Monitoring

Objectives

At the end of this module, you will be able to use:

- Aerospike Management Console
- asmonitor
- asloglatency

Aerospike Management Console (AMC)

Aerospike Management Console (AMC)

The AMC is a web interface to managing/monitoring the Aerospike database.

- Cluster summary
- Node info
- Storage info
- Definitions
- Jobs
- Alerts
- Cross Datacenter Replication (XDR) stats
- Latency stats
- Backup/restore
- Edit configuration

AMC Community Edition is for Monitoring only.
AMC Enterprise Edition includes management functions.

This class is intended for AMC Community Edition, but we do cover a few Enterprise Edition features.

AMC - Dashboard

The AMC Dashboard provides many of the high level health statistics. This is often used in NOCs to see if there are any problems with the Aerospike clusters.

A listing of different plug-ins is also available at:

http://www.aerospike.com/docs/operations/monitor/

AMC – Dashboard (top)

This interface is sometimes used in NOCs.

From the TOP:

- The Disk and RAM usage are marked in blue as a fraction of the total available space.

- The Cluster Summary shows the number of nodes (total) as well has how many are up (GREEN) and down (RED), a count of the number of namespaces, and the current build number. Be careful as it is possible that individual nodes may be on a different version.

- The Alerts Activity panel is only available in the Enterprise Edition. It is missing in the Community Edition.

AMC – Dashboard (bottom)
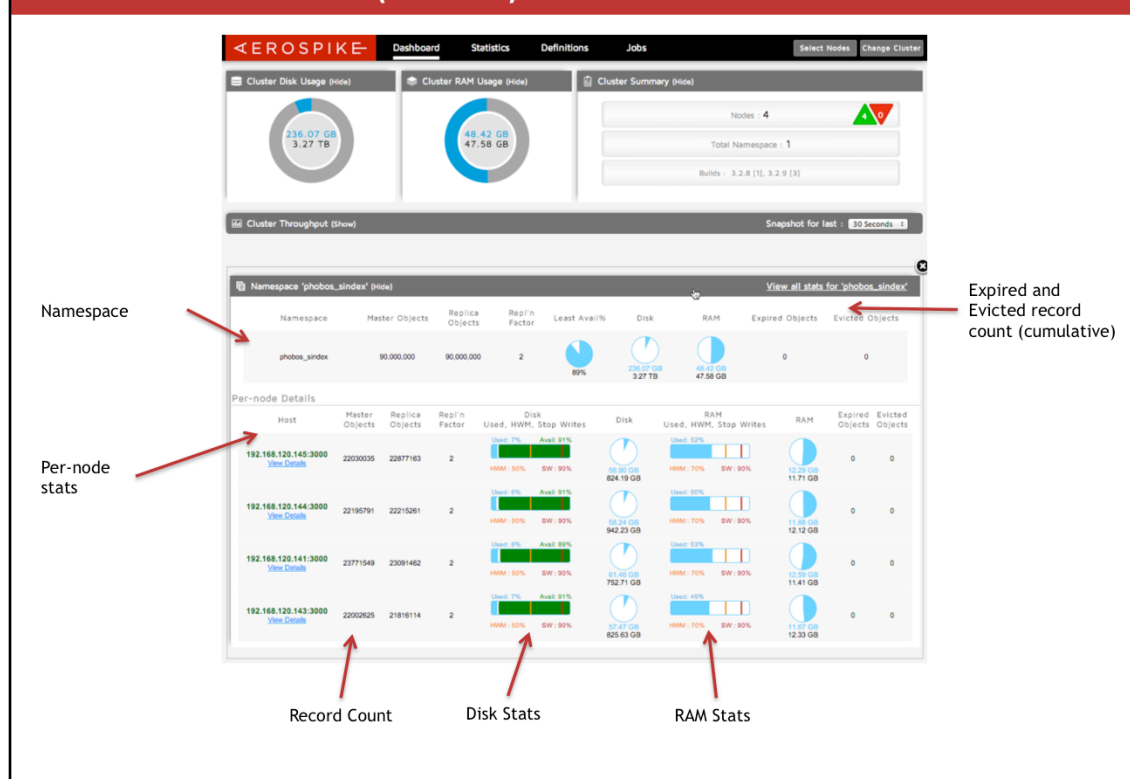
In the Namespace panel, you see the high level information for each namespace.

