IoT 301: Mastering IoT development

An advanced developer guide for IoT

Anna Gerber

January 03, 2018
(First published December 22, 2017)

Master your IoT development skills with this developerWorks advanced developer guide. IoT 301 is for application developers who are using Internet of Things technologies to extend and enhance their innovative IoT apps.

In the first learning path, IoT 101: Getting started with IoT development, you were introduced to the key concepts and skills you need to build IoT solutions. In the previous learning path, IoT 201: Building skills in IoT development, you dug a little deeper into developing innovative IoT systems. In this IoT 301 learning path, you'll put all the pieces together and begin mastering some of the more advanced capabilities of IoT solutions.

In this IoT 301 learning path, you first discover the top security challenges for IoT solutions. Next, you learn how to make sense of all the data generated by your IoT devices. Then, you learn about IoT device management. Finally, this IoT 301 learning path culminates in a video-based tutorial where you extend the IoT project, — a healthy habits tracker, that you built at the end of the previous IoT 201 learning path.

1. Discover the next layer of detail in IoT development

IoT will transform most industries and applications and deliver benefits of operational efficiencies so long as the IoT systems address security, device management, and analytics.

> *“ In my final learning path, I’ll help you tackle some of the most challenging issues that face developers: security, device management, and analytics. ”*

Start your learning here by reading this introductory blog:

- **Getting serious about IoT development**

2. Top 10 IoT security challenges

Ask any developer or any executive about what their most concerned about IoT development, and most likely they will say just one thing: security. Security for the devices, for the network, for the communication, and for the data.

> *“ Adopting a multi-layered security-by-design approach to IoT development is essential for securely managing devices, data, and mobile and cloud-based IoT apps and services, as well as dealing with threats or issues as they arise. ”*

Explore the complex world of IoT security in this blog:

- **Top 10 IoT security challenges**

3. Managing your IoT devices

Your IoT architecture must consider and outline any IoT device management capabilities. Dealing with constrained devices, and dealing with a large number and variety of those devices, is just part of the device management picture. Interoperability, scalability, and availability all come in to play as well.

> *“ Device management services help to automate the management of IoT devices throughout their lifecycle - including provisioning, authentication, configuration, maintenance operations, monitoring, and eventually decommissioning. Device management is a critical component for any scalable, secure and interoperable IoT solution. ”*

Learn about IoT device management in this article:

- **Managing your IoT devices**

4. Storing, analyzing, and applying rules to act on your IoT data

The reason that most often IoT solutions fail is because they don't actually *do* something with all the data that they generate. You can't just store the data; you can't just analyze the data; you have to take action on your data. That's when your IoT solution is successful.

> *“ Data analytics can be applied to IoT data to generate dashboards, reports, visualizations, and alerts, to monitor the health and status of connected devices, and to provide visibility for sensor readings. Analytics are used to identify patterns, detect anomalies, and predict outcomes from the data, as well to trigger actions through the application of rules. ”*

Learn about what to do with your IoT data in this article:

- **Making sense of IoT data**

5. Master your IoT development skills

This tutorial picks up where my previous tutorial left off, showing you how to extend the IoT system to implement device management actions on the IoT device, how to do basic visualizations on the device data, and how to create rules to trigger actions that make use of the device data.

If you're serious about mastering your IoT development skills, and learning about device management and analytics in context, complete this tutorial:

- **Master your IoT development skills by extending an IoT system**

What's next?

We can't wait to hear about the innovative IoT apps that you'll build after reading and completing all the blogs, articles, and tutorials in the three learning paths, **IoT 101**, **IoT 201**, and **IoT 301**. Keep exploring all the other great developerWorks IoT content.

Related topics

- IoT articles and tutorials on developerWorks
- Hands-on IoT videos on developerWorks TV
- All IoT videos on developerWorks TV
- Community-contributed tutorials on developerWorks Recipes
- IoT courses for developers
- IBM Watson IoT Platform Developer Center