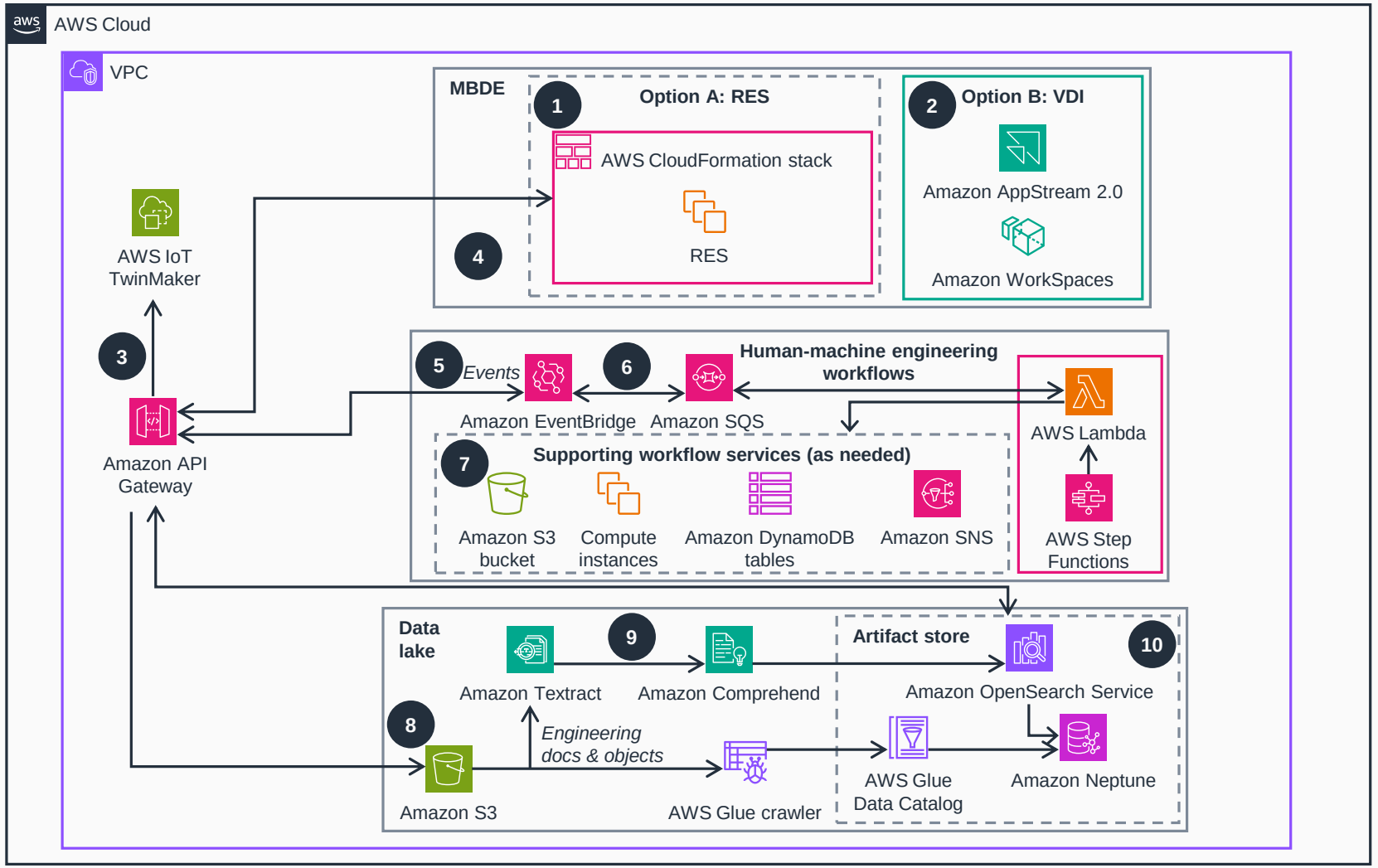
Guidance for Model-Based Design Environment (MBDE) on AWS

This architecture diagram shows how you can streamline the product development life cycle by using AWS as the foundation for an MBDE approach to engineering and design. This slide details steps 1-7 of the architecture diagram.



