AWS Cloudwatch

Steps

- AWS Cloudwatch is a service which can be used to monitor aws infrastructure(Resources and applications).
- In cloudwatch we can create dashboards to deal with different applications.
- We can set Alarms by giving some thresholds to some parameters and we get the notifications when the parameters cross the threshold.
- We can also create events so that when there are any changes in aws environment we can route them to different targets for processing.
- We can also use it as remote server for logs of instances and other services by using the logs service in cloudwatch.
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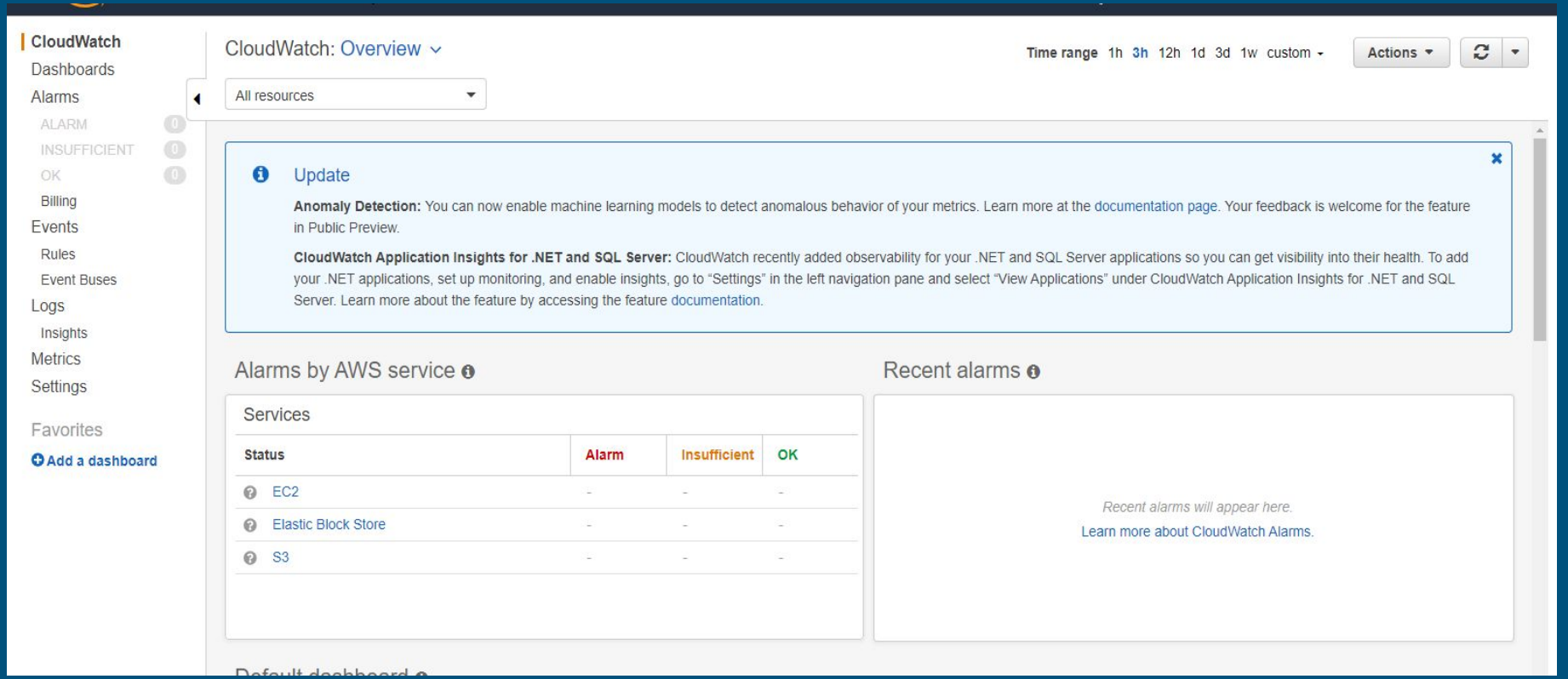
-


CloudWatch
Dashboards
Alarms
ALARM 0
INSUFFICIENT 0
OK 0
Billing
Events
Rules
Event Buses
Logs
Insights
Metrics
Settings
Favorites
Add a dashboard
CloudWatch: Overview
All resources
Time range 1h 3h 12h 1d 3d 1w custom
Actions
Update
Anomaly Detection: You can now enable machine learning models to detect anomalous behavior of your metrics. Learn more at the documentation page. Your feedback is welcome for the feature in Public Preview.
CloudWatch Application Insights for .NET and SQL Server: CloudWatch recently added observability for your .NET and SQL Server applications so you can get visibility into their health. To add your .NET applications, set up monitoring, and enable insights, go to "Settings" in the left navigation pane and select "View Applications" under CloudWatch Application Insights for .NET and SQL Server. Learn more about the feature by accessing the feature documentation.
Alarms by AWS service
Services
Status
Alarm
Insufficient
OK
EC2
Elastic Block Store
S3
Recent alarms
Recent alarms will appear here.
Learn more about CloudWatch Alarms.

