there are applications able to do that, devices that can host the applications, and a network facilitating the information flow. That is the challenge solution architects face, which is who this book is primarily written for.

Drawing from real-world deployments in large enterprises and standards proposed by edge computing community organizations, this book emphasizes practical and tested-at-scale patterns and best practices used by leading companies worldwide. The book takes the reader from edge computing terminology and concepts to simple architectures, and eventually through end-to-end industry-specific approaches. It gives several points of view and rules of thumb and provides resources and recommendations for deeper thinking and research.

**Who this book is for**

This book is intended for IT professionals who have created solution architectures and are looking to extend their skills to the edge computing space. It should be valuable to VPs of IT infrastructure, enterprise architects, solution architects, and SRE professionals who are familiar with cloud computing and are interested in creating an edge reference architecture or a solution architecture for a particular industry use case. The book provides common patterns from solutions implemented by customers in industries ranging from retail to telcos to manufacturing.

**What this book covers**

[*Chapter 1*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_01.xhtml#_idTextAnchor013), *Our View of Edge Computing*, establishes a shared vernacular, describes infrastructure scenarios, and relies on industry conventions to ensure standard and widely compatible solutions.

[*Chapter 2*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_02.xhtml#_idTextAnchor036), *Edge Architectural Components*, covers four roles of components in edge architectures, benefits and limitations, and functional versus non-functional requirements.

[*Chapter 3*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_03.xhtml#_idTextAnchor057), *Core Edge Architecture*, covers managing and enabling sensors and smart devices using the Edge Device Hub pattern.

[*Chapter 4*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_04.xhtml#_idTextAnchor073), *Network Edge Architecture*, explores transitioning to software-defined network architectures to enable digital service provider scenarios.

[*Chapter 5*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_05.xhtml#_idTextAnchor091), *End-to-End Edge Architecture*, brings together devices, macro components, and applications to solve industry-specific challenges.

[*Chapter 6*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_06.xhtml#_idTextAnchor110), *Data Has Weight and Inertia*, explores the data-related considerations that edge-native solutions will need to address.

[*Chapter 7*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_07.xhtml#_idTextAnchor131), *Automate to Achieve Scale*, includes approaches that have worked at the extreme scales that edge deployments may encounter.

[*Chapter 8*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_08.xhtml#_idTextAnchor152), *Monitoring and Observability*, covers how to ensure that a deployed edge solution is performing as designed, despite unique challenges.

[*Chapter 9*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_09.xhtml#_idTextAnchor172), *Connect Judiciously but Thoughtlessly*, covers three connection scenarios and how application-centered approaches can address them.

[*Chapter 10*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_10.xhtml#_idTextAnchor190), *Open Source Software Can Benefit You*, explores strategies for ensuring that open source dependencies are used optimally, and when and how an enterprise should open source their solutions.

[*Chapter 11*](https://learning.oreilly.com/library/view/edge-computing-patterns/9781805124061/B21141_11.xhtml#_idTextAnchor208), *Recommendations and Best Practices*, takes a wider view of the problem space and how thinking deeply about what you are doing and why can yield some surprising insights.

**Images used in the book**

You can find the images used in this book in the GitHub repository at <https://github.com/PacktPublishing/Edge-Computing-Patterns-for-Solution-Architects>.

**Conventions used**

There are a number of text conventions used throughout this book.

**Code in text**: Indicates code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles. Here is an example: “If you notice closely, it is an Open Horizon environment variable, namely **HZN\_DEVICE\_ID**.”

A block of code is set as follows:

#!/bin/sh

# Simple edge service

while true; do

    echo "HZN\_DEVICE\_ID says: Hello from Packt!"

    sleep 5

done

**Bold**: Indicates a new term, an important word, or words that you see onscreen. For instance, words in menus or dialog boxes appear in **bold**. Here is an example: “The following code snippet is a very simple Hello World service that outputs **Hello from Packt** every five seconds.”

*TIPS OR IMPORTANT NOTES*

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