The Per-node section will show the detail for each node in the cluster.

One special thing to note is that the expired and evicted record counts are cumulative, so you should look at the number increasing rather than the static value.

AMC - Statistics

The statistics page shows all statistics and configuration variables related to:

- Nodes
- Namespaces
- Secondary Indexes

These statistics show how these are being used.

These interfaces can be used to quickly find where there are differences in the cluster.

AMC – Statistics: Nodes

You can quickly find differences between different nodes. While this is not always an indication of a problem, you can quickly find where the differences are.

There are hundreds of values. So if you know what value you want, enter in a search string in box (3) and hit enter. It will filter on just the ones that match the pattern.

Very similar to the Nodes, the Namespaces page shows statistics for the namespaces. You must select the namespace (3).

You can also see the attributes for secondary indexes. In this case you must select both the namespace and the secondary index (3).

AMC - Definitions

The Definitions page shows how the following are defined:

- Namespaces
- User Defined Functions (UDFs)

AMC – Definitions: Namespaces

On the Definitions: Namespaces page, you can see statistics for Secondary Indexes, Sets, and what storage is attached to the namespace.

Of particular importance for Secondary Indexes is whether or not the index is synchronized on all nodes. This refers to Secondary Indexes only. If they are not synchronized, queries based on the secondary index will fail with an error.

AMC – Definitions: User Defined Functions
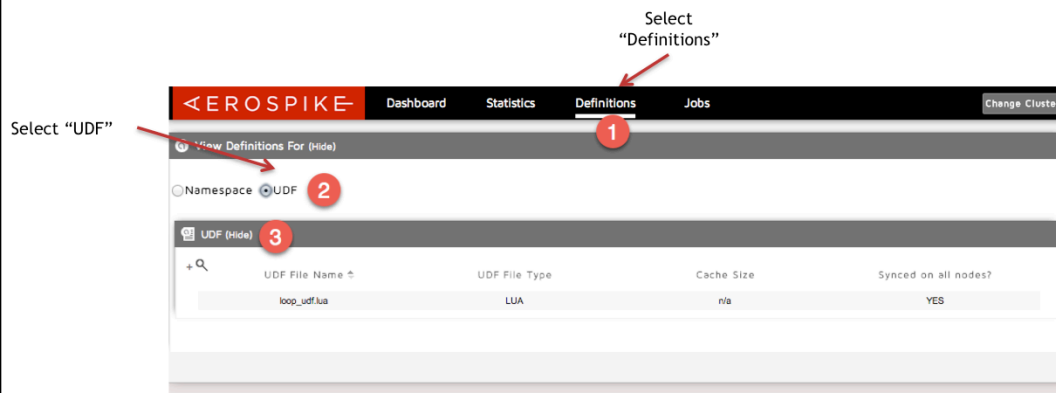
User Defined Functions (UDFs) are code that are run on the Aerospike server rather than the client (similar to stored procedures).

UDFs are managed automatically by the Aerospike database, but must be registered. Once it has been registered, it will be internally distributed to all nodes in the cluster. If there has been a problem the the "Synced on all nodes?" column will show "NO"

AMC - Jobs

The Jobs page allows you to see what jobs are currently running on the server.

Because most queries are fast, you will only be able to see very long running ones.

AMC – Jobs

Jobs like scans and queries may show up in the Jobs page. Be aware that many queries are very short duration and may not show up on this interface.

AMC – Admin Console
Enterprise Edition Only

The AMC admin console gives you added functionality to manage a cluster.