Steps

- Now we create a dashboard.
- Go to dashboard page and click on create dashboard.Now we have give a name to the dashboard.
- Now we have to select the widget type to set the format in which we need the metrics to be displayed.Ex:Line,Number,Text,Query Results etc
- Now the services which we are using will be displayed. We have to select the service we want to monitor and then select the per-instance metrics which we want to monitor and then select create widget.
-

Add to this dashboard

Select a widget type to configure and add to this dashboard.

Line
Compare metrics over time

Stacked area
Compare the total over time

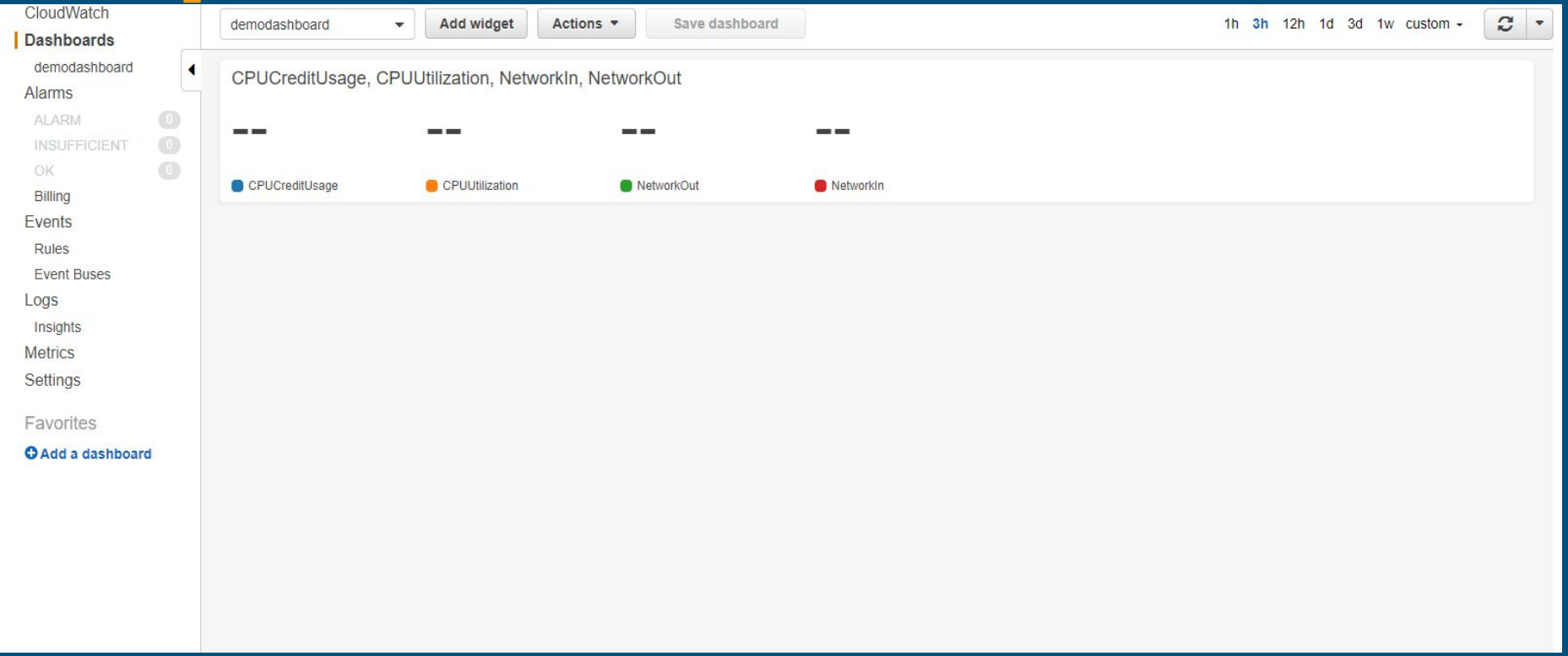
Number
Instantly see the latest value for a metric

