motadata

Availability & Reachability Report

Feature Document

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1 Introduction

The availability and reachability reports show the total time duration for which a monitor was up and running; and also the time for which it was accessible to other systems respectively. This reports help you to identify the source of problem. For example is monitor is up but not reachable, it means the link/media is down.

Motadata uses an uptime metric to identify availability time the SNMP monitor. On every poll, monitor sends the total uptime of the device. Motadata uses this information to compute the availability parameters. Motadata shows availability in terms of:

- Total uptime value
- Uptime (%)
- Downtime value
- Downtime (%)

To identify monitor's reachability, Motadata uses the classic ICMP (ping) method. Using the ping information, Motadata computes the reachability time to calculate the total time for which a monitor was reachable. Motadata shows reachability in terms of:

- Reachability uptime (%)
- Reachability uptime
- Reachability downtime (%)
- Reachability downtime
- Maintenance time (%)
- Maintenance time
- Disabled time (%)
- Disabled time
- Unknown time (%)
- Unknown time

1.1 Features

The reports have following features:

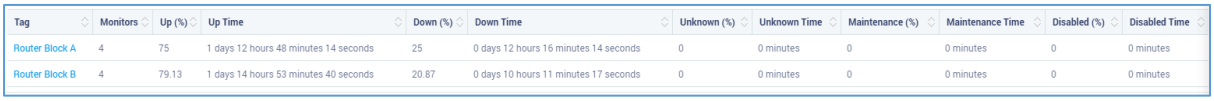
- **Easy create and manage report** - you can create a new report and manage existing reports from the interactive GUI interface.
- **Group monitors** - you can group the monitors and see the aggregated their availability.
- **See only what you want** - you can edit the report and configure the required outputs.
- **Custom time span** - you can choose the duration for which you want to generate the availability of the monitors. Be it for few seconds or many years.
- **Export report** - Download the report into PDF format
- **Notify stakeholders** - Send the updated version of the report at regular intervals using scheduler service.
- **Component specific analysis** - Generate standalone reports for different components and send it to concerned persons.

1.2 Points to Remember

Following are the assumption points:

- Motadata recommends below things for availability report to give optimal results:
  - Polling time should be consistent and not changed over the period of time.
  - Report should be generated for a generous time span and not for short intervals.
- As per the industry standard, the maintenance mode time is not considered while computing the availability of the monitor.
- The polling engine stores some crucial information of the monitors. The change in polling engine will affect the total monitor-availability and link-reachability calculations.
- We have considered that monitor is up and running before the first polling.
- The 'uptime metric' calculates the downtime of the monitor by comparing value at previous poll and current poll. It polls the device and updates the database table. If you restart the device when this metric polls, you may not get the exact computation of downtime.
- The device status such as - disabled or maintenance will affect the reachability up-down percentage.
- When the device goes down just after the link goes down, then the downtime of the link will be added to device's downtime (for both: reachability and availability).
- When a monitor goes down multiple times in between two consecutive success polls, Motadata will calculate the uptime and downtime using the last uptime of the monitor only.

