Dimensionnement materiel

Introduction

The data in this page is provided for information purposes only. Usage may vary for a same number of users, depending on hardware structure and use habits. Many factors can affect usage: email volume, email size, number of recipients, number of events, event scheduling, etc.

On this page:

Related:

About units

Several BlueMind components use up resources. A typical "per user" calculation cannot be applied because a user who only uses messaging will not generate the same load for the system as a user using messaging and collaborative services (Calendar, etc.) and a smartphone.

As a result, sizing is calculated "per unit", on the following basis:

User profile	Units
Messaging only	1
Messaging + intense collaborative use	2
Messaging + collaborative services + smartphone	5

Also, for a same amount of units, a use of messaging only won't consume the same amount of resources as a messaging+collaborative use: unlike collaborative tools, messaging, for example, is more heavily dependent on IO than on CPU.

CPU

CPU is stated in number of cores. Reference values are based on recent Xeon-type CPU.

BlueMind has several services, as a result we recommend a minimum of 2 cores.

Please note that too much CPU can lead to other issues on virtualized environments (https://techan.fr/problemes-de-performance-sur-vmware-du-a-du-cpu-ready.html)

Units	Number of core(s)
1-200	2
200-1000	4
1000-2000	6
2000-3000	8
3000-6000	12
6000+	2 / 1000 units

RAM

Units	RAM
1-250	16 GB
250-1000	24 GB
1000-2500	32GB
2500-5000	48GB
5000-10,000	64GB*
10,000+	96GB*

**With the Cyrus service and bm-elasticsearch on dedicated servers*

Storage / IO Performance

> **Disques et performance**
>
> Un messagerie sollicite beaucoup les disques, pour la lecture et l'écriture de petits fichiers, mais aussi pour tous les traitements sur les messages (indexation, état de lecture, etc...). La qualité des disques et leur rapidité est une donnée clé d'une messagerie performante.

> IOPS = "Input/Output Operations Per Second"

The messaging service is a heavy user of IO, as a result storage is sized in IOPS . As for storage space, it depends on client requirements (quotas, etc.)

Performances minimales des disques

Le stockage est dimensionné en IOPS, un service de messagerie étant un gros consommateur d'IO. L'espace de stockage est lui directement dépendant de la demande du client (quotas,..)

Selon l'usage final, tous les disques n'ont pas nécessairement besoin d'avoir le même niveau de performance. Voici les IOPS minimum pour toute installation :

point de montage	description	type		IOPS minimum
		NFS	block device	
/var/lib/postgresql	Base de données PostgreSQL	✗	✓	10 000 iops
/var/spool/cyrus/meta	meta données des e-mail	✗	✓	10 000 iops
/var/spool/cyrus/data	emails	✗	✓	6 000 iops
/var/spool/bm-hsm	emails archivés	✓	✓	6 000 iops
/var/spool/bm-elasticsearch	index de recherche	✗	✓	10 000 iops
/var/spool/bm-mail	envoi des emails via EAS/mapi ~2Go	✓	✓	6 000 iops
/var/log	logs (fichiers journaux)	✓	✓	6 000 iops
/var/backups/bluemind	sauvegardes	✓	✓	6 000 iops

Pour les installations supérieures à 2000 utilisateurs, les iops attendus peuvent être calculés selon le nombre d'utilisateurs et l'usage :

Unités	IOPS par unité
1	1

IOPS data for storage devices (wikipedia)

Device	Type	IOPS	Interface	Notes
7,200 rpm SATA drives	HDD	~75-100 IOPS [2]	SATA 3 Gb/s	
10,000 rpm SATA drives	HDD	~125-150 IOPS [2]	SATA 3 Gbit/s	
10,000 rpm SAS drives	HDD	~140 IOPS [2]	SAS	
15,000 rpm SAS drives	HDD	~175-210 IOPS [2]	SAS	

Source: http://en.wikipedia.org/wiki/IOPS

Examples

Core/RAM distribution over several servers (virtual or otherwise) is not described here.

However, for up to 16/24 cores, we believe that a single-platform installation makes sense.

Above this threshold, and to manage populations of tens of thousands of users or more, the architecture must be distributed.

Also, the messaging part as well as the database (which collaborative use/smartphone places heavy demands on) must be kept separate from the rest.

