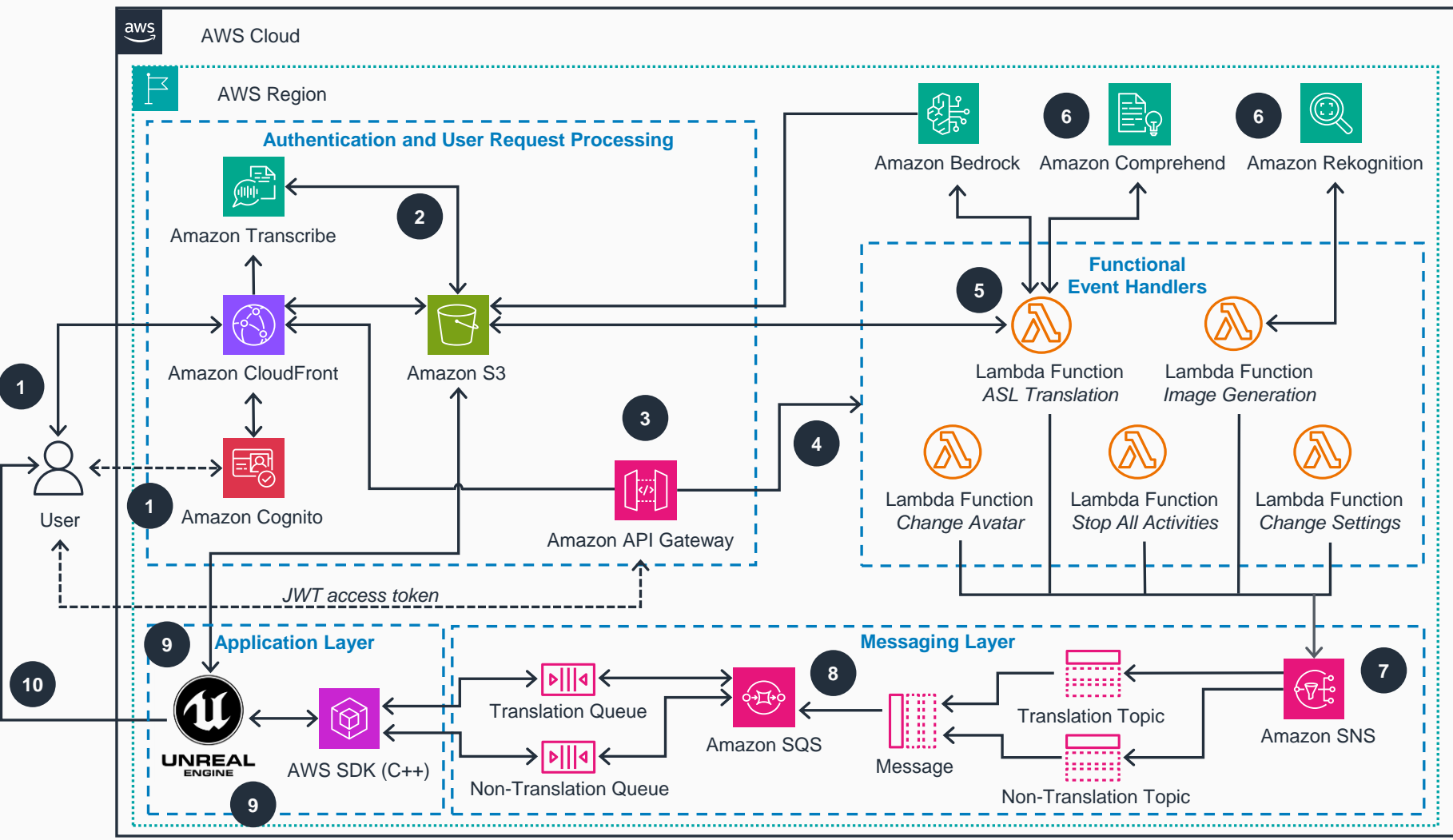


Guidance for American Sign Language (ASL) 3D Avatar Translator on AWS

This architecture diagram uses event-driven messaging to enable the translation of multi-lingual phrases into ASL through a 3D avatar in Unreal Engine.



- 1 User authenticates to **Amazon Cognito** using an **Amazon CloudFront**-hosted website or web API (through **Amazon Cognito**-based JWT access token).
- 2 User types or speaks an input phrase in a chosen language, which **Amazon Transcribe** transcribes. Transcription is stored in an **Amazon Simple Storage Service (Amazon S3)** bucket.
- 3 User requests an action (like ASL translate, change avatar, or change background image) through the website or web API (**Amazon API Gateway** endpoint).
- 4 Based on the user-requested action, **API Gateway** routes its request to a corresponding **AWS Lambda** function for processing that action.
- 5 For ASL Translation requests, a matching **Lambda** function invokes **Amazon Bedrock** to form an ASL phrase for the provided input phrase and to obtain a contextual 2D image (to be stored in an **S3** bucket).
- 6 **Amazon Comprehend** and **Amazon Bedrock** perform multi-lingual toxicity checks on the input phrase. **Amazon Rekognition** performs visual toxicity checks on 2D-generated images. Toxicity check results are returned to respective **Lambda** functions.
- 7 All **Lambda** functions generate a JSON-based payload to capture a user-requested action for **Epic Games Unreal Engine**. Each payload is sent to a corresponding **Amazon Simple Notification Service (Amazon SNS)** topic: Translation and Non-Translation.
- 8 Each **Amazon SNS**-based payload is transmitted to its corresponding **Amazon Simple Queue Service (Amazon SQS)** queue for later consumption by Unreal Engine.
- 9 Using the **AWS SDK**, the Unreal Engine application polls and dequeues **Amazon SQS** action-based payloads from its queues. Background images are fetched from an **S3** bucket for translation requests.
- 10 Based on each payload received, the Unreal Engine application performs a user-requested action and displays resulting video output on that user's system. This output provides an ASL-equivalent interpretation of an input phrase by displaying a **MetaHuman** 3D avatar animation with ASL-transformed text displayed.