1.3 Sample Reachability Report

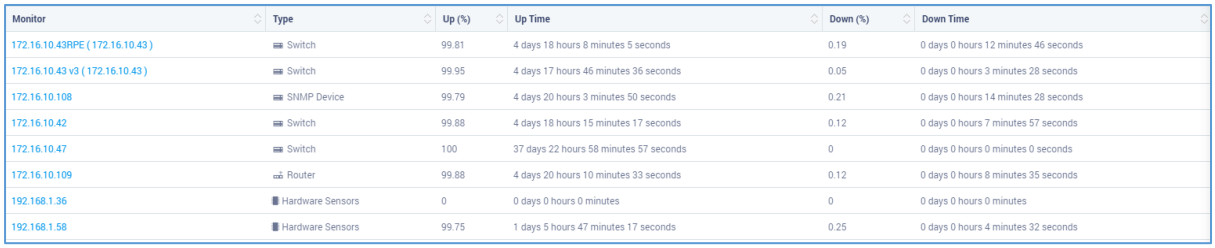


Tag	Monitors	Up (%)	Up Time	Down (%)	Down Time	Unknown (%)	Unknown Time	Maintenance (%)	Maintenance Time	Disabled (%)	Disabled Time
Router Block A	4	75	1 days 12 hours 48 minutes 14 seconds	25	0 days 12 hours 16 minutes 14 seconds	0	0 minutes	0	0 minutes	0	0 minutes
Router Block B	4	79.13	1 days 14 hours 53 minutes 40 seconds	20.87	0 days 10 hours 11 minutes 17 seconds	0	0 minutes	0	0 minutes	0	0 minutes

Column Name	Description
Name	The name of the monitor. If no name is given, IP address/host name is visible here.
Type	Type of the SNMP device.
Up (%)	Total uptime value of monitor in percentage.
Up Time	Total uptime value in days hours minutes and seconds
Down (%)	Total downtime value of monitor in percentage.
Down Time	Total downtime value in days hours minutes and seconds
Unknown (%)	Total unknown time duration of monitor in percentage.
Unknown Time	Total unknown time duration value in days hours and minutes.
Maintenance (%)	Total maintenance time duration of monitor in percentage.
Maintenance Time	Total maintenance time duration value in days hours and minutes.

Disabled (%)	Total disabled time duration of monitor in percentage.
Disabled Time	Total disabled time duration value in days hours and minutes.

1.4 Sample Availability Report



Monitor	Type	Up (%)	Up Time	Down (%)	Down Time
172.16.10.43RPE (172.16.10.43)	Switch	99.81	4 days 18 hours 8 minutes 5 seconds	0.19	0 days 0 hours 12 minutes 46 seconds
172.16.10.43 v3 (172.16.10.43)	Switch	99.95	4 days 17 hours 46 minutes 36 seconds	0.05	0 days 0 hours 3 minutes 28 seconds
172.16.10.108	SNMP Device	99.79	4 days 20 hours 3 minutes 50 seconds	0.21	0 days 0 hours 14 minutes 28 seconds
172.16.10.42	Switch	99.88	4 days 18 hours 15 minutes 17 seconds	0.12	0 days 0 hours 7 minutes 57 seconds
172.16.10.47	Switch	100	37 days 22 hours 58 minutes 57 seconds	0	0 days 0 hours 0 minutes 0 seconds
172.16.10.109	Router	99.88	4 days 20 hours 10 minutes 33 seconds	0.12	0 days 0 hours 8 minutes 35 seconds
192.168.1.36	Hardware Sensors	0	0 days 0 hours 0 minutes	0	0 days 0 hours 0 minutes
192.168.1.58	Hardware Sensors	99.75	1 days 5 hours 47 minutes 17 seconds	0.25	0 days 0 hours 4 minutes 32 seconds

Column Name	Description
Name	The name of the monitor. If no name is given, IP address/host name is visible here.
Type	Type of the SNMP device.
Up (%)	Total uptime value of monitor in percentage.
Up Time	Total uptime value in days hours minutes and seconds
Down (%)	Total downtime value of monitor in percentage.
Down Time	Total downtime value in days hours minutes and seconds

2 Calculation Matrix

2.1 Monitor Reachability

2.1.1 Reachability Uptime/Downtime (%)

Motadata counts the ping response by the monitor to identify the reachability uptime and downtime percentage. For example: in 1 hour Motadata pings the monitor 10 times. Out of 10 ping requests, monitor didn't respond 3 times. So the reachability downtime (%) will be:

$$[Reachability\ Downtime\ \%] = \left(\frac{3}{10}\right) * 100 = 30\%$$

In generalized form:

$$[Reachability\ Downtime\ \%] = \frac{[Count\ of\ failed\ ping\ response] * 100}{[Total\ count\ of\ ping\ request]}$$