Text
Free text with markdown formatting

Query results
Explore results from Logs Insights

Cancel Configure

Steps


CloudWatch
Dashboards
demodashboard
Alarms
ALARM 0
INSUFFICIENT 0
OK 0
Billing
Events
Rules
Event Buses
Logs
Insights
Metrics
Settings
Favorites
Add a dashboard
demodashboard
Add widget
Actions
Save dashboard
1h 3h 12h 1d 3d 1w custom
CPUCreditUsage, CPUUtilization, NetworkIn, NetworkOut
--
--
--
--
CPUCreditUsage
CPUUtilization
NetworkOut
NetworkIn

Steps

- If we want to get notifications about the different metrics in the dashboard we need to use the the Simple Notification Service(SNS) of aws.
- Go to the SNS service and now create a topic with any name.We have to now add subscription to the topic.
- Select the Protocol as email and give the email in the endpoint to get notifications and click create subscription.Now you have to confirm subscription by going to your mail.
- Now to get notification go to the alarms service in cloud watch and create an alarm ,
- And select the per-instance metric and set the threshold value.Now select the SNS topic we created earlier.Now give an alarm name and select create alarm.
- To increase CPU Utilization use the command `stress-ng --cpu 4 --io 2 --vm 1 --vm-bytes 1G --timeout 60s --metrics-brief`

Create subscription

Details

Topic ARN

arn:aws:sns:us-east-1:665478631412:SNS-I

Protocol

The type of endpoint to subscribe

Email

Endpoint

An email address that can receive notifications from Amazon SNS.

sforcloud@gmail.com

After your subscription is created, you must confirm it. Info

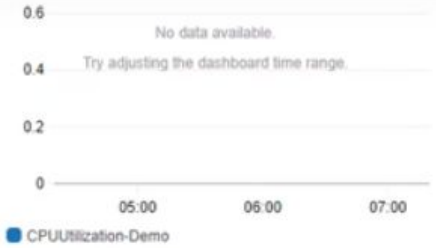
Subscription filter policy - *optional*

This policy filters the messages that a subscriber receives. Info

Cancel

Create subscription

Step 4
Preview and create



Metric name
CPUUtilization-Demo

InstanceId
i-009c84d8ec6e38b8a

Instance name
Cloud-Watch

Statistic
Average

Period
5 minutes

Conditions

Threshold type

- Static — Use a value as a threshold
- Anomaly detection — Use a band as a threshold

Whenever CPUUtilization-Demo is...
Define the alarm condition

- Greater — > threshold
- Greater/Equal — >= threshold
- Lower/Equal — <= threshold
- Lower — < threshold

than...
Define the threshold value

30

Must be a number

Additional configuration

Cancel Next

Configure actions

Step 3
Add a description

Step 4
Preview and create

Whenever this alarm state is...
Define the alarm state that will trigger this action

Remove

- in Alarm
  The metric or expression is outside of the defined threshold.
- OK
  The metric or expression is within the defined threshold.
- INSUFFICIENT_DATA
  The alarm has just started or not enough data is available.

Select an SNS topic
Define the SNS (Simple Notification Service) topic that will receive the notification

- Select an existing SNS topic
- Create new topic
- Use topic ARN

Send a notification to...

SNS-Demo

Only email lists for this account are available

Email (endpoints)

sforcloud@gmail.com - View in SNS Console

Add notification

Auto Scaling action

Add Auto Scaling action

EC2 action

Add EC2 action

Cancel Previous Next

Steps

- The metrics we can display are limited to the ones available in default in the per-instance metrics.For example we won't find metrics like memory utilization ,disk space utilization and swap.
- We can configure these additional metrics as custom metrics.
- These are available as packages in google as aws cloudwatch custom metrics.
- For example if we need to install these packages on ubuntu server, we need to log into the server run the following commands
- sudo apt-get update
- sudo apt-get install unzip
- sudo apt-get install libww-perl libdatetime-perl
- And for downloading monitoring scripts go to a folder and run the command
- ```
  curl https://aws-cloudwatch.s3.amazonaws.com/downloads/CloudWatchMonitoringScripts-1.2.2.zip -O
  ```
  ```

Steps

- For installing the monitoring scripts we should run the following commands
- unzip CloudWatchMonitoringScripts-1.2.2.zip && \
- rm CloudWatchMonitoringScripts-1.2.2.zip && \
- cd aws-scripts-mon
- Now we have to assign a role to the instance with required permissions so that it can read and write the custom metrics to cloudwatch.
- Now to collect the available memory metrics and send to cloudwatch,counting cache and buffer memory as used run the following command
- ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-util --mem-used --mem-avail --swap-used --swap-util --disk-space-util --disk-space-used --disk-path=/
-

