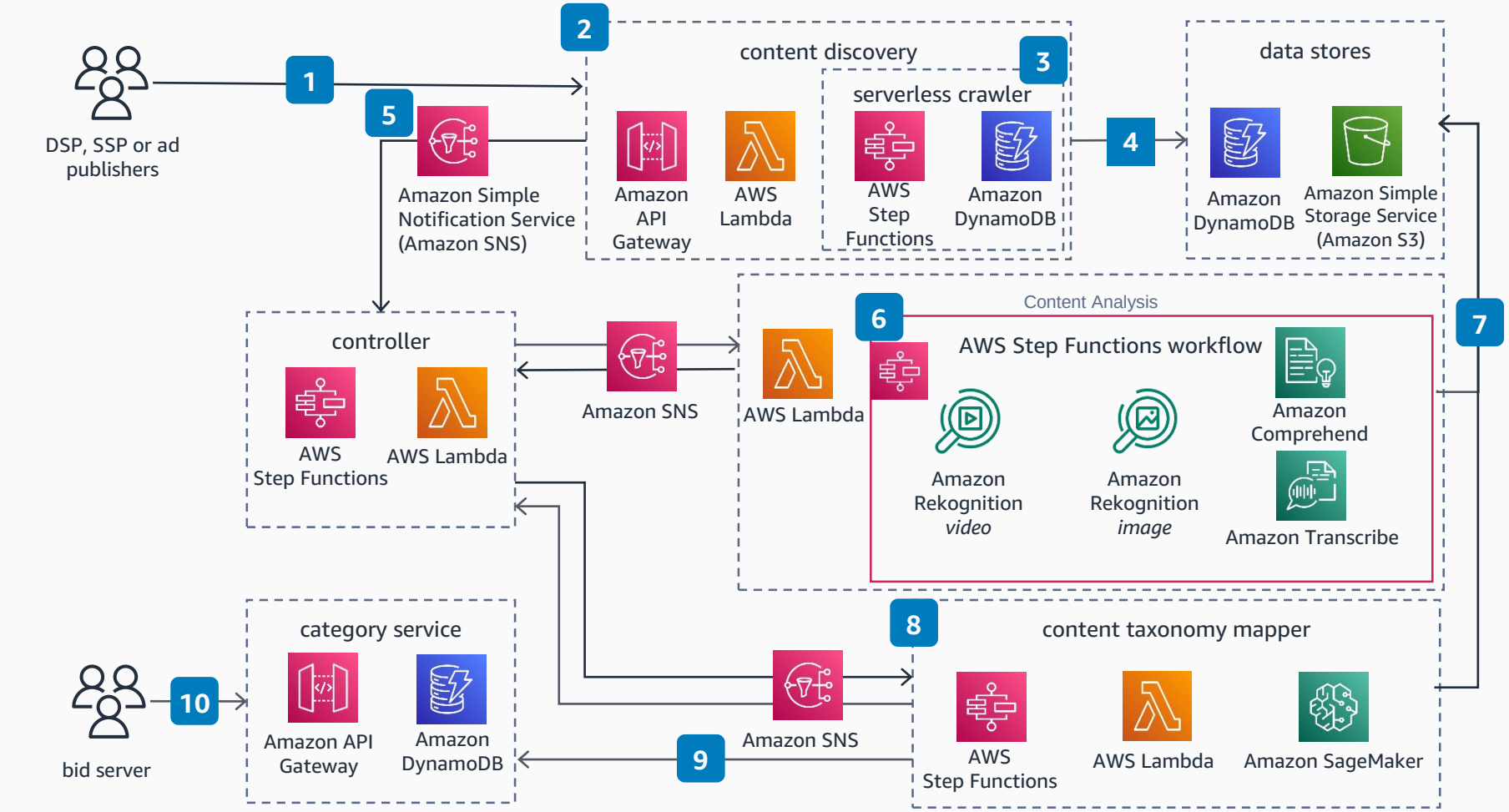
Guidance for Contextual Intelligence for Advertising

This is a contextual advertising solution with enhanced machine learning (ML) capabilities, designed to reach target audiences without using third party cookies. Contextual advertising enables advertisers to reach an audience based on the content consumed by users. It uses an event-driven serverless architecture based on a highly scalable and cost-optimized design. It enables demand side platforms (DSPs), advertisement publishers and supply side platforms (SSPs) to build a contextual intelligence solution utilizing AWS artificial intelligence (AI) and machine learning services to extract relevant metadata and map it to their own taxonomy or industry-standard taxonomy, which informs the programmatic bids for advertisement publishers, brand safety for advertisers and advertisement creative classification for supply side platforms.



1. DSP, SSP or ad publishers invoke an API on **Amazon API Gateway** to trigger content discovery to fetch text, images, audio, and video from the provided content.
2. Customers can use either a crawler or content management system API to extract different media types and store them in an **Amazon S3** bucket.
3. The serverless crawler is built on **AWS Step Functions** to orchestrate exploration and download of content. Ephemeral discovery data is stored in **Amazon DynamoDB**.
4. Content (text, image, video) is stored in **Amazon S3** and available metadata in **Amazon DynamoDB** for analysis.
5. Content discovery completion event starts controller orchestration built on **AWS Step Functions**, **AWS Lambda**, and **Amazon SNS**.
6. **Amazon SNS** events invoke **AWS Lambda** functions to start content analysis using **Amazon Comprehend**, **Amazon Rekognition**, and **Amazon Transcribe**.
7. **Amazon DynamoDB** stores topics, sentiment, and object labels from content analysis workflow.
8. Contextual Intelligence Taxonomy Mapper (CITM) uses the Bidirectional Encoder Representations from Transformers (BERT) model deployed on **Amazon SageMaker**. CITM maps metadata in **Amazon DynamoDB** to an industry standard taxonomy such as IAB Content Taxonomy.
9. The **AWS Lambda** function gets the mapping and stores it in **Amazon DynamoDB** within the category service.
10. Bidding servers invoke API built on **Amazon API Gateway** to fetch categories from **Amazon DynamoDB** to inform programmatic advertising bids with low latency.

Reviewed for technical accuracy April 6, 2022

AWS Reference Architecture