**IoT Device Management**

**Beginner - Target Topic - IoT**

**Course Overview:**

The IoT Device Management target topic is designed to teach students the main concepts around managing IoT devices at scale. The course begins with the key principles of IoT device management like automation and context awareness, and then continues with device lifecycle management. The course concludes with an examination of device twins and patterns for device management.

**Prerequisites:**

*General experience navigating within the AWS Management Console is helpful but not required.*

**Audience:**

*Engineers and developers looking to increase their knowledge around IoT device management.*

**Purpose:**

*Gain a deeper understanding of how IoT devices are managed at scale.*

**Course Duration:** 90 minutes

**Productivity Objectives:**

Upon completion of this course, you should be able to:

* Explain the key principles of IoT device management
* Describe the IoT device lifecycle
* Define device twins and shadows
* List the patterns for device management in IoT

**Course Outline:**

* Key principles
  + Scale & Automation
  + Openness & Compatibility
  + Context Awareness
  + “Service Many Roles”
* Device lifecycle
  + Plan
  + Provision
  + Configure
  + Monitor
  + Retire
* Device twins or shadows
* Patterns for device management in IoT – reboots, firmware upgrades, and monitoring
* IoT Device Management demo

**Role:**

*System Administrator*

*Software Developer*

**IoT Data Management**

**Beginner - Target Topic - IoT**

**Course Overview:**

The IoT Data Management target topic is designed to teach students the principles of managing IoT device data at scale. The course begins with a look at device telemetry and IoT communications protocols like MQTT and AMQP. The course then describes the stages of data management within IoT and explains how machine learning and artificial intelligence are used with IoT devices. The course concludes with an examination of the difference between monitoring and control.

**Prerequisites:**

*General experience navigating within the AWS Management Console is helpful but not required.*

**Audience:**

*Engineers and developers looking to increase their knowledge around IoT data management.*

**Purpose:**

*Gain a deeper understanding of how IoT device data is managed at scale.*

**Course Duration:** 90 minutes

**Productivity Objectives:**

Upon completion of this course, you should be able to:

* Describe device telemetry
* Explain the different IoT communications protocols
* Understand how and why MQTT is used
* List the stages of data management within IoT
* Describe how machine learning and artificial intelligence are used with IoT data
* Differentiate between monitoring and control

**Course Outline:**

* Device telemetry
* IoT communications protocols (MQTT/AMQP)
* MQTT deeper dive
* Stages of data management within IoT
  + Ingestion
  + Scrubbing & normalization
  + Aggregation
  + Analysis & intelligence gathering
* Leveraging Machine Learning & AI to gain intelligence from the data
* Monitoring vs. control
* IoT Data Management demo

**Role:**

*System Administrator*

*Software Developer*

**IoT Security & Compliance**

**Beginner - Target Topic - IoT**

**Course Overview:**

The IoT Security & Compliance target topic is designed to teach students the security risks associated with IoT devices and data. The course begins with a look at the standards and compliance categories in IoT as well as how to assess security risks. The course continues with a look at the typical threat zones within IoT as well as how to secure device identity, software, hardware and data both at rest and in motion. The course concludes with a look at threat modeling.

**Prerequisites:**

*General experience navigating within the AWS Management Console is helpful but not required.*

**Audience:**

*Engineers and developers looking to understand security and compliance in the IoT space.*

**Purpose:**

*Gain a deeper understanding of how security and compliance fit in with IoT devices and data.*

**Course Duration:** 90 minutes

**Productivity Objectives:**

Upon completion of this course, you should be able to:

* Understand the security risks associated with IoT devices and data
* Describe the typical threat zones within IoT
* Explain how to secure device identity, software and hardware
* Use threat modeling techniques with IoT

**Course Outline:**

* Standards & compliance categories
* Assessing security risks
* Typical threat zones within IoT
* Securing and confirming device identity
* Securing device software
* Securing device hardware
* Security of data at rest and in motion
* Threat modeling
* IoT Security & Compliance demo

**Role:**

*System Administrator*

*Software Developer*

**IoT Operations**

**Beginner - Target Topic - IoT**

**Course Overview:**

The IoT Operations target topic is designed to teach students what it takes to manage IoT at scale. The course begins with a look at the common metrics for IoT and how they are measured and assessed. The course continues with a look at performance at scale as well as business-centric strategies for scaling IoT. The course concludes with a look at how DevOps and DevSecOps fit in to IoT operations.

**Prerequisites:**

*General experience navigating within the AWS Management Console is helpful but not required.*

**Audience:**

*Engineers and developers looking to understand operations at scale in the IoT space.*

**Purpose:**

*Gain a deeper understanding of what it looks like to operate IoT initiatives at scale.*

**Course Duration:** 90 minutes

**Productivity Objectives:**

Upon completion of this course, you should be able to:

* List the common metrics for IoT and how they are measured and assessed
* Describe how to achieve performance at scale
* List some business-centric strategies for scaling IoT
* Explain how DevOps and DevSecOps fit into the IoT operations

**Course Outline:**

* Metrics, measurement, and assessment
* Performance at scale
* Business-centric strategies for scaling IoT
* DevOps & automation
* DevSecOps – “shifting security left”
* IT (Information Technology) and OT (Operational Technology) convergence
* IoT Operations demo

**Role:**

*System Administrator*

*Software Developer*