```
[root@ip-172-31-38-134 ~]# curl https://aws-cloudwatch.s3.amazonaws.com/downloads/CloudWatchMonitoringScripts-1.2.2.zip -O
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 24225  100 24225    0     0   142k      0 --:--:-- --:--:-- --:--:--  142k
[root@ip-172-31-38-134 ~]# ls
CloudWatchMonitoringScripts-1.2.2.zip
[root@ip-172-31-38-134 ~]# unzip CloudWatchMonitoringScripts-1.2.2.zip
Archive:  CloudWatchMonitoringScripts-1.2.2.zip
  extracting: aws-scripts-mon/awscreds.template
  inflating: aws-scripts-mon/AwsSignatureV4.pm
  inflating: aws-scripts-mon/CloudWatchClient.pm
  inflating: aws-scripts-mon/LICENSE.txt
  inflating: aws-scripts-mon/mon-get-instance-stats.pl
  inflating: aws-scripts-mon/mon-put-instance-data.pl
  inflating: aws-scripts-mon/NOTICE.txt
[root@ip-172-31-38-134 ~]# ls
aws-scripts-mon  CloudWatchMonitoringScripts-1.2.2.zip
[root@ip-172-31-38-134 ~]#
```

```
[root@ip-172-31-38-134 aws-scripts-mon]# ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-used --mem-avail

Successfully reported metrics to CloudWatch. Reference Id: b32fa5eb-a838-11e9-8879-75f0416fb5dd

[root@ip-172-31-38-134 aws-scripts-mon]# ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-used --mem-avail --swap-used

Successfully reported metrics to CloudWatch. Reference Id: ed3662c0-a838-11e9-b59b-79220dce8537

[root@ip-172-31-38-134 aws-scripts-mon]#
[root@ip-172-31-38-134 aws-scripts-mon]# ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-used --mem-avail --swap-used --swap-util --disk-space-util --disk-space-used

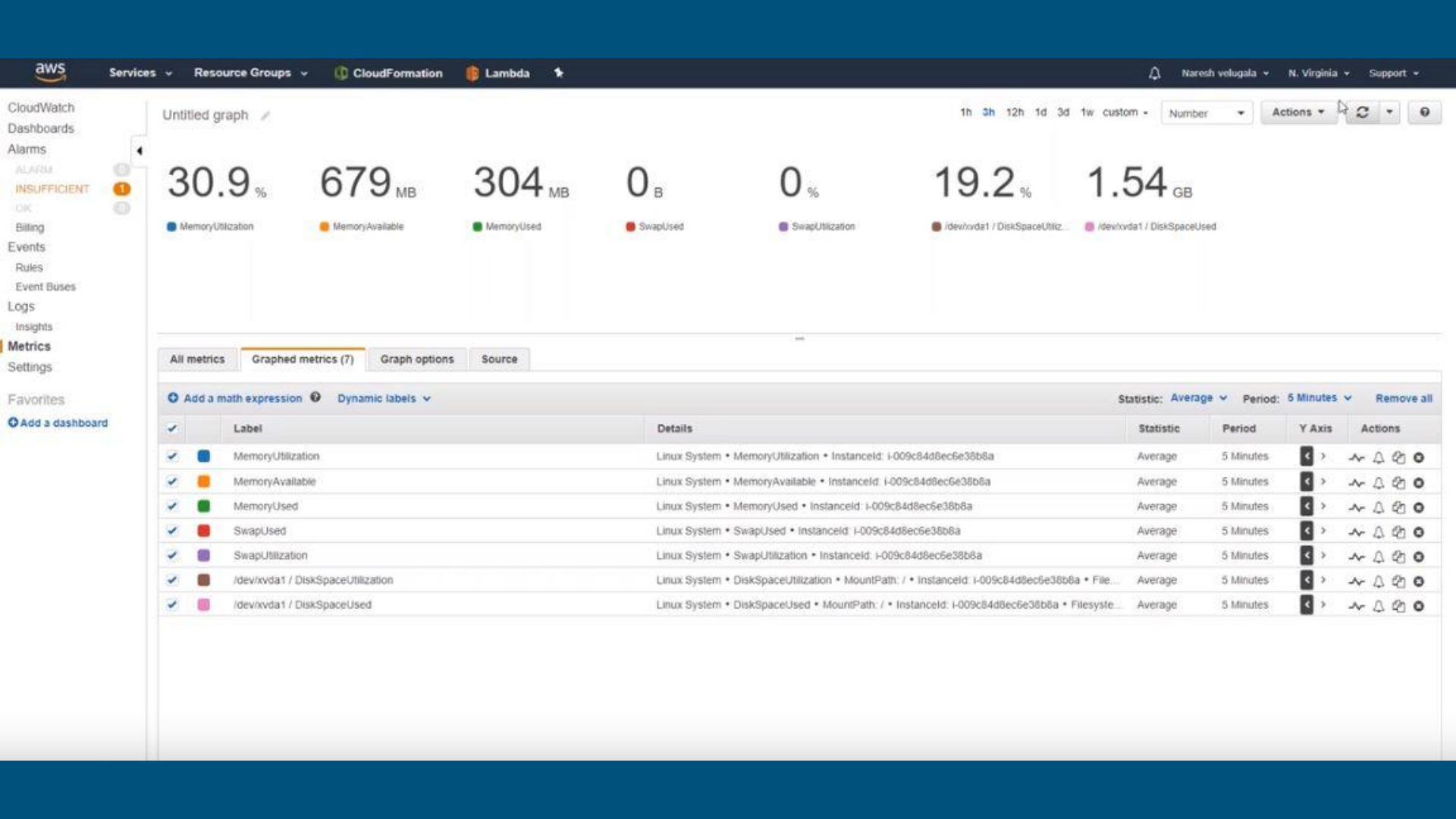
ERROR: Metrics to report disk space are provided but disk path is not specified.

