DAY- 5
AWS CLOUDWATCH

AWS Architecture and Design

1. Day 1 Overview of Cloud Computing
2. Day 2 Overview of AWS
3. Day 3 Amazon EC2*
4. Day 4 Amazon EBS *
5. **Day 5 Amazon CloudWatch ***
6. Day 6 Amazon S3*
7. Day 7 Amazon Elastic Load Balancer *
8. Day 8 Amazon Auto Scaling *
9. Day 9 Amazon VPC *
10. Day 10 Amazon IAM *
11. Day 11 Amazon RDS
12. Day 12 Amazon Route 53 *
13. Day 13 Amazon DynamoDB* & Glacier
14. Day 14 Amazon Cloudfront* & Import Export & Amazon SES *
15. Day 15 Amazon ElasticBeanStalk & Amazon Cloudformation & Amazon OpsWorks
16. Day 16 AWS Economics & AWS Account Overview *
17. Day 17 AWS Architecture
18. Day 18 AWS Certification Preparation

[* - With Hands on Demo]

Amazon CloudWatch

Amazon CloudWatch

CloudWatch Helps for:

- Monitor AWS Resources in real time
- View Metrics & Trends
- Get Up-to-the-minute statistics
- View graphs
- Set alarms & send notifications
- Scaling
- Visibility in to resource utilization
- Demand Patterns

CloudWatch Events:

- Deliver timely stream of events
- Know change in AWS Resources
- Use rules to route

Amazon CloudWatch

Amazon CloudWatch enables you to monitor your:

- AWS EC2 instances
- AWS EBS volumes
- Auto Scaling
- AWS S3
- Cloudfront
- CloudSearch
- DynamoDB
- RDS
- Container Service
- Elastic Load Balancers
- Elasti Cache
- EMR
- Kinesis
- Lamda
- OpsWorks
- Redshift
- Route 53
- Amazon SQS Queues, SNS Topics,
- Storage Gateway, Workspaces, WAF
- Estimated AWS charges and a few more

http://aws.amazon.com/cloudwatch/

CloudWatch Functionality

Signing up:

- With EC2 you get basic monitoring free

Basic Monitoring:

- Gets you data at every 5 minutes

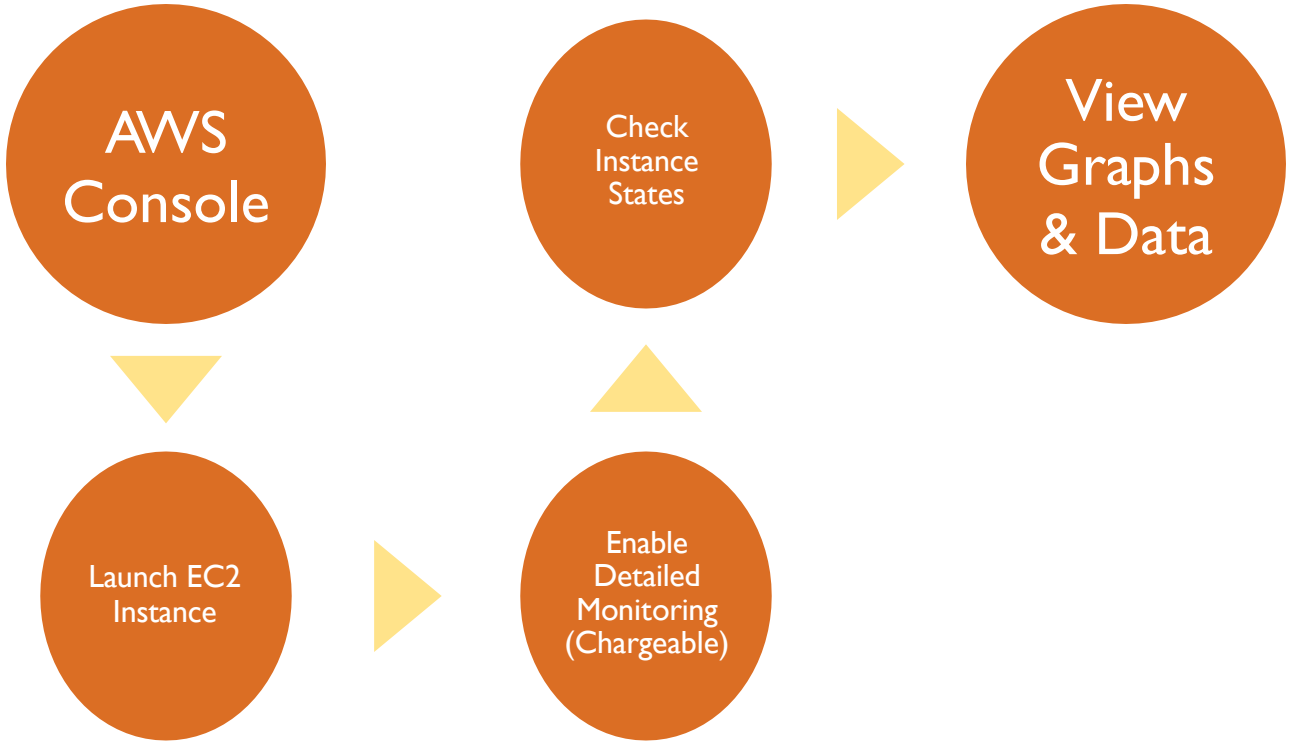
Auto Scaling:

- Send Notifications / Alerts to AutoScaling to help scale up & scale down

No additional Software Needed:

- Get upto minute of information without any additional software

Using CloudWatch



CloudWatch

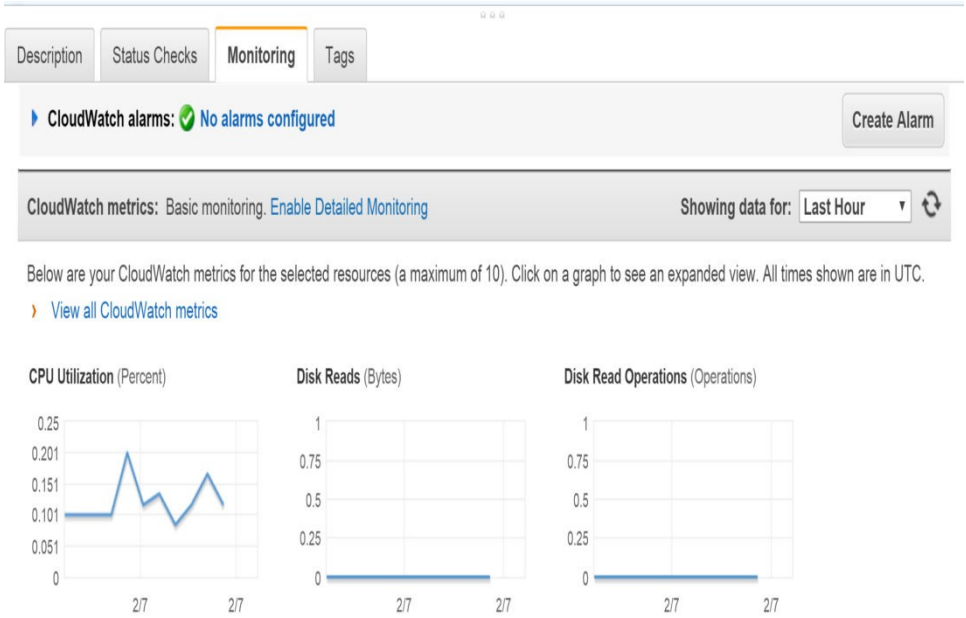
Pricing

Detailed Monitoring at one-minute frequency
$3.50 per instance per month for detailed monitoring

