

What is CloudWatch?

- CloudWatch provides metrics for every services in AWS
- Metric is a variable to monitor (CPUUtilization, DiskReadBytes etc)
- Metrics belong to namespaces
- Dimension is an attribute of a metric (instance id, environment, etc...).
- Up to 10 dimensions per metric
- These metrics include EC2 instance CPU utilization, EBS volume read and write IOPS, S3 bucket sizes etc
- Each Metrics have timestamps associated.



CloudWatch Monitoring

- **Basic :**
- EC2 instance metrics have metrics “every 5 minutes”
- **Detailed :**
- With detailed monitoring (for a cost), you get data/metrics “every 1 minute”.
- The AWS Free Tier allows us to have 10 detailed monitoring metrics.

CloudWatch Custom Metrics

- Possibility to define and send your own custom metrics to CloudWatch
- Ability to use dimensions (attributes) to segment metrics like Instance.id, Environment.name
- Use API call **PutMetricData**

CloudWatch Dashboards

- Great way to setup dashboards for quick access to keys metrics.
- Dashboards are global
- Dashboards can include graphs from different regions
- You can change the time zone & time range of the dashboards
- You can setup automatic refresh (10s, 1m, 2m, 5m, 15m)

CloudWatch Logs

- Applications can send logs to CloudWatch using the SDK
- CloudWatch can collect log from:
 - VPC Flow Logs: VPC specific logs
 - CloudTrail
 - CloudWatch log agents: for example on EC2 machines
 - AWS Lambda: collection from function logs

Log Stream and Log Groups

- Logs storage architecture:
 - **Log groups:** arbitrary name, usually representing an application
 - **Log stream:** instances within application / log files / containers. A stream must exist in only one log group.



CloudWatch Logs Metric Filter & Insights

- CloudWatch Logs can use filter expressions
- CloudWatch Logs Insights can be used to query logs and add queries to CloudWatch Dashboards

AWS CloudWatch Alarms

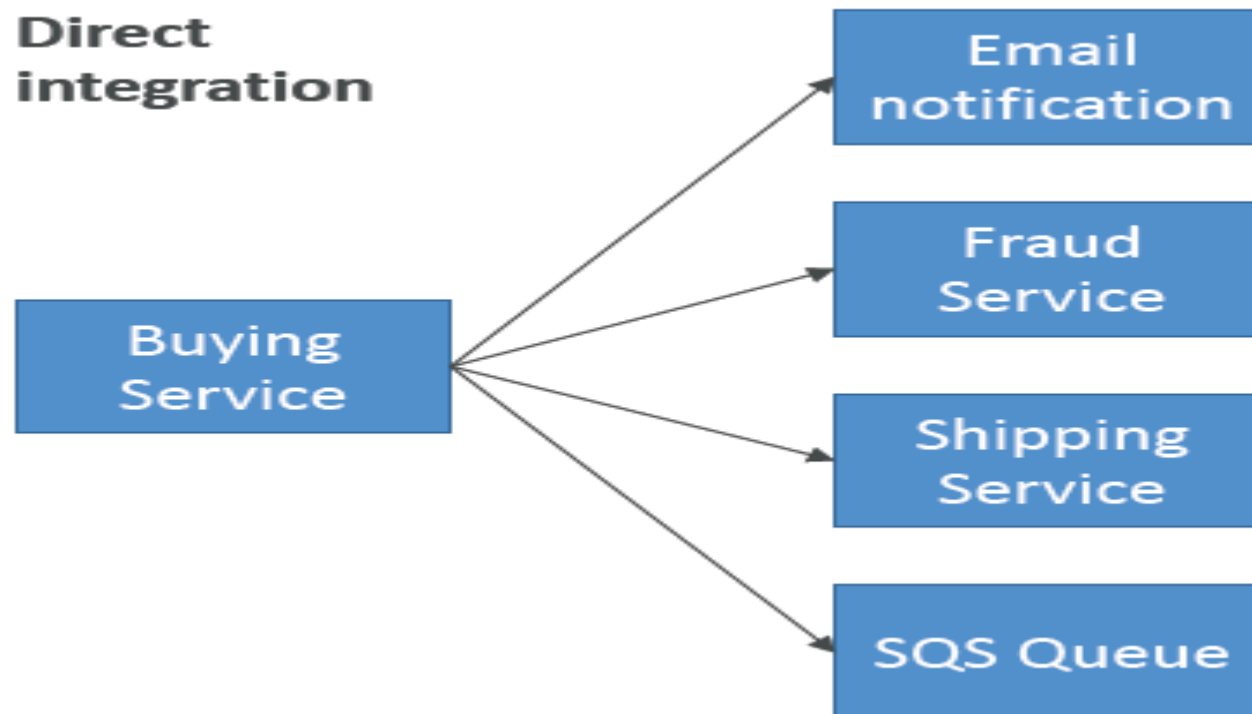
- Alarms are used to trigger notifications for any metric
- Alarms can go to SNS notifications, Auto Scaling, EC2 Actions.
- **Alarm States:**
 - **OK** - The metric or expression is within the defined threshold.
 - **INSUFFICIENT_DATA** - The alarm has just started, the metric is not available, or not enough data is available for the metric to determine the alarm state.
 - **ALARM** - The metric or expression is outside of the defined threshold.