For more information, run 'mon-put-instance-data.pl --help'

[root@ip-172-31-38-134 aws-scripts-mon]# ./mon-put-instance-data.pl --mem-used-incl-cache-buff --mem-used --mem-avail --swap-used --swap-util --disk-space-util --disk-space-used --disk-path=/

Successfully reported metrics to CloudWatch. Reference Id: 1b3549e9-a839-11e9-8919-cd55268f3d69

[root@ip-172-31-38-134 aws-scripts-mon]#
```


aws
Services
Resource Groups
CloudFormation
Lambda
Naresh velugala
N. Virginia
Support
CloudWatch
Dashboards
Alarms
ALARM 0
INSUFFICIENT 1
OK 0
Billing
Events
Rules
Event Buses
Logs
Insights
Metrics
Settings
Favorites
Add a dashboard
Untitled graph
1h 3h 12h 1d 3d 1w custom
Number
Actions
30.9 %
679 MB
304 MB
0 B
0 %
19.2 %
1.54 GB
MemoryUtilization
MemoryAvailable
MemoryUsed
SwapUsed
SwapUtilization
/dev/xvda1 / DiskSpaceUtiliz...
/dev/xvda1 / DiskSpaceUsed
All metrics
Graphed metrics (7)
Graph options
Source
Add a math expression
Dynamic labels
Statistic: Average
Period: 5 Minutes
Remove all
Label
Details
Statistic
Period
Y Axis
Actions
MemoryUtilization
Linux System • MemoryUtilization • InstanceId: i-009c84d8ec6e38b8a
Average
5 Minutes
MemoryAvailable
Linux System • MemoryAvailable • InstanceId: i-009c84d8ec6e38b8a
Average
5 Minutes
MemoryUsed
Linux System • MemoryUsed • InstanceId: i-009c84d8ec6e38b8a
Average
5 Minutes
SwapUsed
Linux System • SwapUsed • InstanceId: i-009c84d8ec6e38b8a
Average
5 Minutes
SwapUtilization
Linux System • SwapUtilization • InstanceId: i-009c84d8ec6e38b8a
Average
5 Minutes
/dev/xvda1 / DiskSpaceUtilization
Linux System • DiskSpaceUtilization • MountPath: / • InstanceId: i-009c84d8ec6e38b8a • File...
Average
5 Minutes
/dev/xvda1 / DiskSpaceUsed
Linux System • DiskSpaceUsed • MountPath: / • InstanceId: i-009c84d8ec6e38b8a • Filesyste...
Average
5 Minutes

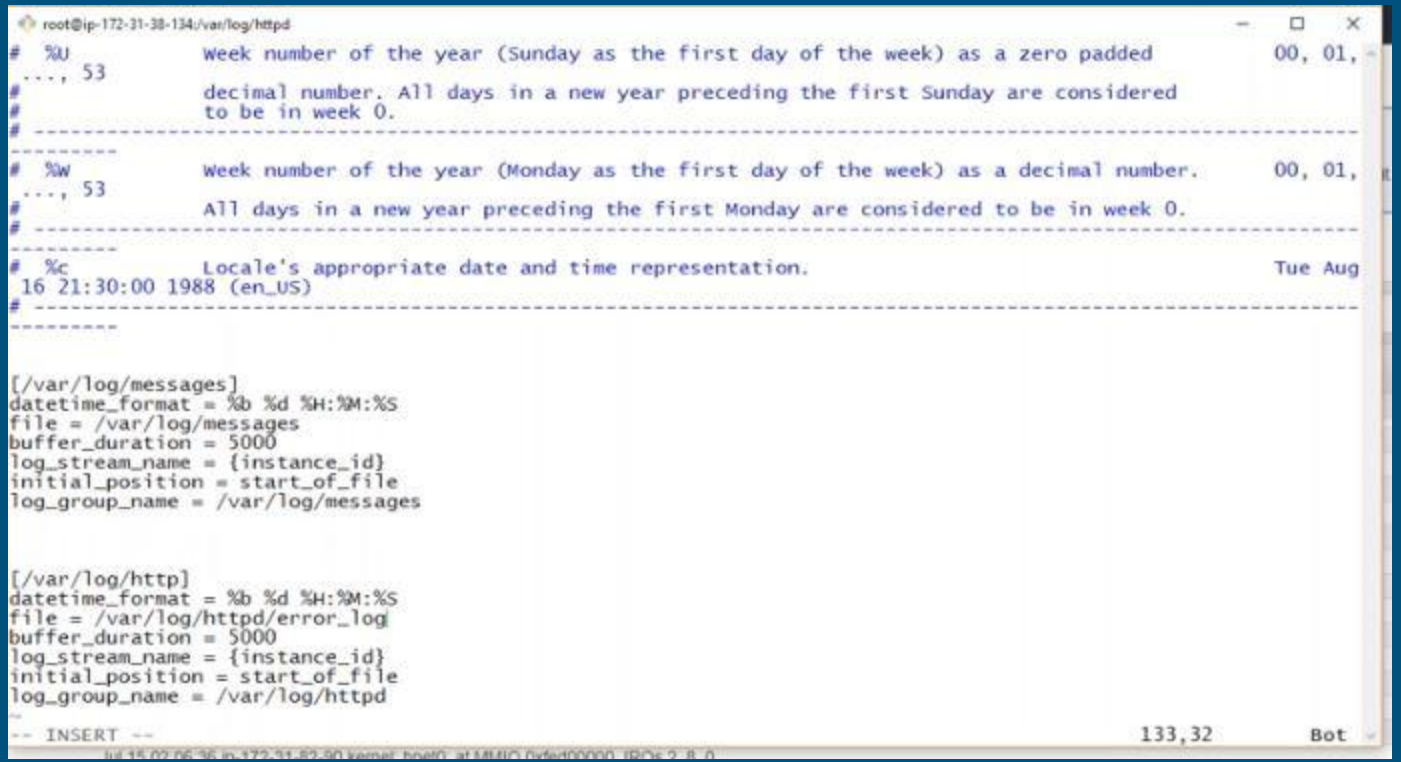
Steps

