



# APPLICATION NOTE FOR DISK SPACE REQUIREMENTS AARENET VOICE SYSTEMS



Author: Aarenet

Version: 1.0

Aarenet AG, Meriedweg 11

CH-3172 Niederwangen

T +41 31 980 28 11, F +41 31 980 28 12

[www.aarenet.com](http://www.aarenet.com), [info@aarenet.com](mailto:info@aarenet.com)



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# 1 Introduction

## 1.1 Purpose of this documentation

This document describes the Aarenet Application Note for disk space requirements and recommended configuration and usage. This helps customers on daily operating Aarenet system.

This document will be handed over to the customer based on a specific request.

## 1.2 Target Audiences

This procedure is aimed at the following audience:

- Team Project leader at the Customer site
- Technical responsible Engineer at the Customer site
- Aarenet Operations Manager
- Aarenet Engineer

## 1.3 Document Conventions

<b>Note</b>	Helpful tips or refer to information which is not included in this document.
<b>Warning</b>	Warnings to situations which may cause danger of injury, device damage or data loss. Warnings to situations which may cause interruptions of the telephony service for the subscriber.
<b>Configuration</b>	Tip for configuration situation which is not intuitively recognizable.
<b>Version</b>	Tip for situation which is dependent on the Aarenet VoIP System software version.

## 1.4 Obtaining Documentation and SW Application

This documentation can be requested from Aarenet Inc support by emailing to: [helpdesk.apac@aarenet.com](mailto:helpdesk.apac@aarenet.com)

Referenced SW applications which are not downloadable online can be requested from Aarenet Inc support by emailing to: [helpdesk.apac@aarenet.com](mailto:helpdesk.apac@aarenet.com)

## 1.5 Feedback

Comments, suggestions and so on can be reported to Aarenet Inc by emailing to: [helpdesk.apac@aarenet.com](mailto:helpdesk.apac@aarenet.com)

## 2 Basic information

### 2.1 Disk space requirements overview

The Aarenet Voice system is designed with the capability to store logs for all operating modules to ensure that the system has complete information to record the operational process of the system during operation.

Depending on the needs and processing capacity of the system, the calculation of using HDD for servers is calculated and used in a reasonable way.

The calculation of the HDD capacity used for each server depends on each type of service provided and the number of simultaneous calls used.

### 2.2 Aarenet voice system logs

In the Aarenet voice system, Aarenet generates the logs in all components:

- Load balancer log
  - Store all log of module load balancer
  - Store location : # /var/log/loadbalancer/logs ( store in LB server)
  - File name and sizing :

```
loadbalancer comp 51M May 5 15:37 loadbalancer.log.6
loadbalancer comp 51M May 7 05:48 loadbalancer.log.5
loadbalancer comp 51M May 8 19:38 loadbalancer.log.4
```
- Media center log
  - Store all log of module media center, process IVR, voice mail...
  - Store location : # /var/log/mediacenter/
  - File name and sizing :

```
mediacenter comp 51M Apr 8 04:26 mediacenter.log.4
mediacenter comp 51M Apr 18 12:41 mediacenter.log.3
mediacenter comp 51M Apr 28 22:19 mediacenter.log.2
mediacenter comp 51M May 9 07:42 mediacenter.log.1
```



- Media server log
  - Store all log of RTP media
  - Store location : `#/var/log/mediaserver` ( store in Media Serve)
  - File name and sizing : 100M for each file

```
mediaserver comp 96M Mar 19 02:51 mediaserver.log.3
mediaserver comp 96M Apr 9 01:57 mediaserver.log.2
mediaserver comp 96M Apr 29 13:55 mediaserver.log.1
mediaserver comp 63M May 13 11:38 mediaserver.log
```

- Service center log
  - Store all log of SIP calls
  - Store location : `#/var/log/servicecenter/` ( Service Center Server)
  - File name and sizing : 11M for one file
  - Number of log file : default is 10 but can be change

```
servicecenter comp 11M Jan 25 12:04 support.log.7
servicecenter comp 11M Feb 7 07:43 support.log.6
servicecenter comp 11M Feb 21 09:44 support.log.5
servicecenter comp 11M Mar 9 19:15 support.log.4
servicecenter comp 11M Mar 23 11:33 support.log.3
servicecenter comp 11M Apr 25 11:54 support.log.2
servicecenter comp 11M May 11 13:53 support.log.1
servicecenter comp 9.4M May 13 11:41 support.log
```