Users / Units	Node	CPU #cores	RAM	IOPS / Disk
25 users / 5 with smartphones 45 units (20 + 25)		2	16	13.5 / all disks
150 users / 50 collaborative users of which 25 with smartphones 225 units (100+25*2+25*5)		4	16	67.5 SATA 7,200 minimum
300 users / 100 collaborative users / 30 smartphones 490 units (200 + 70*2 + 30*5)		4	24	147 2 * 10K rpm SAS 1 * 15K rpm SAS
600 users / 200 collaborative users / 50 smartphones 950 units (400 + 150*2 * 50*5) 4 CPU, 24 GB of RAM	Core	2	20	285 SSD, Bay or other system
	Edge	2	4	
1,000 users / 250 collaborative users / 100 Psmartphones 1,300 units (750 + 150 * 2 + 100 * 5) 6 CPU, 32 GB of RAM	Core	2	20	390 SSD, Bay or other system
	BM-ES	2	8	dedicated ES for more than 1TB of emails and archives
	Edge	2	4	
2,000 users / 500 collaborative users / 200 smartphones 3,100 units (1500 + 300*2 + 200 * 5) 12 CPU, 48GB of RAM	Core	6	20	930 Bay (2,000 IOPS)
	BM-ES	2	12	dedicated ES from 1TB of emails and archives
	Cyrus	2	12	dedicated Cyrus from 2TB of emails and archives
	Edge	2	4	
4,000 users / 1000 collaborative users / 300 smartphones 5,900 units (3000 + 700*2 + 300*5) 12 CPU, 64GB of RAM	Core	6	36	1,770 Bay (2-3,000 IOPS)
	BM-ES	2	12	dedicated ES from 1TB of emails and archives
	Cyrus	2	12	dedicated Cyrus from 2TB of emails and archives
	Edge	2	4	

4,000 users / 1000 collaborative users / 1000 smartphones 8,000 units (3000 + 1000*5) 16 CPU, 64GB of RAM	Core	6	36	2,400 Bay 3,000 IOPS SAN / other technology
	BM-ES	4	12	dedicated ES from 1TB of emails and archives
	Cyrus	4	12	dedicated Cyrus from 2TB of emails and archives
	Edge	2	4	
4,000 users / 4,000 collaborative users / 1000 smartphones 1,1000 units (3,000*2 + 1,000*5) 22 CPU, 96GB of RAM	Core	10	44	3,300 SAN / other technology
	BM-ES	4	24	dedicated ES from 1TB of emails and archives
	Cyrus	4	24	dedicated Cyrus from 2TB of emails and archives consider 2 cyrus nodes
	Edge	2	4	
5,000+ users (10,000; 100,000; etc.) The system must be distributed and the architecture designed on an ad-hoc basis.				

Bandwidth

Bandwidth requirements cannot be predicted as they largely depend on mail traffic.Please note that the data on bandwidth usage of the BlueMind calendar and smartphones below clearly shows the preponderance of mail traffic.

BlueMind Calendar bandwidth

For a user with the Calendar application open in their web browser, in http and in bytes (measured on the network with Wireshark):

- every 30 seconds: one doSync 1067 / 293 (sends local modifications and retrieves changes)
- every 5 seconds: one ping: 898 / 233, i.e. 5388 / 1398 in 30s (one keepalive)

Client to server: 215 bytes/sec (1,067+5,388)/30

Server to client: 56 bytes/sec (293+1,398)/30

Number of active users	Client to Server	Server to Client
1	215 B/s	56 B/s
100	21 KB/s	6 KB/s
1,000	210 KB/s	60 KB/s
10,000	2.1 MB/s	600 KB/s

With room for maneuver, for 1,000 Calendars running in web browsers:

- Client to server: 500KB/s
- Server to client: 150KB/s

Contacts bandwidth

For a user with the Contacts application running in their browser, in http and in bytes:

144 bytes/second

Specifically:

- a ping every 5 seconds
- a "bmc" every 30 seconds

By doubling the value measured to ensure a comfortable safety margin, we calculate a bandwidth of 288 bytes per second for a user who has launched the Contacts application.

Smartphone bandwidth

Microsoft provides the following ActiveSync ratios: 1.04KB/s/user

i.e. for 100 smartphones: 104Kbit, or 13KB/s

By taking a sensible safety margin of x2, we calculate:

- 100 smartphones == 26KB/s
- 1,000 smartphones == 260KB/s