- Backup a cluster
- Restore a cluster
- Dynamically change configuration node variables
- Dynamically change configuration namespace variables
- View Cross Datacenter Replication (XDR) stats
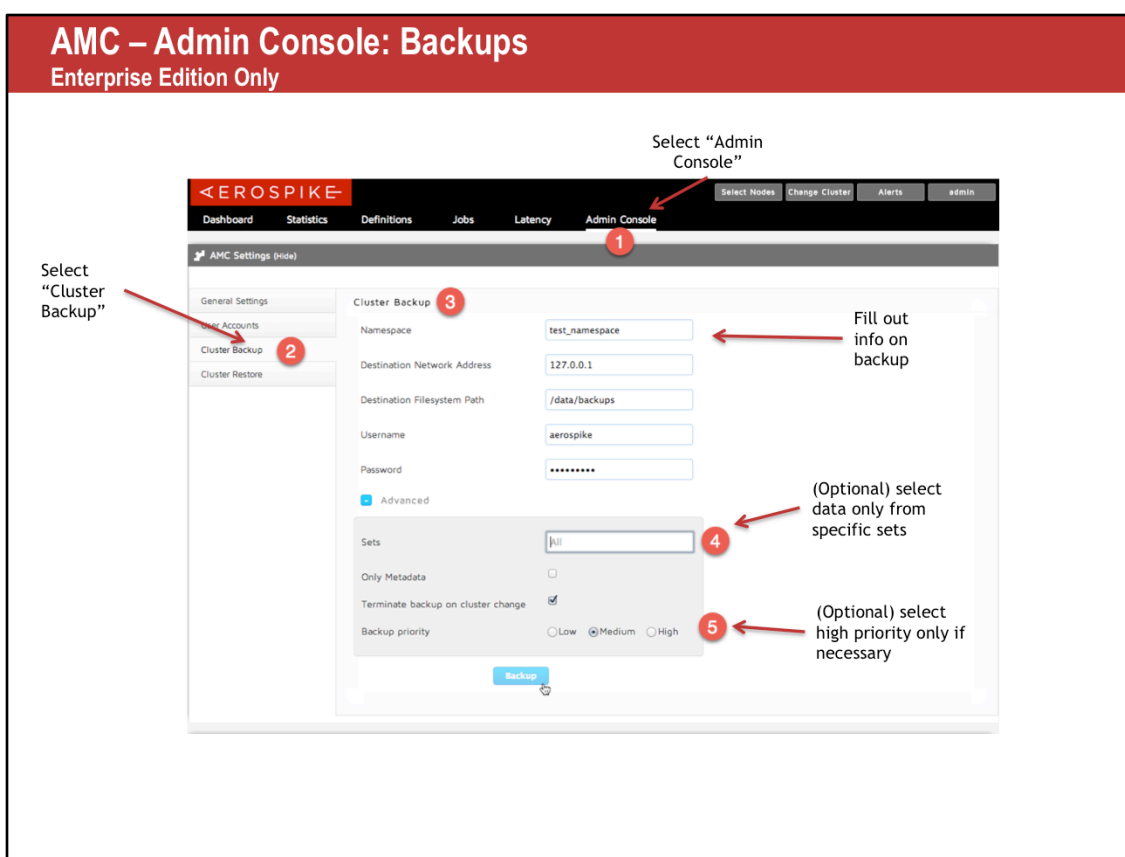
Backups are done on a namespace by namespace basis and will be done on the AMC server.

The export will be in human readable format, but is not consistent. It is possible for a record to appear more than once. This normally fixes itself during the restore process. But if you will be importing the backup file into another system you should know that records may have multiple entries with different generations.

As an option, you can specify to only backup specific sets.

We generally recommend using medium priority, which places a lower load on the cluster, but still should complete in a reasonable time. Use "High" if you must have the backup and are willing to take the risk of them impacting traffic. Use "Low" if you don't want to impact traffic and are ok with the backup taking a long time.

Performance will depend on how much data, how many nodes, etc, but it will take a long time.

AMC – Admin Console: Restore
Enterprise Edition Only

The restoration works in reverse of the backup.

One important note is that if you are restoring because an application error has lead to corruption of data, you can select to "Ignore Generation Number". This will let you restore the old data without wiping out everything. Otherwise, you will usually want to leave this unselected.

AMC – Admin Console: Change Node Variables
Enterprise Edition Only

Select "Admin Console"

Select "Nodes"

Edit variables

Changes will be made dynamically (if possible) to all nodes in the cluster.

With the Enterprise Edition AMC you can make changes to the node configuration dynamically. That is, the AMC can change the value of many variables while the server is still operating.

AMC – Admin Console: Change Namspace Vars
Enterprise Edition Only

You can do likewise dynamically change the Namespace variables.

AMC – Admin Console: Change XDR Vars
Enterprise Edition Only

You can also dynamically alter the XDR variables.

asmonitor

asmonitor

asmonitor is a command line tool used to track the health of an Aerospike cluster.

Typical syntax:

- `asmonitor [-h <host>[:<port>]] [-p <port>]`

This will put you into the asmonitor command line.

While there are other options for the asmonitor, we will just try connecting to an instance.

The asmonitor does not need to be on the same host. You need only give asmonitor one host/IP address and it will connect to the other nodes in the cluster.