Hence, the reachability uptime % can be computed as:

[Reachability Uptime %] = 100 - [Reachability Downtime %]

2.1.2 Reachability Uptime

Motadata calculates the reachability uptime using the reachability uptime %. Using above example, the monitor was not reachable for 30% time in 1 hour. Means reachability uptime was 70% for 1 hour. Hence, the reachability uptime is:

$$Rechability\ uptime = \frac{1\ hour * 70}{100} = 0.7\ hours = 42\ minutes.$$

In generalized form:

[Reachability Uptime] = [Total Time] x [Reachability uptime (%)]/100

2.1.3 Reachability Downtime

Motadata calculates the reachability downtime using the reachability downtime %. Using above example, the monitor was not reachable for 30% time in 1 hour. Hence, the reachability uptime is:

$$Rechability\ downtime = \frac{1\ hour * 30}{100} = 0.3\ hours = 18\ minutes.$$

In generalized form:

[Reachability Downtime] = [Total Time] x [Reachability downtime (%)]/100

2.1.4 Maintenance (%)

Similar to the reachability uptime/downtime %, the maintenance time % is computed using the count of maintenance flag. For example: In 1 hour, Motadata has

to ping the monitor 10 times. Out of it, for 3 times, the monitor was in maintenance mode. Hence, the maintenance time (%) will be:

$$[Maintenance\ \%] = \left(\frac{3}{10}\right) * 100 \ = \ 30\%$$

In generalized form:

$$[Maintenance\ \%] = \frac{[Count\ of\ maintenace\ flag] * 100}{[Total\ count\ of\ ping\ request]}$$

2.1.5 Maintenance Time

Motadata calculates the maintenance time using the maintenance time %. Using above example, the monitor was in maintenance mode for 30% time in 1 hour. Hence, the maintenance time is:

$$Maintenance\ time = \frac{1\ hour * 30}{100} = 0.3\ hours = 18\ minutes.$$

In generalized form:

[Maintenance Time] = [Total Time] x [Maintenance Time (%)]/100

2.1.6 Disabled Time (%)

Similar to the reachability uptime/downtime %, the disabled time % is computed using the count of disabled flag. For example: In 1 hour, Motadata has to ping the monitor 10 times. Out of it, for 3 times, the monitor was in disabled mode. Hence, the maintenance time (%) will be:

$$[Disabled\ \%] = \left(\frac{3}{10}\right) * 100 \ = \ 30\%$$

In generalized form:

$$[Disabled\ \%] = \frac{[Count\ of\ disabled\ flag] * 100}{[Total\ count\ of\ ping\ request]}$$

2.1.7 Disabled Time

Motadata calculates the disabled time using the disabled time %. Using above example, the monitor was in disabled mode for 30% time in 1 hour. Hence, the disabled time is:

$$Disabled\ time = \frac{1\ hour * 30}{100} = 0.3\ hours = 18\ minutes.$$

In generalized form:

[Disabled Time] = [Total Time] x [Disabled Time (%)]/100

2.1.8 Unknown (%)

Similar to the reachability uptime/downtime %, the unknown time % is computed using the count of unknown flag. For example: In 1 hour, Motadata has to ping the monitor 10 times. Out of it, for 3 times, the monitor was in unknown mode. Hence, the unknown time (%) will be:

$$[Unknown\ \%] = \left(\frac{3}{10}\right) * 100\ =\ 30\%$$

In generalized form:

$$[Unknown\ \%] = \frac{[Count\ of\ unknonw\ flag] * 100}{[Total\ count\ of\ ping\ request]}$$

2.1.9 Unknown Time

Motadata calculates the unknown time using the unknown time %. Using above example, the monitor was in unknown mode for 30% time in 1 hour. Hence, the unknown time is:

$$Unknown\ time = \frac{1\ hour * 30}{100} = 0.3\ hours = 18\ minutes.$$

In generalized form:

[Unknown Time] = [Total Time] x [Unknown Time (%)]/100

2.2 Monitor Availability

For availability calculations, Motadata uses 'uptime metric'. This metric fetch the latest uptime value from the monitor. Motadata uses the uptime value and uses it to calculate the availability downtime. There can be a **variance** in computation of downtime. Consider the following example:

Basic Info: The Motadata polls the monitors in every 5 minutes starting at 00:00:00.