- Config center log
  - Store all log of when configure Aarenet system.
  - Store location : `#/var/log/configcenter` in Management Server
  - File name and sizing :

```
configcenter comp 51M Mar 24 12:14 configcenter.log.4
configcenter comp 51M Apr 8 02:37 configcenter.log.3
configcenter comp 51M Apr 24 23:41 configcenter.log.2
configcenter comp 51M May 12 11:36 configcenter.log.1
```

- Admin center log
  - Store all log of web portal Admin Center when config is changing.
  - Store location : `# /var/log/admincenter`  
File name and sizing : 51M for one file, limit 10 files



```
admincenter comp 51M Dec 22 05:26 admincenter.log.4
admincenter comp 51M Dec 22 18:33 admincenter.log.3
admincenter comp 51M Feb 16 14:10 admincenter.log.2
admincenter comp 51M Apr 6 18:34 admincenter.log.1
```

- Data access center log
  - Store all log of API DAML
  - Store location : # /var/log/dataaccesscenter
  - File name and sizing: 51M for one file, limit 10 files

```
dataaccesscenter comp 51M Dec 22 05:36 dataaccesscenter.log.3
dataaccesscenter comp 51M Dec 30 16:14 dataaccesscenter.log.2
dataaccesscenter comp 51M Apr 14 15:08 dataaccesscenter.log.1
dataaccesscenter comp 20M May 13 11:47 dataaccesscenter.log
```

- Rating center log
  - Store all log billing call with CDR
  - Store location: # /var/log/ratingcenter
  - File name and sizing : limit 20 file

```
ratingcenter comp 51M Feb 20 03:14 ratingcenter.log.8
ratingcenter comp 51M Mar 3 14:50 ratingcenter.log.7
ratingcenter comp 51M Mar 15 01:06 ratingcenter.log.6
ratingcenter comp 51M Mar 26 12:41 ratingcenter.log.5
ratingcenter comp 51M Apr 6 21:56 ratingcenter.log.4
ratingcenter comp 51M Apr 18 09:15 ratingcenter.log.3
ratingcenter comp 51M Apr 29 20:47 ratingcenter.log.2
ratingcenter comp 51M May 11 08:35 ratingcenter.log.1
ratingcenter comp 18M May 13 11:49 ratingcenter.log
```

- Store cdr files : #/home/ratingcenter/cdrs/
- File name and sizing:

```
ratingcenter ratingcenter 488M May 9 23:59 aar_cdr_2023-05-09.csv
ratingcenter ratingcenter 457M May 10 23:59 aar_cdr_2023-05-10.csv
ratingcenter ratingcenter 414M May 11 23:59 aar_cdr_2023-05-11.csv
ratingcenter ratingcenter 399M May 12 23:59 aar_cdr_2023-05-12.csv
```



- Data Base log
  - Store all DB log
  - Store DB configuration
  - Store location: Data Base server:
- DBX log
  - Store all CDR records in last 1 month ( can be change as requirements)
  - Store the bin log files
  - Store location: Management Server
- Log xymon monitoring system status
  - Store all event Aarenet systems, all components
  - Store location: #/var/logs/xymon/

All of log files can customize as size and number of files during operation.

**Note**

Aarenet voice system is design with option below.

- Aarenet voice system with 2 servers
- Aarenet voice system with 12 servers

The log of components is store in the server which install this component



## 3 Sample scenario logs sizing

When calls are processed, all Aarenet modules log all of the processes that are related to the calls. For example, for one SIP call, Aarenet will increase SIP logs with basic information by approximately 1.5 KB in SC ( support log ), 10KB in a minute in Xymon MS and 1.00 KB in all other components not important as LB, media server depend by the duration of this call.

We will also use the following assumptions for the sake of simplicity:

- The average call duration is around 5 minutes.
- There are 4,000 registered phones an average re-registration period of 5 minutes
- Aarenet voice system store all logs activities in all components
- Database set stores the CDR in the last 1 month ( 30 days)
- There are 2,000 Erlang/cc calls, and the system will process 1,411,000 calls per day. It depends on the service provided.

With the assumptions described above, we can estimate how much disk space is needed to process calls per day, including every failed call, all module logs, and DBX store CDR.