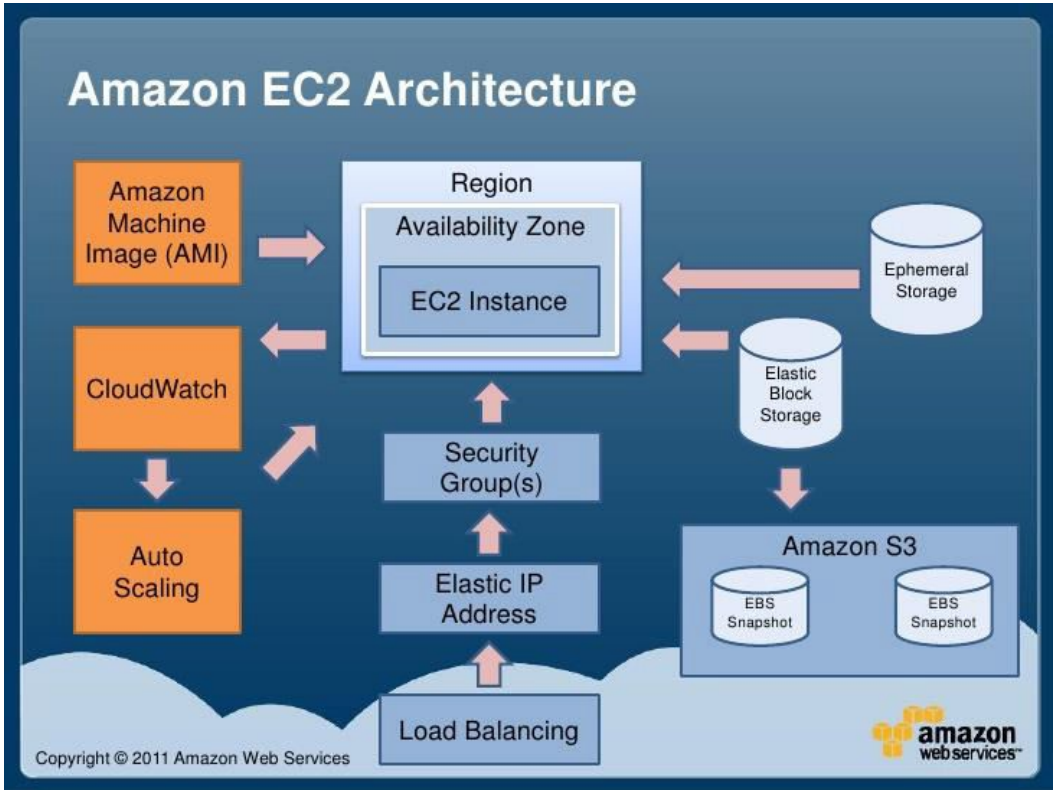
Amazon CloudWatch Custom Metrics
$0.50 per metric per month