Polling Time	Up Time	Remark
7/2/2019 15:00:00	38 days 15 hour 0 minute 0 seconds	Device was up since 1st Jan 2019 00:00:00
7/2/2019 15:05:00	38 days 15 hour 5 minute 0 seconds	Device was up since 1st Jan 2019 00:00:00
7/2/2019 15:10:00	--NA--	Device went down at 15:07:00 hence polling didn't happen at this interval
7/2/2019 15:15:00	0 day 0 hour 2 minute 0 seconds	Device came up on 15:13:00 hence uptime is 2 minutes.
7/2/2019 15:20:00	0 day 0 hour 7 minute 0 seconds	

Note that: In above scenario, we will get the downtime of 8 minutes (while actual downtime is 6 minutes.). This is because from 15:05:00 (when the monitor was last polled) to 15:07:00 (when the monitor went down), the 2 minutes are lost.

2.2.1 Total Time

[Total Time] = [Sum of total uptime + total downtime]

2.2.2 Availability Uptime

[Availability Uptime] = [Total Time] - [Availability Downtime]

2.2.3 Availability Uptime (%)

[Availability Uptime (%)] = 100 - [Availability Downtime (%)]

2.2.4 Availability Downtime

[Availability Downtime] = [Sum of all Downtime records]

2.2.5 Availability Downtime (%)

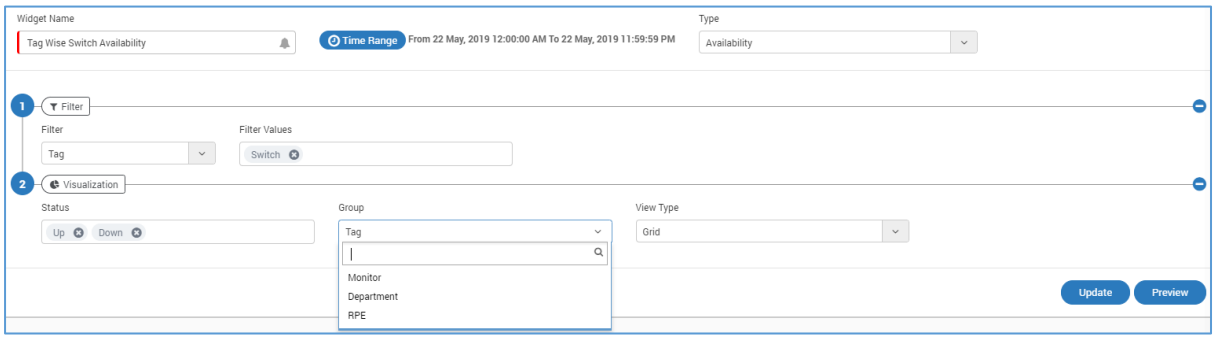
[Availability Downtime (%)] = 100 x [Availability Downtime]/[Total Time]

Note: Report data will change according to the time duration selected.