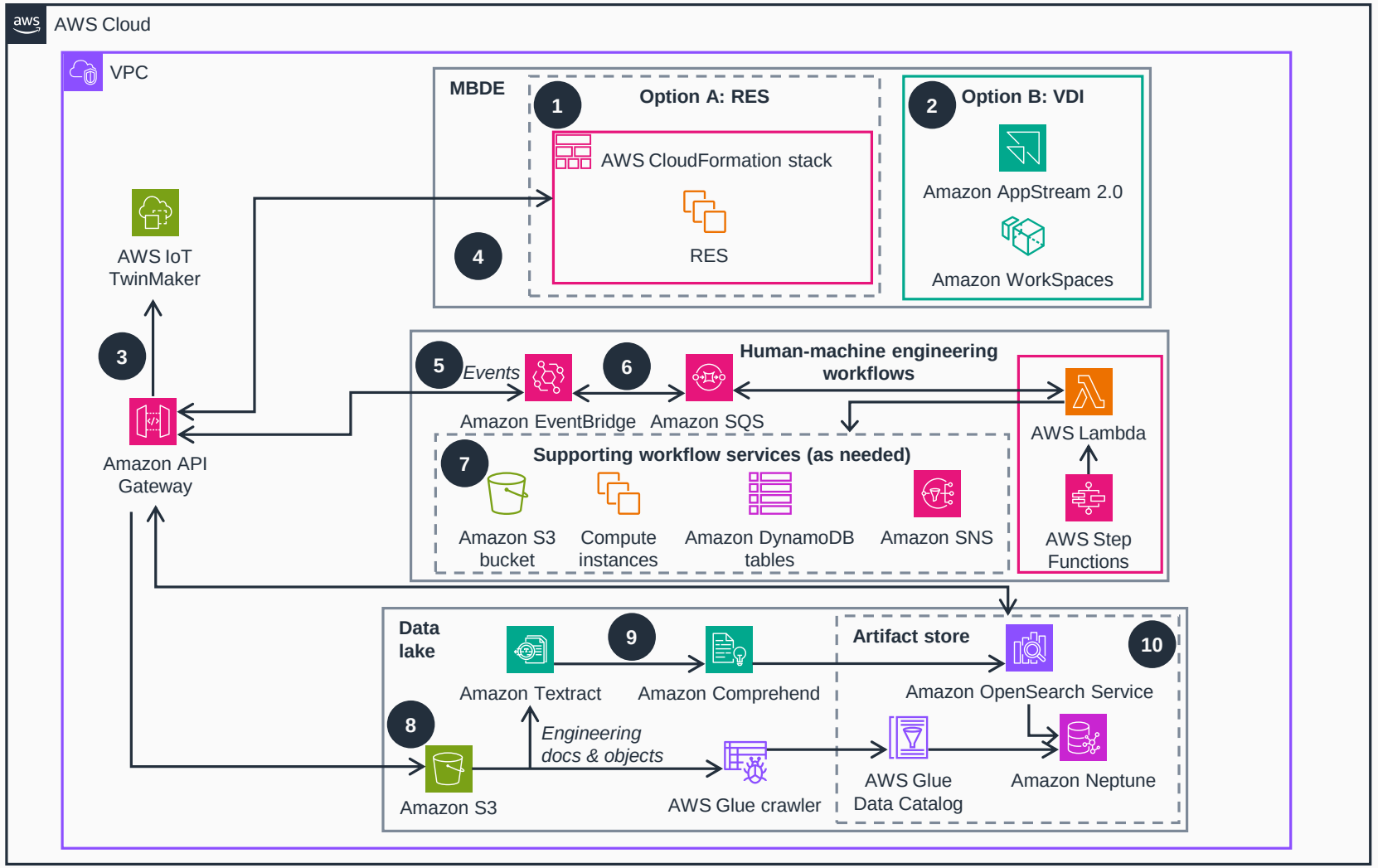
1. Option A: Use **AWS CloudFormation** to deploy **Research and Engineering Studio on AWS (RES)** within a virtual private cloud (VPC) and build a centralized MBDE—for example, a high-performance computing and virtual desktop infrastructure (VDI)—where you can deploy MBDE tools. Bring your own MBDE tools, or find them in **AWS Marketplace**.
2. Option B: Use **Amazon AppStream 2.0** for selectively-persistent VDI or **Amazon WorkSpaces** for persistent VDI to access the MBDE. (Bring your own MBDE tools, or find them in **AWS Marketplace**.)
3. Use **AWS IoT TwinMaker** to connect data streams from MBDE to build and deploy digital twins of real-world systems for use in engineering and design.
4. **Amazon API Gateway** is the center of communications among applications and environments. API-based microservices integrate new technologies and complementary services.
5. Use **Amazon EventBridge** to invoke workflows of all events, including the MBDE.
6. **Amazon Simple Queue Service (Amazon SQS)** makes sure the message is processed. **AWS Step Functions** builds state machine-based workflows implemented by **AWS Lambda** functions.
7. Based on the workflows implemented in the prior step, **Amazon Simple Storage Service (Amazon S3)** stores objects (output files) in a bucket; compute instances create ephemeral simulations; **Amazon DynamoDB** tables track engineering activities, and **Amazon Simple Notification Service (Amazon SNS)** performs team communications.

Reviewed for technical accuracy November 28, 2023

AWS Reference Architecture

Guidance for Model-Based Design Environment (MBDE) on AWS

This architecture diagram shows how you can streamline the product development life cycle by using AWS as the foundation for an MBDE approach to engineering and design. This slide details steps 8-10 of the architecture diagram.



8 Store engineering docs and objects in a centralized data lake on **Amazon S3**.

9 **Amazon Textract** and **Amazon Comprehend** extract text from documents. **Amazon OpenSearch Service** unlocks insights. An **AWS Glue** crawler catalogs data for engineering use cases. **Amazon Neptune** creates ontology and multidomain relationship knowledge graphs for artifacts and users.

10 The artifact store (**OpenSearch Service**, **AWS Glue Data Catalog**, and **Neptune**) feeds data to MBDE tools through **API Gateway**.

AWS Reference Architecture