Amazon CloudWatch Alarms
$0.10 per alarm per month

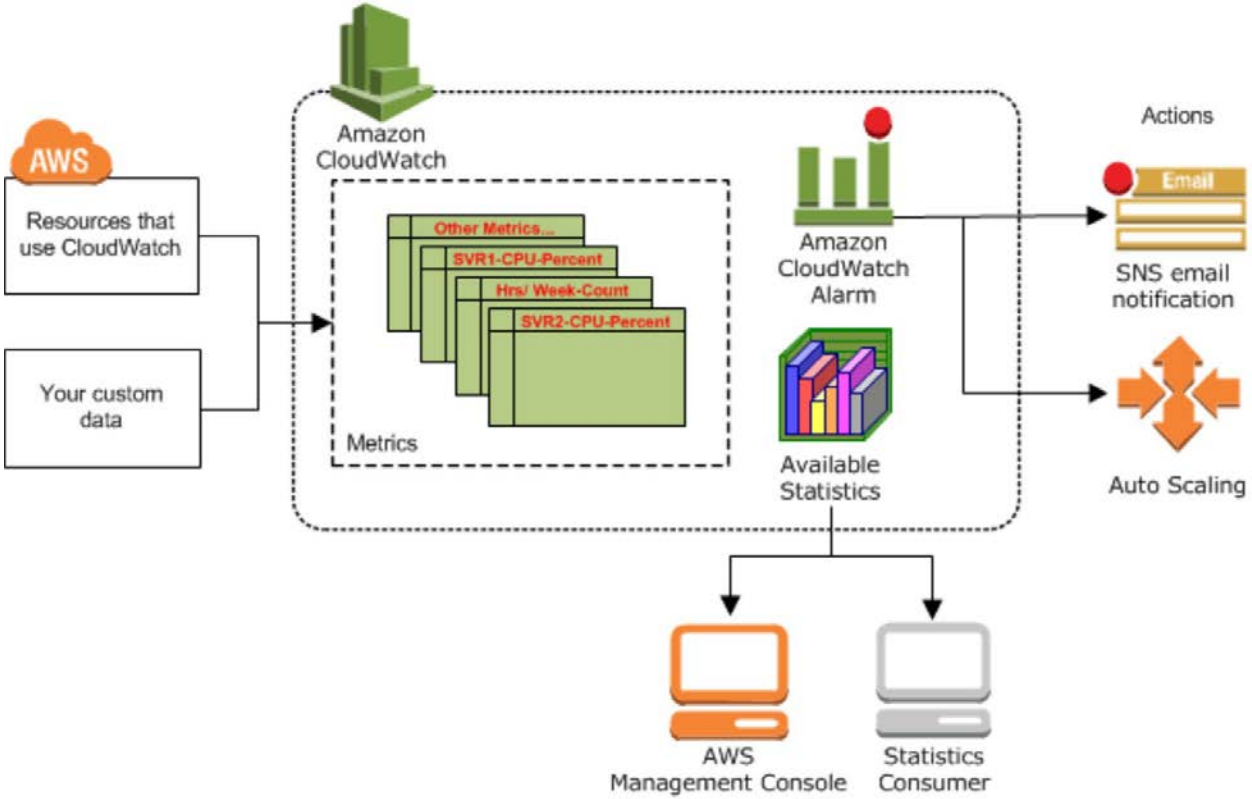
Amazon CloudWatch API Requests
$0.01 per 1,000 Get, List, or Put requests



Amazon EC2 Architecture



AWS CloudWatch



Services CloudWatch Supports

Basic Monitoring (Every 5 Minutes)	Detailed Monitoring (Every Minute)	
• EC2 • AutoScaling • EBS • DynamoDB (some metrics) • EMR • Amazon Machine Learning • SNS • SQS • SWS • Storage Gateway • Amazon Workspaces	• EC2 • AutoScaling • RDS • ELB • Route 53 • CloudFront • CloudSearch • DynamoDB (some metrics)	• EC2 Container Service • ElastiCache • Elasticsearch • Kinesis • AWS Lambda • AWS OpsWorks • RedShift • AWS WAF
AWS S3 does once every day		

Default Metrics

EC2 Instance

- CPUUtilization
- DiskReadBytes
- DiskReadOps
- DiskWriteBytes
- DiskWriteOps
- NetworkIn
- NetworkOut
- CPUCreditUsage & CPUCreditBalance
- StatusCheckFailed
  - StatusCheckFailed_Instance
    - Loss of network connectivity
    - Loss of system power
    - Software issues on the physical host
    - Hardware issues on the physical host
  - StatusCheckFailed_System
    - Failed system status checks
    - Misconfigured networking or startup configuration
    - Exhausted memory
    - Corrupted file system
    - Incompatible kernel

