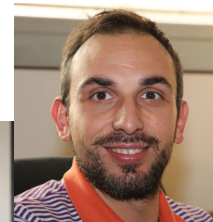


State of Storage

CdG 17 Giugno, 2022

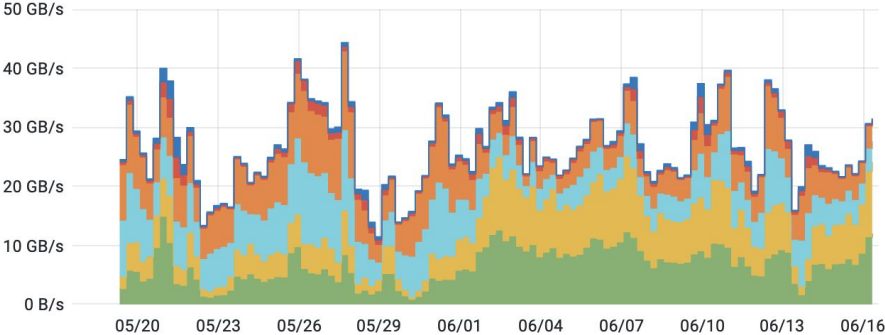


Business as usual

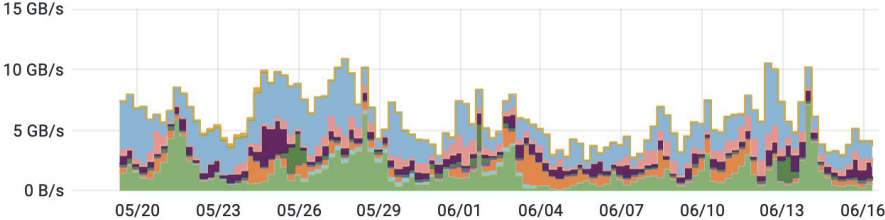


Last month

All servers network traffic out (reading)

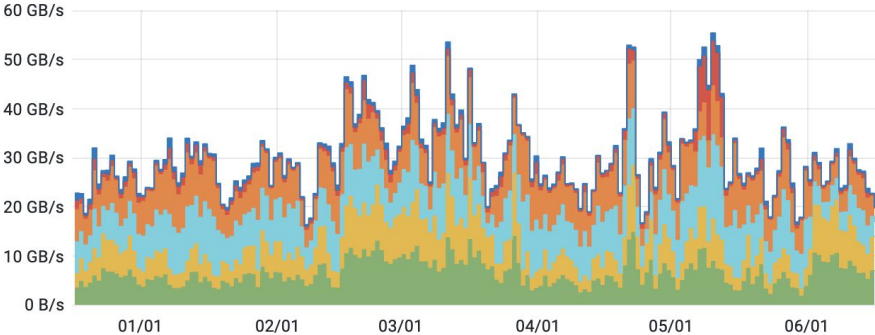


Gateway traffic out (non POSIX reading) ▾

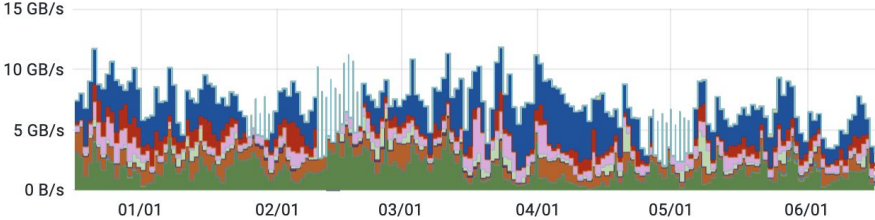


Last 6 months

All servers network traffic out (reading)



Gateway traffic out (non POSIX reading)



