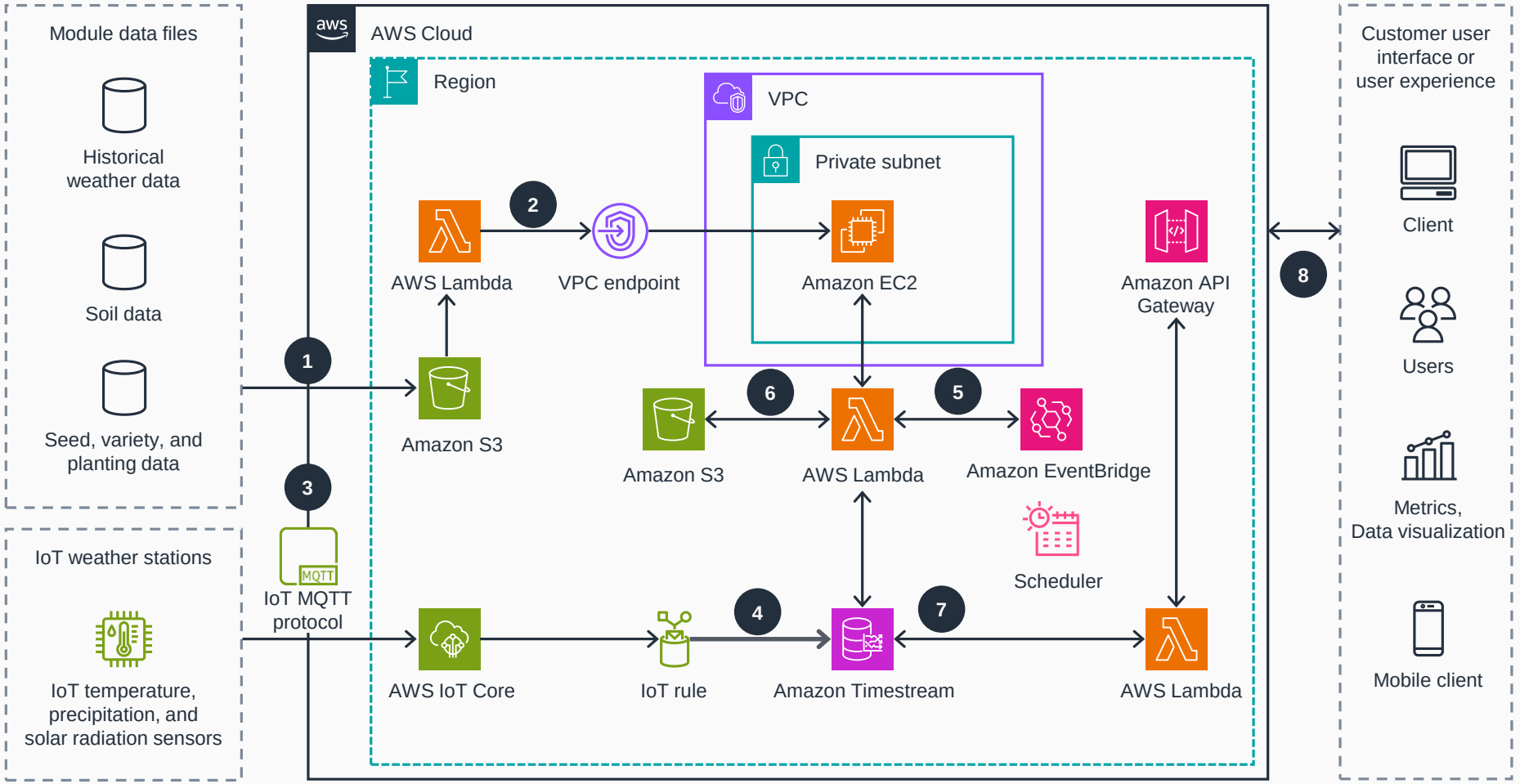
Guidance for Crop Growth Simulation Models using DSSAT on AWS

This architecture diagram shows how to simulate crop growth, nitrogen balances, and crop yields using DSSAT on AWS.



1. Load farm data into **Amazon Simple Storage Service (Amazon S3)** using DSSAT version 4.8.
2. **Amazon S3** invokes an **AWS Lambda** function, which will load the farm data into the DSSAT application directory in **Amazon Elastic Compute Cloud (Amazon EC2**) **for Microsoft Windows Server** using a virtual private cloud (VPC) endpoint.
3. Gather field-centric weather data from Internet of Things (IoT) weather stations that use **AWS IoT** libraries. Send the data to **AWS IoT Core** through message queuing telemetry transport (MQTT).
4. Configure an **AWS IoT** rule to insert the weather station data into **Amazon Timestream**.
5. **Amazon EventBridge** schedules a **Lambda** function to query, format, and save **Timestream** data into **Amazon S3** and into **Amazon EC2** for use in the crop simulations.
6. Invoke a separate, scheduled **Lambda** function to run the crop simulations through DSSAT and move the output prediction files into **Amazon S3** for long-term storage.
7. The scheduled **Lambda** function also parses and inserts the crop prediction data into **Timestream** tables.
8. Use **Amazon API Gateway** to invoke a **Lambda** function with logic to return crop prediction data and load it into your application for display and use.

Reviewed for technical accuracy September 18, 2023

AWS Reference Architecture