Just entering asmonitor without any parameters will put you into the local Aerospike node on port 3000.

asmonitor – Commonly Used Commands

Command: `help`

Displays the full syntax of the asmonitor command.

asmonitor – Commonly Used Commands

Command: `info`

Displays cluster info similar to the dashboard on the AMC.

```
Monitor> info
===NODES===
2014-08-18 16:04:12.503857
Sorting by IP, in Ascending order:
ip:port               Build  Cluster    Cluster  Free  Free  Migrates            Node       Principal  Replicated   Sys
                        .      Size    Visibility Disk   Mem      .                ID              ID      Objects   Free
                        .       .          .      pct   pct      .                                   .         .     Mem
v13.citrusleaf.local   3.3.15     3        true    93    88    (0,0)   BB96CDE06CA0568   BB979DF04CA0568   46,743,148   94
v14.citrusleaf.local   3.3.15     3        true    93    87    (0,0)   BB968DF04CA0568   BB979DF04CA0568   48,463,949   94
v15.citrusleaf.local   3.3.15     3        true    92    87    (0,0)   BB979DF04CA0568   BB979DF04CA0568   48,791,285   94
Number of nodes displayed: 3


 ===NAMESPACE===
Total (unique) objects in cluster for phobos_sindex : 71,999,191
Note: Total (unique) objects is an under estimate if migrations are in progress.


ip/namespace                      Avail  Evicted       Objects   Repl    Stop    Used  Used    Used  Used   hwm   hwm
                                   Pct   Objects         .       Factor  Writes   Disk  Disk     Mem   Mem  Disk   Mem
                                    .       .            .         .       .        .     %       .     %    .     .
v15.citrusleaf.local/phobos_sindex  89       0    23,998,732      2     false   63.92 G    8   2.91 G   13    50    70
v14.citrusleaf.local/phobos_sindex  89       0    24,153,960      2     false   63.49 G    7   2.89 G   13    50    70
v13.citrusleaf.local/phobos_sindex  89       0    23,846,499      2     false   61.24 G    7   2.79 G   12    50    70
Number of rows displayed: 3
```

The most important things to note here are:

- The number of object are replicated.

- If the number of migrates is non-zero, the cluster is in a dynamic state.

- There are counters for the number of evicted objects, if this is increasing, the system is short on configured resources.

asmonitor – Commonly Used Commands

Command: `stat`

Displays node stats for each node in the cluster. Often used with the "-v" flag to filter the output, which can be very long.

```
Monitor> stat -v system
        ====192.168.120.143:3000====
system_free_mem_pct       94
system_swapping        false
        ====192.168.120.144:3000====
system_free_mem_pct       94
system_swapping        false
        ====192.168.120.145:3000====
system_free_mem_pct       94
system_swapping        false
```

There are hundreds of possible variables and just entering "stat" will show all values for all nodes in the cluster.

It is often easier to filter for just the variables you are interested in. Use the "-v" option and a pattern to filter on just those variables.

asmonitor – Commonly Used Commands

Command: latency

Displays latency stats for how long requests take to be filled as measured on the server. This may differ significantly from the client latency measures. There are additional parameters to take a look back at a specific time or gather other metrics. Useful for determining throughput.

```
Monitor> latency
     ====writes_master====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39     995.5   17.42   0.01   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38     995.0   20.90   0.28   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41     988.2   23.39   0.78   0.00

     ====writes_reply====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39     995.5   17.42   0.01   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38     995.0   20.90   0.28   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41     988.2   23.39   0.78   0.00

     ====reads====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39    2296.5    0.85   0.00   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38    2348.2    0.94   0.00   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41    2342.8    0.97   0.00   0.00

     ====udf====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39       0.0    0.00   0.00   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38       0.0    0.00   0.00   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41       0.0    0.00   0.00   0.00

     ====proxy====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39       0.0    0.00   0.00   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38       0.0    0.00   0.00   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41       0.0    0.00   0.00   0.00

     ====query====
                            timespan    ops/sec    >1ms   >8ms   >64ms
192.168.120.143:3000   23:20:29-GMT->23:20:39       0.0    0.00   0.00   0.00
192.168.120.144:3000   23:20:28-GMT->23:20:38       0.0    0.00   0.00   0.00
192.168.120.145:3000   23:20:31-GMT->23:20:41       0.0    0.00   0.00   0.00
```

One of the most commonly used asmonitor commands is to measure latency.

