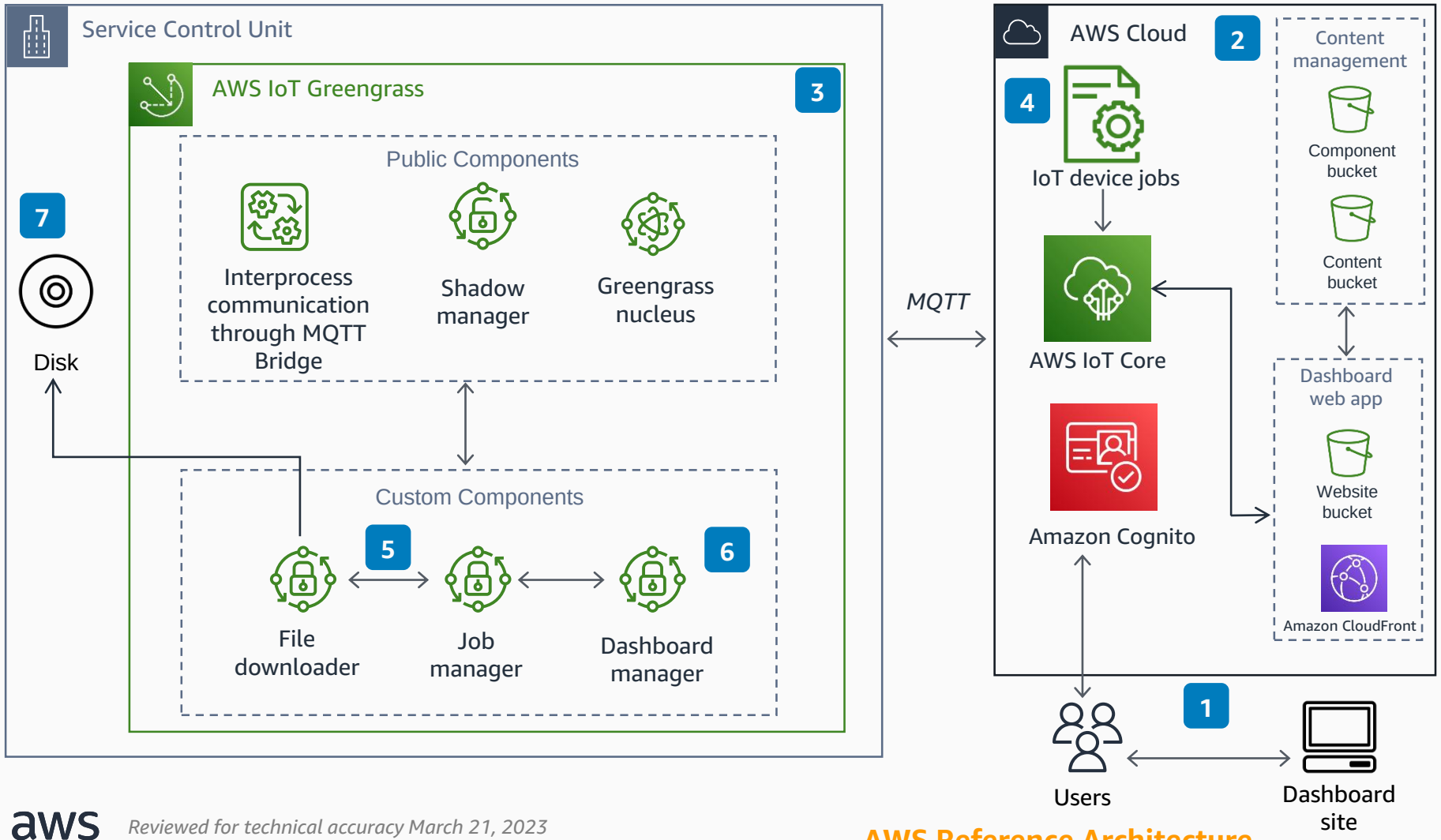
Guidance for Connected Aircraft Performing Over-the-Air Updates Using AWS Greengrass

This architecture shows how digital content can be updated on airplanes during flight using over-the-air technology.



AWS Reference Architecture

1. Administrators can access a web-based dashboard, hosted on **Amazon Simple Storage Service** (Amazon S3), protected by **Amazon Cognito** and **Amazon CloudFront**, a content delivery network (CDN), to define which content should be transferred to which airplanes.

2. When developers or administrators build custom components to run on **AWS IoT Greengrass,** or content to be moved to the Service Control Unit (SCU), the compute system on the airplane, it is placed in the appropriate **Amazon S3** bucket.

3. **AWS IoT Greengrass** leverages Interprocess Communication (IPC) and Shadow Management to transfer and manage the content. This transfer is done through MQ Telemetry Transport (MQTT), the machine to machine network protocol.

4. **IoT Device Job** commands are sent as JSON documents to one of more groups of SCUs. These documents are synced from AWS to the airplane and managed by **AWS IoT Core**.

5. The **Job manager** component receives jobs and initiates file downloads by triggering the **File downloader** component through the **IPC.** This causes file(s) to be downloaded from the appropriate **Amazon S3** bucket.

6. The **Dashboard manager** custom component informs the dashboard on download progress and handles pause/resume commands through **Shadow manager**.

7. The SCU updates applications and makes content available to passengers or staff.

Reviewed for technical accuracy March 21, 2023