EBS

- VolumeReadBytes
- VolumeWriteBytes
- VolumeReadOps
- VolumeWriteOps
- VolumeTotalReadTime
- VolumeTotalWriteTime
- VolumeIdleTime
- VolumeQueueLength
- VolumeThroughputPercentage
- VolumeConsumedReadWriteOps

http://docs.aws.amazon.com/AmazonCloudWatch/latest/DeveloperGuide/ec2-metricscollected.html

http://docs.aws.amazon.com/AmazonCloudWatch/latest/DeveloperGuide/ebs-metricscollected.html#ebs-metrics

Metrics

A metric is the fundamental concept in CloudWatch.
It represents a time-ordered set of data points

Defined By:

- → Name
- → Namespace
- → One or more Dimensions
- → Time Stamp
- → (Optionally) a unit of measure

CloudWatch Concepts

Metrics

→ Namespaces: Container for metrics. All AWS services that provide Amazon CloudWatch data use a namespace string, beginning with "AWS/"
E.g. AWS/EC2, AWS/AutoScaling, AWS/ELB

→ Dimensions: A dimension is a name/value pair that helps you to uniquely identify a metric.
E.g., AutoScalingGroupName, ImageId, InstanceId, InstanceType, Volume ID.

→ Timestamps: Each metric data point must be marked with a time stamp.

→ Units : Units represent your statistic's unit of measure.
E.g., EC2 NetworkIn metric is Bytes

Statistics:

Statistics are metric data aggregations over specified periods of time

→ Periods
→ Regions

Namespaces

Amazon CloudWatch namespaces are conceptual containers for metrics.

AWS Product	Namespace
Amazon Elastic Block store	AWS/EBS
Amazon Elastic Compute Cloud	AWS/EC2
Amazon Relational Database	AWS/RDS
Amazon Simple Notification Service	AWS/SNS
Amazon Simple Queue Service	AWS/SQS
Auto Scaling	AWS/AutoScaling
Elastic Load Balancing	AWS/ELB

Dimensions

- → Categories for metrics' characteristics
- → Name/value pair
- → Default Metrics
  - » Can aggregate data across all dimensions
- → Up to ten dimensions to a metric

AWS Product	Dimension
EC2	AutoScalingGroupName InstanceId ImageId InstanceType
RDS	DBInstanceIdentifier DatabaseClass EngineName
Auto Scaling	Auto Scaling Group Name
Elastic Load Balancing	LoadBalancerName AvailabilityZone

Timestamps

→ Each metric data point must be marked with a time stamp

Valid Ranges:

- » Up to two weeks in the past
- » Upto one day in the future

→ By default, CloudWatch creates a time stamp based on the time the data was received

Note:

→ The time stamp you use in the request must be a dateTime object, with the complete date plus hours, minutes and seconds

→ Better to provide the time stamp under UTC.

→ Statistics from CloudWatch, all times reflect the UTC time zone.

Units

→ Statistics unit of measure

Common Unit:

- Seconds
- Bytes
- Bits
- Percent
- Count
- Bytes/Second (bytes per second)
- Bits/Second (bits per second)
- Count/Second (counts per second)
- None (default when no unit is specified)

Statistics

Metric data aggregations over specified periods of time:

Statistic	Description
Minimum	The lowest value observed during the specified period
Maximum	The highest value observed during the specified period
Sum	All values submitted for the matching metric added together
Average	The value of Sum/SampleCount during the specified period
Sample Count	The count (number) of data points used for the statistical calculation

Periods

→ Length of time for a specified statistic

→ Duration
  - » Short as one minute (60 seconds)
  - » Long as two weeks (1,209,600 seconds)

→ StartTime & EndTime
  - » To determine how many periods

Alarms

→ Amazon CloudWatch helps you make decisions and take immediate automatic actions based on metric data

→ Alarms can automatically initiate actions on your behalf, based on specified parameters

→ Alarm watches the metric and once the threshold is reached it will initiate the action on your behalf

Action:

- → Notification to SNS Topic
- → Notification to Auto Scaling Policy
- → EC2 Action