### 3.1 Service Center logs and Xymon (monitoring) logs and sizing

Therefore, the Aarenet log of 2,000 erlang/cc is:

- Log SC:  $1.411.000 \text{ calls per day} * 1.5\text{KB} = 2,12 \text{ GB}$  for one day.
  - o In order to storage in 30 days. We would need 63,6 GB on SC Servers.
- Log Xymon:  $10\text{KB} * 60 \text{ Minutes} * 24 \text{ hours} = 14.4 \text{ MB}$  for one day.
  - o In order to storage in 30 days. We would need 432 MB on MS Servers.
- Log all other components as a media center, admin center, config center and data access center is small, around 10 MB per day.

#### Note

The log calls is only store the basic call information, not all detail of SIP message.

If customer wants to store all of detail call logs, they have to prepare the external storage and get all of the call logs files daily.

## 3.2 Database server logs and sizing

Aarenet has 2 Databases, one stores the configuration, and one is DBX for storing CDR.

With the database where Aarenet stores the configuration, the sizing is dependent on the number of accounts, expired log days (default is 7 days) and the binary logs file configuration ( default 1G for one file).

With the database DBX, where Aarenet stores the CDR, the sizing and logs, are depending on how many calls per day and how long we need to keep the CDR in DB.

Each CDR takes up about 1.5 KB of Database space.

Aarenet system produces at least 1 CDR for each call. The number of CDR produced depends on the call scenario and can reach up to 5-7 or even more CDR for different situations such as call forwarding, IVR, or call distribution...

With each CDR's recommendation setting and sizing, Aarenet has recommendations below.

- Aarenet setting for keeping the cdr for the previous 30 days
- Bin log files are 1GB for each file and stored in 7 days

Using the figures and assumptions described above, we can estimate the disk space that will be consumed to process 2000 erlang/cc, the database server as:

Total space for one day is  $1.411.000 \text{ calls per day} * 1.5\text{KB} \approx 2,12\text{GB}$ .

Total space for 30 days is  $2,12\text{GB} * 30 \approx 63,60 \text{ GB}$ .

In case, applied the successful ratio is 50%, the total space for 2000 erlang/cc would need  $63,60 \text{ GB} / 2 = 31,8 \text{ GB}$  for 30 days.

## 4 Summary

Aarenet Softswitch for one month with 2000 Erlang/cc, and the success ratio is 50%, we need the space on Aarenet SoftSwitch's Hardware HDD as follows:

Storage for 30 days

STT	Log type	Sizing	Number of Calls based on 2000 Erlang/cc	Number of Day	Success Ratio	Storage (KB)	Storage (GB)
1	Log Database CDR	1,5 KB	1.411.000	30	50%	31,800,000	31.8
2	Log Xymon	14,400 KB		30	n/a	432,000	0.432
3	Log Service Center	1,5 KB	1.411.000	30	n/a	63,600,000	63,6
4	OS and Aarenet Softswitch Software Package	20GB		30	n/a	20,000,000	20
<b>Total (GB)</b>							<b>115.832</b>

With the customer requirement for storage logs for at least 3 months (91 days) with 1700 Erlang/cc and the success ratio being 100%, we need the space on Aarenet SoftSwitch's Hardware HDD as follows:

Storage for 91 days

- Log Database CDR: sizing 1,5KB x 1,200,000 calls  $((1700 \cdot 1.411.000) / 2000) \cdot 91 \text{ days} \cdot \text{Success ratio } 100\% = 163,8\text{GB}$
- Log Xmon: sizing 14,4MB x 91 days = 1,3104GB
- Log Service Center: sizing 1,5KB x 1,200,000 calls  $((1700 \cdot 1.411.000) / 2000) \cdot 91 \text{ days} = 163,8\text{GB}$
- OS and Aarenet SoftSwitch Software Package: 20GB
- Total: 348.91GB

STT	Log type	Sizing	Number of Calls based on 1700 Erlang/cc	Number of Day	Success Ratio	Storage (KB)	Storage (GB)
1	Log Database CDR	1,5 KB	1,200,000	91	100%	163,800,000	163.8
2	Log Xymon	14,400 KB		91	n/a	1,310,400	1.3104
3	Log Service Center	1,5 KB	1,200,000	91	n/a	163,800,000	163.8
4	OS and Aarenet Softswitch Software Package	20GB		91	n/a	20,000,000	20
<b>Total (GB)</b>							<b>348.91</b>