- Now we are working on setting up a remote-sys-log server so that all the error logs and other important data can be accessed from aws cloudwatch logs rather than logging into instance and looking for logs.
- Now we have to configure a package to display the logs from instance.So, we run this command
- yum install awslogs
- systemctl start awslogsd
- systemctl enable awslogsd
- Now we can see logs in cloudwatch under log group name var/log/messages
- To add additional logs (for example :error logs in httpd)to the cloudwatch we need to modify the config file /etc/awslogs/awslogs.conf

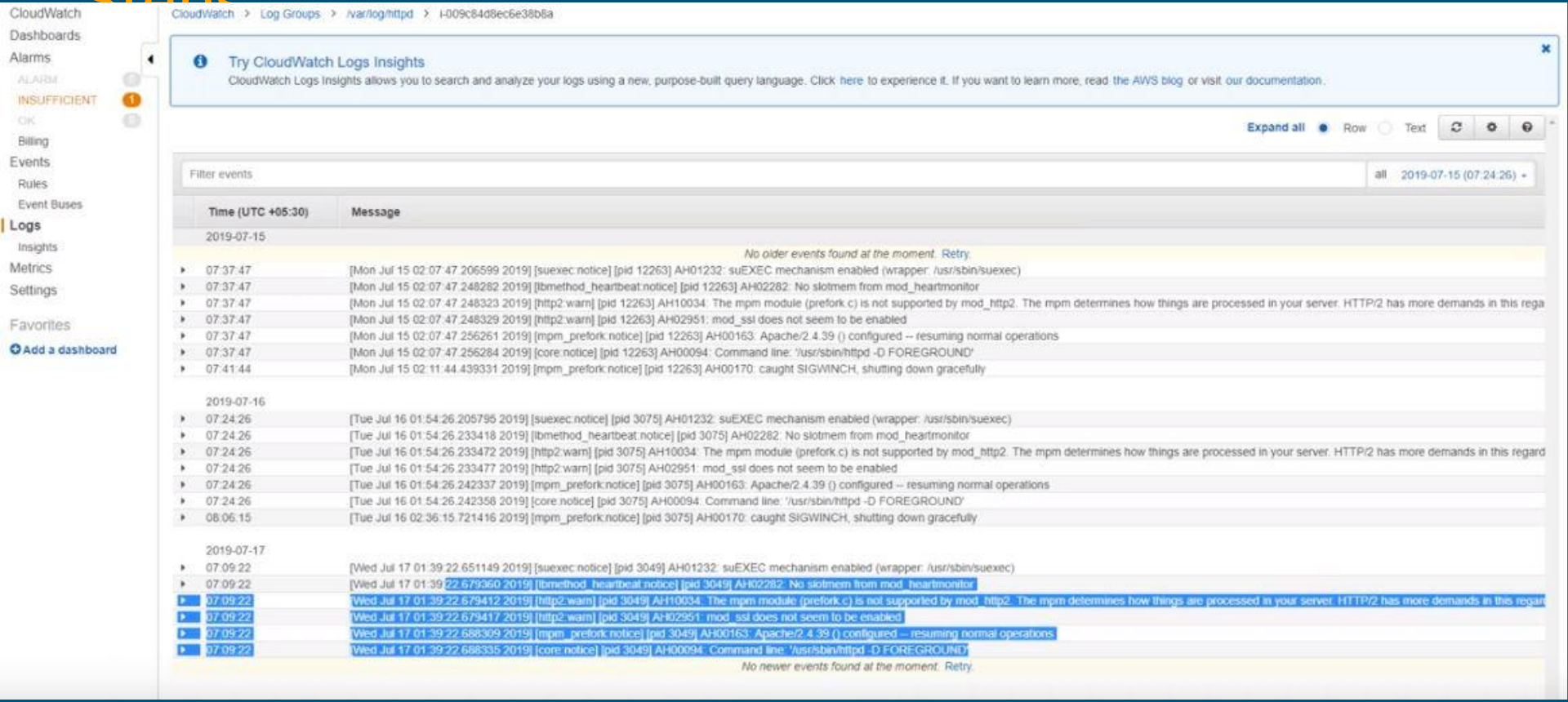
Steps

- Now add the following data to the awslogs.conf file
- [/var/log/http]
- datetime_format= %b %d %H:%M:%S
- file = /var/log/httpd/error_log
- buffer_duration = 5000
- log_stream_name = {instance_id}
- initial_position = start_of_file
- log_group_name = /var/log/httpd
- Now restart the service using following command
- systemctl restart awslogsd
- We will now see that new logs are added under log group name /var/log/httpd

Steps


root@ip-172-31-38-134:/var/log/httpd
%U Week number of the year (Sunday as the first day of the week) as a zero padded 00, 01, ..., 53
decimal number. All days in a new year preceding the first Sunday are considered to be in week 0.
%W Week number of the year (Monday as the first day of the week) as a decimal number. 00, 01, ..., 53
All days in a new year preceding the first Monday are considered to be in week 0.
%c Locale's appropriate date and time representation. Tue Aug 16 21:30:00 1988 (en_US)
[/var/log/messages]
datetime_format = %b %d %H:%M:%S
file = /var/log/messages
buffer_duration = 5000
log_stream_name = {instance_id}
initial_position = start_of_file
log_group_name = /var/log/messages
[/var/log/http]
datetime_format = %b %d %H:%M:%S
file = /var/log/httpd/error_log
buffer_duration = 5000