AWS CloudWatch Events

- Source + Rule => Target
- Schedule: Cron jobs
- Event Pattern: Event rules to react to a service doing something
 - Ex: Trigger a resource on S3 Bucket/Object event.
- Triggers to Lambda functions, SQS/SNS etc
- CloudWatch Event creates a small JSON document to give information about the change

What is SNS?

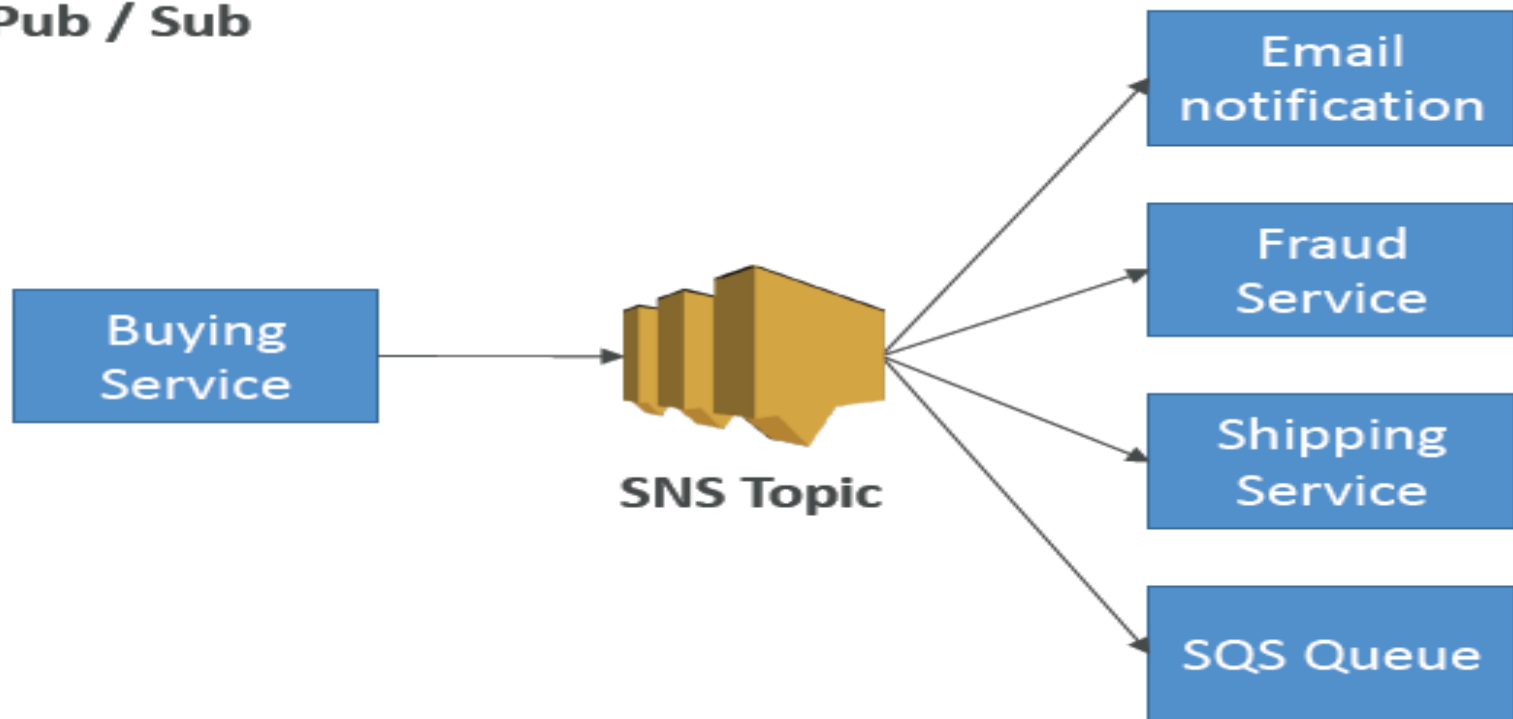
- What if you want to send one message to many receivers?



What is SNS?

- What if you want to send one message to many receivers?

Pub / Sub





AWS SNS

- The “event producer” only sends message to one SNS topic
- As many “event receivers” (subscriptions) as we want to listen to the SNS topic notifications
- Each subscriber to the topic will get all the messages
- Up to 10,000,000 subscriptions per topic
- 100,000 topics limit
- Subscribers can be : SQS , HTTP / HTTPS , Lambda, , Emails , SMS messages, Mobile Notifications

SNS Integration

- Some services can send data directly to SNS for notifications
- CloudWatch (for alarms)
- Auto Scaling Groups notifications
- Amazon S3 (on bucket events)
- CloudFormation (upon state changes => failed to build, etc)

AWS SNS - Publish

- Topic Publish (within your AWS Server – using the SDK)
 - Create a topic
 - Create a subscription (or many)
 - Publish to the topic
- Direct Publish (for mobile apps SDK)
 - Create a platform application
 - Create a platform endpoint
 - Publish to the platform endpoint