Note that these are latencies as measured on the server, it is not possible to measure the client latencies from the Aerospike nodes. This command also shows the throughput for each node/type.

This command gives you the latencies for all nodes in the cluster for different measures:

writes_master: These are the latency times for responds to writes from the master. Unless you have actively configured for asynchronous writes, this will be the same as the latency to any replica.

writes_reply: These are the latency times for replica writes. This is normally the same as for writes_master, unless you have configured differently.

reads: These are the latency times for reads. Aerospike does reads from a single node.

udf: The latency times for UDFs to run.

proxy: In cases where the cluster state is dynamic (nodes added/removed) it is possible that the node not have the data. Aerospike will automatically proxy the request for the client. These latency times are just for proxied requests.

query: The latency times for queries using secondary indexes.

asmonitor – Commonly Used Commands

Command: `collectinfo (not usually run from the asmonitor command line)`

Sometimes you need to gather information for Aerospike support. This can be done using the collectinfo command. Note that you must have sudo/root privileges.

```
[root@v15 ~]# sudo asmonitor -e "collectinfo"

Enter help for commands

3 hosts in cluster: 192.168.120.143:3000,192.168.120.144:3000,192.168.120.145:3000
Data collection for collect_asdcheck in progress..
Data collection for collect_params in progress..
Data collection for collect_loginfo in progress..
Data collection for collect_readlogs in progress..
sh: line 1: 0: command not found
Data collection for collect_sys in progress..
Data collection for collect_shell in progress..
sh: dpkg: command not found
running shell command: tar -czvf /tmp/as_log_1408404265.16.log.tgz /tmp/as_log_1408404265.16.log
tar: Removing leading `/' from member names
/tmp/as_log_1408404265.16.log


FILE /tmp/as_log_1408404265.16.log and /tmp/as_log_1408404265.16.log.tgz saved. Please send it to support@aerospike.com
END OF ASCOLLECTINFO
```

◁ **asloglatency**

asloglatency

`asloglatency` is a command line tool used find the latency of the server in log files for specific types of transactions.

Typical syntax

```
> asloglatency -h <histogram> -l <log_file> -f <time_from> -d
<duration>
```

Option	Default	Description
-l	/var/log/aerospike/ aerospike.log	Log file to read from. Can be used to read from logs that have been rotated out.
-h	[none]	(required) One of `read`, `writes_master`, `writes_reply`, `udf`, `proxy`, `query`
-t	10	Analysis slice interval in seconds or time format. Time format is "HH:MM:SS"
-f	tail	Time_from may be in either form "Aug 6 2014 22:10:13", "-3600", "-1:00:00". Default is to tail the file.
-d		Maximum duration from which to analyze. Duration is in either form "3600" or "HH:MM:SS"
-n	3	Number of buckets to display.
-e	3	Show the 0-th and then every e-th bucket. Lower numbers show finer granularity. Examples: <table><tr><td>n</td><td>e</td><td>will show (ms)</td></tr><tr><td>3</td><td>3</td><td>1,8,64</td></tr><tr><td>7</td><td>1</td><td>1,2,4,8,16,32,64</td></tr></table>

asloglatency will show the latencies taken from log files. These may be a considerable time in the past. This is very useful for seeing:

- when a problem started
- did the problem occur suddenly or over a long period of time

asloglatency - example

Suppose there was an issue in read latency 12 hours ago that lasted for an hour. You wish to review the read latencies from 12 hours ago to 10 hours ago. You can issue the command:

```
> asloglatency -h reads -f -12:00:00 -d 2:00:00

reads
Aug 6, 2014 01:58:58
% > (ms)
slice-to (sec)      1      8     64  ops/sec
-------------- ------ ------ ------ --------
01:59:08    10   1.13   0.04   0.00   4661.8
01:59:18    10   1.13   0.04   0.00   4661.8
01:59:28    10   1.13   0.04   0.00   4661.8
...
03:58:58    10   1.13   0.04   0.00   4661.8
03:59:08    10   1.13   0.04   0.00   4661.8
-------------- ------ ------ ------ --------
avg              0.97   0.04   0.00   4188.0
max              1.34   0.05   0.00   4661.8
```

Summary

What we have covered:

- Aerospike Management Console
- asmonitor
- asloglatency