log_stream_name = {instance_id}
initial_position = start_of_file
log_group_name = /var/log/httpd
-- INSERT -- 133,32 Bot

Steps


CloudWatch
Dashboards
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ALARM
INSUFFICIENT
OK
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Event Buses
Logs
Insights
Metrics
Settings
Favorites
Add a dashboard
CloudWatch > Log Groups > /var/log/httpd > i-009c84d8ec6e38b8a
Try CloudWatch Logs Insights
CloudWatch Logs Insights allows you to search and analyze your logs using a new, purpose-built query language. Click here to experience it. If you want to learn more, read the AWS blog or visit our documentation.
Expand all
Row
Text
Filter events
all
2019-07-15 (07:24:26)
Time (UTC +05:30)
Message
2019-07-15
No older events found at the moment. Retry.
07:37:47 [Mon Jul 15 02:07:47.206599 2019] [suexec:notice] [pid 12263] AH01232: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
07:37:47 [Mon Jul 15 02:07:47.248282 2019] [lbmethod_heartbeat:notice] [pid 12263] AH02282: No slotmem from mod_heartmonitor
07:37:47 [Mon Jul 15 02:07:47.248323 2019] [http2:warn] [pid 12263] AH10034: The mpm module (prefork.c) is not supported by mod_http2. The mpm determines how things are processed in your server. HTTP/2 has more demands in this rega
07:37:47 [Mon Jul 15 02:07:47.248329 2019] [http2:warn] [pid 12263] AH02951: mod_ssl does not seem to be enabled
07:37:47 [Mon Jul 15 02:07:47.256261 2019] [mpm_prefork:notice] [pid 12263] AH00163: Apache/2.4.39 () configured -- resuming normal operations
07:37:47 [Mon Jul 15 02:07:47.256284 2019] [core:notice] [pid 12263] AH00094: Command line: '/usr/sbin/httpd -D FOREGROUND'
07:41:44 [Mon Jul 15 02:11:44.439331 2019] [mpm_prefork:notice] [pid 12263] AH00170: caught SIGWINCH, shutting down gracefully
2019-07-16
