Certified SysOps Administrator – Associate 2017

Exam

* Monitoring & Metrics – 15%
* High Availability – 15%
* Analysis – 15%
* Deployment & Provisioning – 15%
* Data Management – 12%
* Security – 15%
* Networking – 13%

**CloudWatch**

* Monitors your AWS resources and applications it runs on.
  + ELB, Route53, Autoscale, EBS Volumes, CloudFront, Storage Gateways, DynamoDB, Elasticache Nodes, RDS Instances, EMR, Redshift, SNS topics, SQS, Opsworks, Cloudwatch logs, and bill.
* Metrics are stored for 2 weeks. Can retrieve longer ones by GetMetric Statistics API.
* Custom Metrics can have a minimum of 1 minute intervals.
* If resources are terminated, data can be retrieved up to 2 weeks.
* EC2
  + CPU, Network, Disk, Status Check
  + Custom Metric needed for Harddisk utilization
  + **Default monitoring is 5 minutes or detailed can be enabled by 1 minute.**
  + System Status Checks (Checks underlying physical Host)
    - Check loss of network connectivity
    - Loss of system power
    - Software issues on the physical host.
    - Hardware issues on the physical host.
    - Best way to resolve is to stop and start the VM.
  + Instance Status Checks (Checks VM)
    - Failed system status checks
    - Misconfigured networking or startup configuration
    - Exhausted memory
    - Corrupted file system
    - Incompatible kernel
    - Best way to troubleshoot is by rebooting the instance and make modifications in your OS

Cloudwatch Lab:

yum install perl-Switch perl-DateTime perl-Sys-Syslog perl-LWP-Protocol-https -y

mkdir /CloudWatch

curl http://aws-cloudwatch.s3.amazonaws.com/downloads/CloudWatchMonitoringScripts-1.2.1.zip -O

unzip CloudWatchMonitoringScripts-1.2.1.zip

rm -rf CloudWatchMonitoringScripts-1.2.1.zip

cd aws-scripts-mon/

nano mon-put-instance-data.pl

./mon-put-instance-data.pl --mem-util --verify –verbose

./mon-put-instance-data.pl --mem-util --mem-used --mem-avail

Nano crontab

**EBS Monitoring**

* Throughput Optimized HDD (st1) – streaming workloads requiring consistent, fast throughput at a low price.
* Max volume size is 16 TiB
  + Go from 1GB to 4 GB to 500 GB.
  + 3 IOPS per GB
    - Can burst by using I/O Credits
    - (3000-1500) = may need to increase drive for me.
    - When more baseline performance I/O is required, it uses I/O credits in the credit balance to burst to the required performance level
    - Each volume receives an initial I/O credit balance of 5,400,000 I/O credits. Can sustain 3,000 IOPS for 30 minutes. If you don’t go over, you earn credits.
* Recommended to have SSD as the boot volume.
* **Pre-warming** – maximum performance is started at initialization. Only time this may be needed is for restoring from snapshots. Preliminary action takes times and can cause a significant increase in the latency of an I/O operation the first time each block is accessed.
* **Initialization** - avoid performance hit in production by reading from all of the blocks on your volume before you use it.
* **Volume Read Bytes/Volume Write Bytes –** information on the I/O operations in a specified period of time.
* **Volume Read Ops/Volume Write Ops –** total number of I/O operations in a specified period of time.
* **Volume Total Read Time/Volume Total Write Time –** total number of seconds spent by all operations that completed in a specified period of time.
* **Volume Idle Time –** total number of seconds in a specified period of time when no read or write operations were submitted.
* **Volume Queue Length –** read and write operation requests waiting to be completed in a specified period of time. (indicator of high IOPS)
* **Volume Thoughput Percentage –** Provisioned IOPS (SSD) only. Percentage of I/O operations per second (IOPS) delivered of the total IOPS provisioned for an Amazon EBS volume.
* **Volume Consumed Read Write Ops -** Provisioned IOPS (SSD) only. Total amount of read and write operations consumed in a specified period of time.

**Volume Status:**

* + **OK –** Normal (Volume performance is as expected)
  + **Warning –** Degraded (Volume performance is below expectations). Severely Degraded (Volume performance is well below expectations)
  + **Impaired –** Stalled (Volume performance is severely impacted). Not Available (Unable to determine I/O performance because I/O is disabled)
  + **Insufficient-data**

**Modifying EBS Volumes:**

* Can increase a size or change type and adjust the IOPS on the fly without detaching. Same for detaching.
* **Steps:**
  + Issue the modification command (Console or command line)
  + Monitor the progress of the modification
  + Extend files system to take advantage of the increased storage capacity.

**Monitoring RDS:**

* Metrics:
  + BinLogDiskUsage
  + CPUUtilization
  + **DatabaseConnections**
  + **DiskQueueDepth -** # of read/write I/O to access your RDS instance.
  + FreeableMemory
  + **FreeStorageSpace**
  + **ReplicaLag (Seconds) – lag between RDS instance and read replica’s**
  + SwapUsage
  + ReadIOPS
  + **WriteIOPS**
  + **ReadLatency**
  + **WriteLatency**
  + ReadThroughput
  + WriteTrhoughput
  + NetworkReceiveThroughput
  + NetworkTransmitThroughput
* Events:
  + Creates an SNS topic to send notifications out to.

Monitoring ELB:

* Is monitored every 60 seconds if traffic is coming into it. Otherwise, it won’t be reported.
* Metrics:
  + HealthyHostCount
  + UnHealthyHostCount
  + RequestCount
  + Latency
  + HTTPCode\_ELB\_4XX
  + HTTPCode\_ELB\_5XX
  + HTTPCode\_Backend\_2XX
  + HTTPCode\_Backend\_3XX
  + HTTPCode\_Backend\_4XX
  + HTTPCode\_Backend\_5XX
  + BackendConnectionErrors
  + **SurgeQueueLength –** count of total # of requests that are pending submission to a registered instance
  + **Spillovercount –** count of total number of requests that were rejected due to the queue being full.