Disk storage in produzione

Installed: **50.07 PB**, Pledge 2022: **59.1 PB**, Used: **41.4 PB**

Sistema	Modello	Capacita' netta, TB	Esperimenti	Scadenza
ddn-10, ddn-11	DDN SFA12k	10752	ALICE, AMS	03/2021→ 06/2023
os6k8	Huawei OS6800v3	3400	GR2, Virgo	06/2022
md-1,md-2,md-3,md-4	Dell MD3860f	2308	DS, Virgo, Archive	11/2021 → 12/2022
md-5, md-6, md-7	Dell MD3820f	28	metadati, home, SW	12/2022
os18k1, os18k2	Huawei OS18000v5	7800	LHCb	2023
os18k3, os18k5, os18k5	Huawei OS18000v5	11700	CMS	2024
ddn-12, ddn-13	DDN SFA 7990	5060+870	GR2,GR3	2025
ddn-14, ddn-15	DDN SFA 2000NV	24	metadati	2025
os5k8-1,os5k8-2	Huawei OS5800v5	8999	ATLAS	2027
Cluster CEPH	12xSupermicro SS6029	3400	ALICE, cloud, etc	2027

Prossimi acquisti

- Gara storage 2022 (14PB netti)
 - Gara pubblicata il 13/06/2022
 - Installazione e messa in PROD verso fine dell'anno
- Acquisto di emergenza (solo dischi da inserire in sistemi già esistenti)
 - DDN - 76 slot liberi x14TB = 1064TB raw (870TB netti) → gpfs_data
 - Installato
- Ulteriore acquisto di tape (14PB per arrivare a pledge 2022) a breve

Current SW in PROD

- GPFS 5.0.5-9 (to be updated soon to 5.1.2-4)
- StoRM BackEnd 1.11.21 (latest)
- StoRM FrontEnd 1.8.15 (latest)
- StoRM WebDAV 1.4.1 (latest)
- StoRM globus gridftp 1.2.4
- XrootD 4.11.2
 - updated to 4.12.4 in the 4 CMS servers
 - 5.3.1-1 on CMS redirectors (local and EU/IT/FR)

Recent activity

- ATLAS, CMS, LHCB
 - Authz policies in StoRM WebDAV aligned with those implemented in StoRM backend
- 8/6: Down of gpfs_data and gpfs_virgo for DDN upgrade - **DONE**
- CMS
 - New features in xrootd monitoring with ELK stack: we can now plot paths where reading happens and site where connections come from
- ALICE
 - Need to upgrade kernel (reboot) for ds-801, ALICE XrootD redirector (currently a single point of failure)
 - Switch to redirector in each server mode (**on hold**)
 - Already in production in the xrootd-ceph cluster

Stato tape

16 Apr 2022 - 15 Jun 2022

MSS bytes in/out (per day)



— out traffic (recalls)
— in traffic (migrations)

min	max	avg	current	total
55.7 GB	117 TB	28.9 TB	222 GB	1.76 PB
1.17 TB	130 TB	48.9 TB	29.3 TB	2.98 PB

Stato tape

- Liberi 12.9 PB (su cassette vuote, complessivamente sulle 2 librerie).
Usati 96.9 PB.
 - Pledge 2022: 130.5 PB
 - Installato attuale: 116.5 PB
 - Spazio teoricamente ricavabile da reclamation: 4.7 PB
 - di cui 800 TB liberabile in qualche settimana
 - ~3.5 PB difficilmente recuperabili (inefficienza fisiologica del 3%)
 - Spazio libero su cassette semipiene: 1.9 PB

Library	Tape drives	Max data rate/drive, MB/s	Max slots	Max tape capacity, TB	Installed cartridges	Used capacity, PB
SL8500 (Oracle)	16*T10KD	250	10000	8.4	~10000	75.1
TS4500 (IBM)	19*TS1160	400	6198	20	1750	21.8

Prossimo acquisto tape

- Cancellazioni
 - ATLAS ha rimosso 2 PB a maggio
 - CMS ha rimosso 560 TB da poco
 - Appena iniziata maxi campagna di cancellazione di circa 9 PB
 - Space reclamation a campagna terminata per liberare spazio effettivo
 - LHCb cancellerà a breve 100 TB
- Scritture LHC intense non prima di agosto/settembre
- Attendiamo il prossimo futuro per avere info più precise su quantità di spazio realmente necessario per arrivare a pledge 2022