07:24:26 [Tue Jul 16 01:54:26.205795 2019] [suexec:notice] [pid 3075] AH01232: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
07:24:26 [Tue Jul 16 01:54:26.233418 2019] [lbmethod_heartbeat:notice] [pid 3075] AH02282: No slotmem from mod_heartmonitor
07:24:26 [Tue Jul 16 01:54:26.233472 2019] [http2:warn] [pid 3075] AH10034: The mpm module (prefork.c) is not supported by mod_http2. The mpm determines how things are processed in your server. HTTP/2 has more demands in this regard
07:24:26 [Tue Jul 16 01:54:26.233477 2019] [http2:warn] [pid 3075] AH02951: mod_ssl does not seem to be enabled
07:24:26 [Tue Jul 16 01:54:26.242337 2019] [mpm_prefork:notice] [pid 3075] AH00163: Apache/2.4.39 () configured -- resuming normal operations
07:24:26 [Tue Jul 16 01:54:26.242358 2019] [core:notice] [pid 3075] AH00094: Command line: '/usr/sbin/httpd -D FOREGROUND'
08:06:15 [Tue Jul 16 02:36:15.721416 2019] [mpm_prefork:notice] [pid 3075] AH00170: caught SIGWINCH, shutting down gracefully
2019-07-17
07:09:22 [Wed Jul 17 01:39:22.651149 2019] [suexec:notice] [pid 3049] AH01232: suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
07:09:22 [Wed Jul 17 01:39:22.679360 2019] [lbmethod_heartbeat:notice] [pid 3049] AH02282: No slotmem from mod_heartmonitor
07:09:22 [Wed Jul 17 01:39:22.679412 2019] [http2:warn] [pid 3049] AH10034: The mpm module (prefork.c) is not supported by mod_http2. The mpm determines how things are processed in your server. HTTP/2 has more demands in this regard
07:09:22 [Wed Jul 17 01:39:22.679417 2019] [http2:warn] [pid 3049] AH02951: mod_ssl does not seem to be enabled
07:09:22 [Wed Jul 17 01:39:22.688309 2019] [mpm_prefork:notice] [pid 3049] AH00163: Apache/2.4.39 () configured -- resuming normal operations
07:09:22 [Wed Jul 17 01:39:22.688335 2019] [core:notice] [pid 3049] AH00094: Command line: '/usr/sbin/httpd -D FOREGROUND'
No newer events found at the moment. Retry.