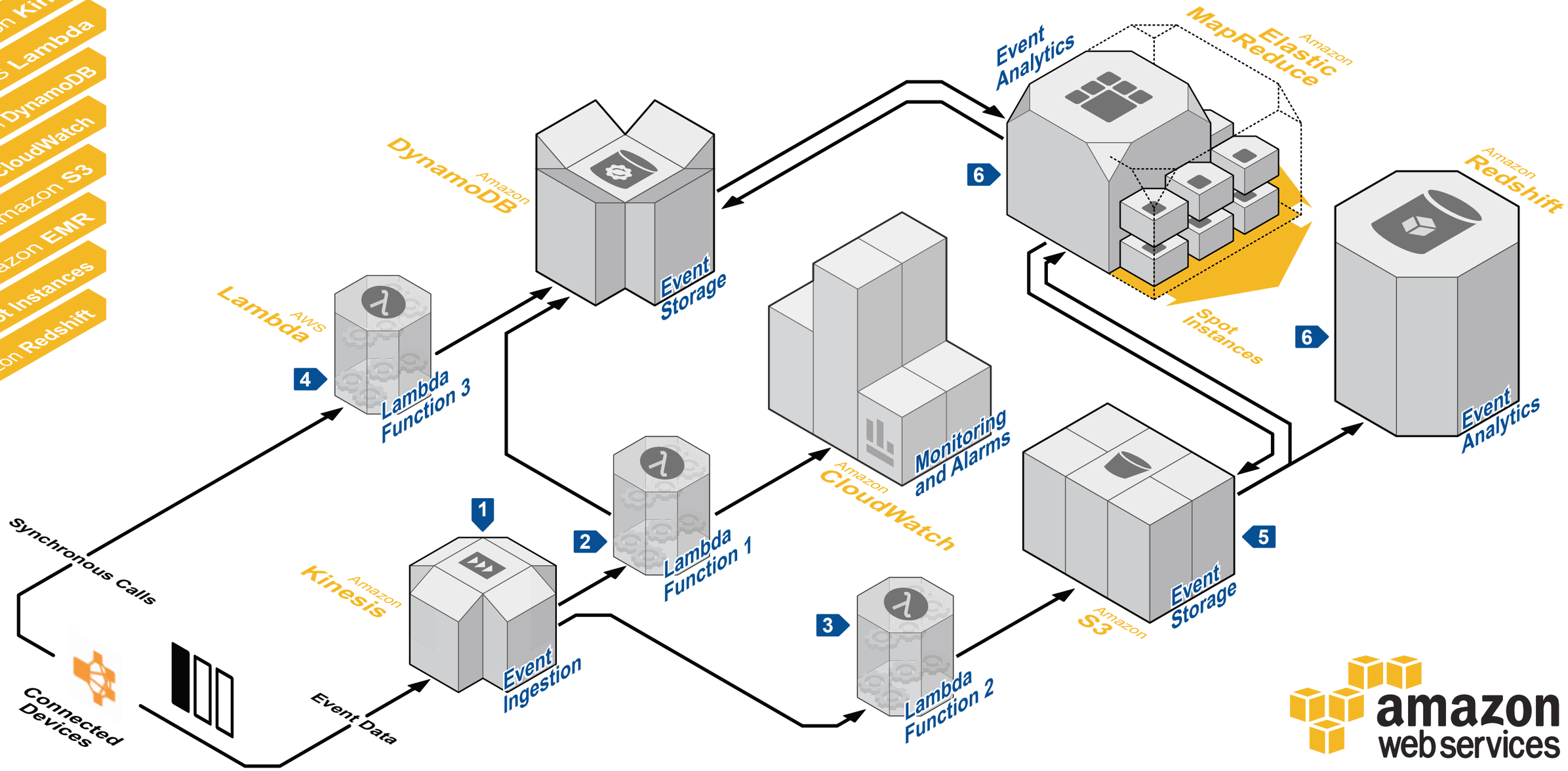
AWS Reference Architectures

- Amazon Kinesis
- AWS Lambda
- Amazon DynamoDB
- Amazon CloudWatch
- Amazon S3
- Amazon EMR
- EC2 Spot Instances
- Amazon Redshift

AWS LAMBDA: INTERNET OF THINGS BACKEND

With the Internet of Things comes the need to handle an ever increasing set of connected devices and data in a robust and cost-efficient way.

Amazon Web Services provides services and infrastructure to build reliable, fault-tolerant, and highly available IoT solutions in the cloud for handling both event ingestion and synchronous calls from devices.



System Overview

1 Devices send events with data to **Amazon Kinesis**, which provides large scale durable storage of the events for 24 hours and allows multiple **AWS Lambda** functions to process the same events.

2 In **AWS Lambda**, Lambda Function 1 processes the incoming events and stores the event data in a table in **Amazon DynamoDB** for low-latency access. DynamoDB allows the needed capacity of the table to be provisioned just by changing a configuration value. The Lambda function also sends the values to **AWS CloudWatch** for simple monitoring of aggregate metrics.

3 Lambda Function 2 processes the same events as Function 1 but stores the incoming events in **Amazon S3** for cost effective long-term durable archival. Storing data in S3 makes it easily accessible for analytics processing with **Amazon Elastic MapReduce (Amazon EMR)** and **Amazon Redshift**.

4 Lambda Function 3 provides a synchronous interface that devices call directly to retrieve data from DynamoDB. This can, for instance, be used to retrieve configuration information or historical event data that the devices need.

5 To lower cost, event data stored in **Amazon S3** that is no longer needed online is automatically migrated to **Amazon Glacier** or deleted after a certain retention period using S3 object lifecycle management.

6 **Amazon EMR** runs jobs that read and write directly to DynamoDB and S3 to analyze the data, generate aggregates, and create billing reports from the large set of events gathered from the device. Event data from S3 is loaded into **Amazon Redshift** to allow interactive exploration and analysis of the data using standard SQL queries.