IoT Security and Privacy

AWS IoT

Instructions:

1. Note: Blue text points to a web link. Ctrl + Click to follow link.
2. This is a team assignment. However, each member of the team has to submit the finished assignment. Those who do not submit will get zero for this assignment.
3. Answers to all questions must be put into **ONE** document. That is, every time, each student can only submit one report document, answering all questions of this assignment.
4. Students must put answers following each question in this assignment. The instructor will not grade a report with only answers in it and the student gets zero for such an assignment. An assignment report must include original questions.
5. Students MUST submit the finished assignment in either Microsoft Word or pdf format to Blackboard. The doc must be submitted as ONE standalone file and cannot be tarred or zipped into a container.
6. Refer to Print screen on how to take a screenshot. Pressing the Alt key in combination with PrtSc will capture the currently selected window.

Review questions

1. Amazon AWS IoT basically sets up a server such as a MQTT server so that physical IoT devices and applications can use the server to communicate with each other. (Yes/No)

2. Rules engine of AWS IoT directs data to other AWS services such as Amazon S3, Amazon DynamoDB, and AWS Lambda. (Yes/No)

3. Thing Registry (Device Registry) stores virtual devices in the cloud, corresponding to physical things. (Yes/No)

4. Thing Shadows service synchronizes states requested by users and at the physical devices. (Yes/No)

5. Client authentication of AWS IoT supports certificate authentication like the one used by SSH. (Yes/No)

Lab 1 (Needs instructional support)

In this lab, students are required to connect Raspberry Pi to Amazon AWS IoT and update the state of the connected sensor continuously with the AWS IoT thing shadow. The data such as the state generated by the sensor should be written into Amazon DynamoDB. Note: be careful not to

exceed the free account quota of data for AWS IoT. Please refer to the references [1][3][4][5][6][7][8][8], particularly [1], if necessary for this assignment.

Requirements:
1. Document in detail the procedures connecting Raspberry Pi to Amazon AWS IoT. (3 points)

2. Document in detail the procedures updating the state of the connected sensor continuously with the AWS IoT thing shadow. (3 points)

3. Document in detail the procedures writing sensor data into Amazon DynamoDB. (3 points)

4. Post the code for this assignment into this report. (1 point)

References:
[1] Chao Gao, Amazon AWS IoT, 2016
[2] AWS IoT developer guide, 2016
[3] Onur ŞALK, Amazon Web Services IoT, November 02, 2015
[4] Get Started with AWS IoT and Raspberry Pi, Oct. 18, 2015
[5] AWS January 2016 Webinar Series - Getting Started with AWS IoT, Youtube, Jan 26, 2016
[6] AWS Identity and Access Management User Guide, 2016
[7] paho-mqtt 1.1, 2016
[8] Introducing JSON, 2016