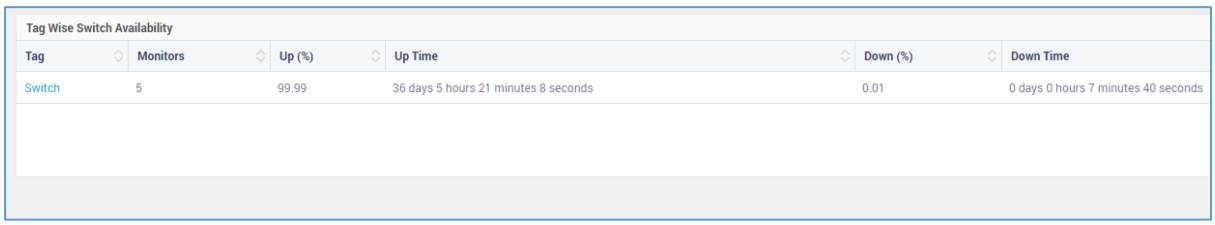
2.3 Monitor Groups Availability Report

You can group the monitors based on:

- Tags
- Monitor
- Department
- RPE



The output will be:



To see the calculation, let's consider following example:

Suppose there are 5 monitors and each has its own uptime and downtime values:

Switch Availability

Monitor	Type	Up (%)	Up Time	Down (%)	Down Time
172.16.10.46	Switch	100	12 days 0 hours 20 minutes 49 seconds	0	0 days 0 hours 0 minutes 0 seconds
172.16.10.42	Switch	97.42	0 days 2 hours 8 minutes 46 seconds	2.58	0 days 0 hours 3 minutes 25 seconds
172.16.10.43	Switch	96.89	0 days 2 hours 12 minutes 12 seconds	3.11	0 days 0 hours 4 minutes 15 seconds
172.16.10.45	Switch	100	12 days 0 hours 20 minutes 7 seconds	0	0 days 0 hours 0 minutes 0 seconds
172.16.10.47	Switch	100	12 days 0 hours 19 minutes 14 seconds	0	0 days 0 hours 0 minutes 0 seconds

Then total up time will be:

$$Sum\ of\ up\ time\ values\ of\ all\ monitors$$

The total down time will be:

$$Sum\ of\ down\ time\ values\ of\ all\ monitors$$

Total time will be:

$$Sum\ of\ up\ time\ and\ down\ time\ values\ of\ all\ monitors$$

Total up time % will be:

$$\left(Total\ \frac{up\ time}{total\ time}\right) * 100$$

Total down time % will be:

$$\left(Total\ \frac{down\ time}{total\ time}\right) * 100$$

Appendix - Time Averaging

Generally in practical scenarios, the polling time of monitors differ from each other. One monitor polls at say 12:02 PM while other polls at 12:03 PM. While creating a reachability uptime report for such monitors, there lies a gap between the asked time frame and their poll times.

To compensate the gap in asked time frame and monitor's first poll in given time range, system uses 'averaging' concept. The concept is based on the following consideration:

- Is the monitor available before and after the given time period? If yes, then system considers the asked period in uptime calculations. Else, it considers the actual polling duration.

Parameter	Value
Report Period	12:00 PM - 1:00 PM
Monitor poll time and cycle	12:03 PM and 6 minutes cycle
First poll time considered for report	12:03 PM
End poll time considered for report	12:57 PM
Availability of monitor before 1st poll	Yes at 11:57 AM
Availability of monitor at last poll	Yes at 1:03 PM

If the monitor is available before and after the report period, system will consider the whole 1 hour for reachability duration. For the gap of 3 minutes between 12:00 PM and 12:03, system assumes that since monitor is available, it is reachable also. Similarly for the gap between 12:57 PM and 1:00 PM, system assumes that since monitor is available, it is reachable also.

In another scenario if the monitor is not available at 11:57 PM, system will consider the first poll at 12:03 PM and report will be generated for 57 minutes. There will be a difference of 3 minutes in asked time period and sum of reachability uptime + downtime.

Some Other Considerations

- The devices discovered in between the time of consideration will result in miscalculation in report.
- If any device under consideration fails to poll, it will considered as 'down' for report calculations.

Keep in touch

www.motadata.com, sales@motadata.com,

India: +91 79-2680-0900, USA: +1 408-418-5229

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