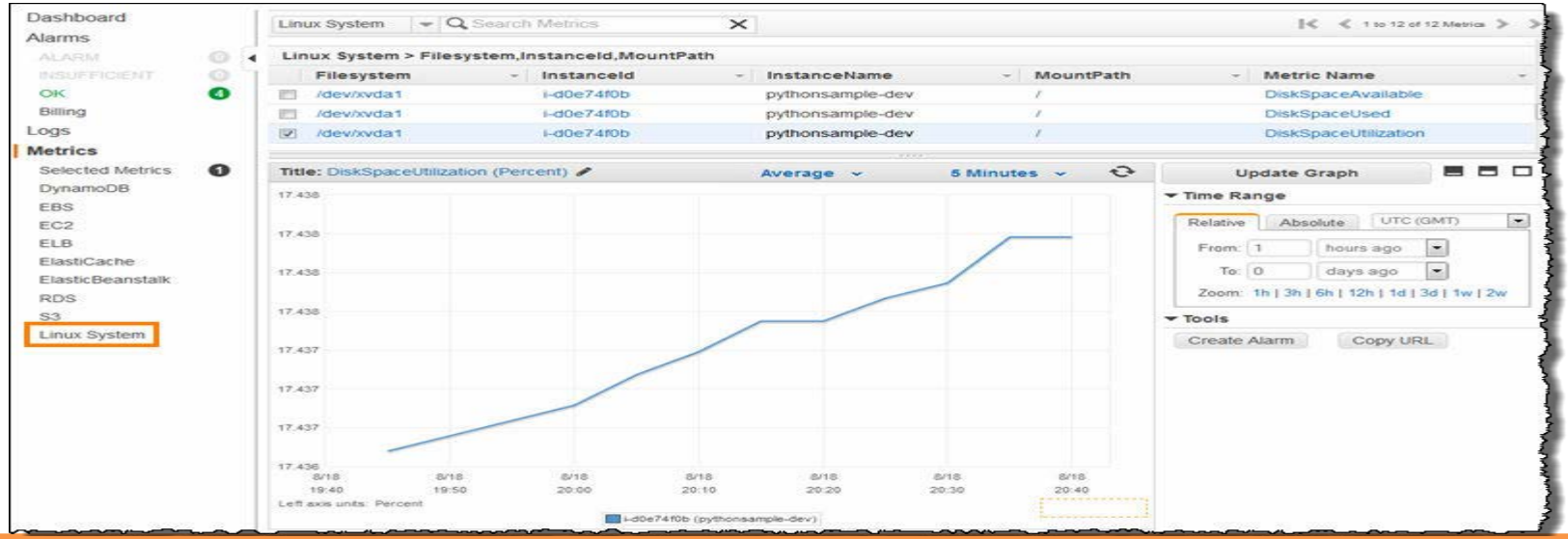
Regions

→ Each Amazon Region
  » Completely isolated from the others

→ CloudWatch does not aggregate data across Regions
  » Metrics are completely separate between Regions

Custom Metrics

- → You can publish your own metrics to CloudWatch with the put-metric-data
- → If you call put-metric-data with a new metric name, CloudWatch creates a new metric for you. Otherwise, CloudWatch associates your data with the existing metric that you specify
- → The scripts for Windows are sample PowerShell scripts that comprise a fully functional example that reports memory, page file, and disk space utilization metrics for an Amazon EC2 Windows instance.
- → The Amazon CloudWatch Monitoring Scripts for Linux are sample Perl scripts that demonstrate how to produce and consume Amazon CloudWatch custom metrics



Pricing

Detailed Monitoring for EC2 Instances	Custom Metrics	Alarms	Free Tiers
At one-minute frequency	$0.50 per metric per month	$0.10 per alarm per month	Basic Monitoring metrics (at five-minute frequency).
$3.50 per instance per month			10 metrics; 10 alarms; 1 million API requests

Demo

In the next video we will do hands on with AWS CloudWatch

Thank You

Email us – support@intellipaat.com

Visit us - https://intellipaat.com