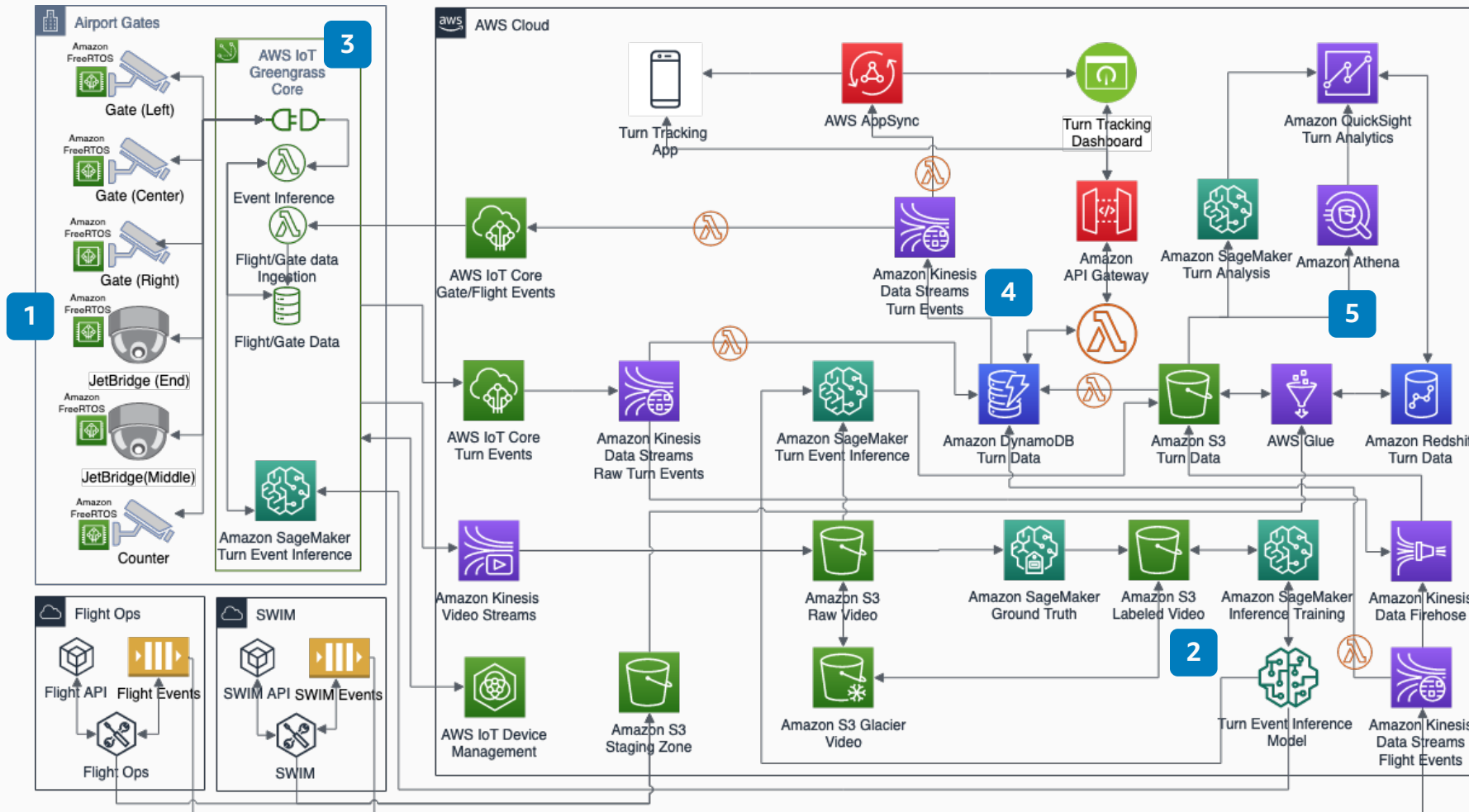


Aircraft Turn Tracking

Passive Data Collection of Discrete Aircraft Turn Events at the Airport Gate

Use Amazon Web Services (AWS) tools and technologies to capture turn events, analyze turn data, and provide dashboards, tracking tools, and events. Camera usage and computer vision allows for consistent and accurate tracking of the discrete turn events.



1 Gate cameras: Three cameras placed outside looking at the aircraft provide coverage for all the turn events happening on the tarmac. **Jet bridge cameras:** Two cameras on the jet bridge provide coverage for the boarding turn events. **Gate counter camera:** One camera at the gate counter provides coverage for the crew and agent arrival at the gate.

2 To perform inference training, the cameras are installed at one or two gates and the video stream recorded for 4 to 6 weeks. This recording is used to tune and train **Amazon SageMaker** to generate turn events. **Amazon SageMaker Ground Truth** labels the turn events in the training video feeds.

3 **AWS IoT Greengrass**, **AWS IoT Core**, and **AWS IoT Device Management** manage the cameras and run inference on the edge with **AWS Lambda** and **Amazon SageMaker**.

4 Use purpose built databases and serverless architecture to deliver microservices and events for operational data store. **Amazon DynamoDB**, **Amazon Kinesis**, **AWS Lambda**, **Amazon API Gateway**, and **AWS AppSync** provides the capabilities required for the real-time microservices, notification and events to build mobile apps and dashboards.

5 **Amazon S3**, **Amazon Redshift**, and **Amazon QuickSight** provide the data lake and analytics platform for the solution. With **Amazon SageMaker**, you can build AI/ML models for turn optimization. **Amazon Athena** can be used for ad-hoc data analysis on the turn data lake.

Airlines/airports can realize cost savings by improving the turn cycle time and reducing the turn variation time of an aircraft at the gate. Reducing cycle time frees aircraft and gates for more efficient usage in the schedule. Reducing variation in turn time reduces delays and cancellations downstream. Reducing cycle time by 4-6 mins can be calculated to potentially freeing up to 2-3% of the fleet of around 500 aircraft. With aircraft costing \$3-5M per year, this may result in cost savings of \$30-75M for a fleet size of 500 aircraft. Without Turn Tracking, these cost savings are difficult to capture. With Turn Tracking, the airline/airport can implement the six sigma process to realize the cost savings.

