

Electronic scientific communication : from email to multimedia

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1 Introduction

At the beginning of the '90 it became true that many of the people active in some scientific fields were reachable by e-mail. It was back in 1991 that I named *babbage.sissa.it* an HP workstation after Charles Babbage (1791-1871) of Difference and Analytical Engine fame. That was the first time the name of Babbage appeared in Sissa.

1.1 E-Print system

Original servers in 1992 :

- xxx.lanl.gov
- babbage.sissa.it

Now about 15 sites :

- .arXiv.org
- Australia, Brazil, China, France, Germany, India
- Israel, Italy, Japan, Russia, South Korea
- Spain, Taiwan, U.K., U.S.

1.2 History

- Started August 1991 : hep- lists at LANL
- Started March 1992 : cond-mat, astro-ph ,funct-an in Trieste
- 1993 : Gopher server
- 1994 : Web interface
- 1996 : Auto T_EX at LANL

2 Some facts and numbers

2.1 Lists available

- high energy physics-theory (hep-th)
- high energy physics-phenomenology(hep-ph)
- condensed matter (cond-mat)
- astrophysics (astro-ph)
- functional analysis (funct-an)
- general relativity and quantum cosmology (gr-qc)
- nuclear theory (nucl-th)

2.2 Articles received

	August 1992	February 1993	February 1994	September 1996
hep-th	81	144	156	240
hep-ph	62	121	164	331
gr-qc	11	37	45	73
nucl-th	-	16	33	66
cond-mat	27	39	114	292
astro-ph	7	18	71	204
funct-an	-	8	1	4
Total	188	383	584	1210

Table 1: Number of articles received per month

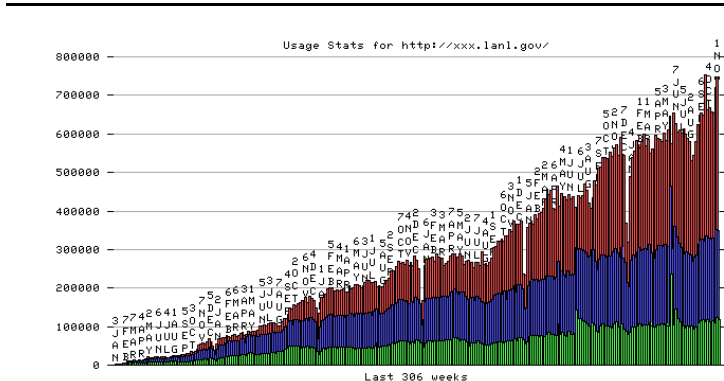
Now (end of 1999) the total number of submissions is over **2500** each month.

2.3 Subscriptions

	SISSA March 1994	LANL November 1993
astro-ph	1981	-
cond-mat	2281	-
funct-an	422	-
hep-ph	383	1450
hep-th	646	2070
nucl-th	138	703
gr-qc	353	1036
Total	6204	5259

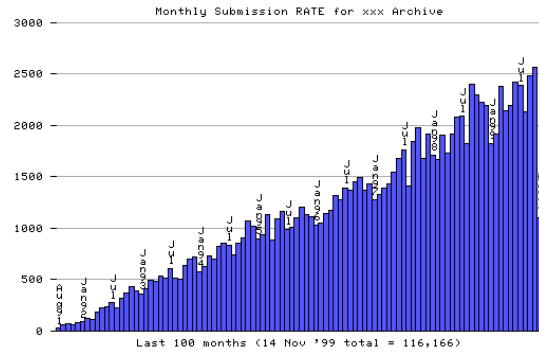
Table 2: Subscriptions

HTTP server weekly usage



2.4 HTTP requests per week/Papers submitted each month

monthly submission rate statistics



3 Technical details

3.1 Email systems

It was essential that at the beginning of the diffusion and spreading of the system we had a very

- RSCS based : Bitnet
- uucp based : UUnet
- Decnet based : HEPnet/ESnet
- TCP/IP based : Internet

3.2 Access methods

- E-Mail
- Anonymous ftp
- Gopher
- WWW

3.3 Sync of mirrors

- prospero dfs

- rdist
- sup
- rsync
- mirror
- fmirror
- wget

3.4 Scripting languages

- shells : csh, sh
- perl
- tcl
- python

3.5 Http servers

- ncsa
- cern
- apache
- aol server

3.6 Text searches

- grep, egrep
- agrep
- wais
- dbm, db

4 MBone

MBone is the network of interconnected sites able to support ip multicasting.
End of 1995 started some mbone experiments

- standard vic : audio/video
- 100 Kb/s
- whiteboard: wc
-

5 Microsoft NetShow

6 Small Troubles

- TTL problems
- Invalid email addresses
- Sendmail fanout
- ICMP bombs
- SYN floods