

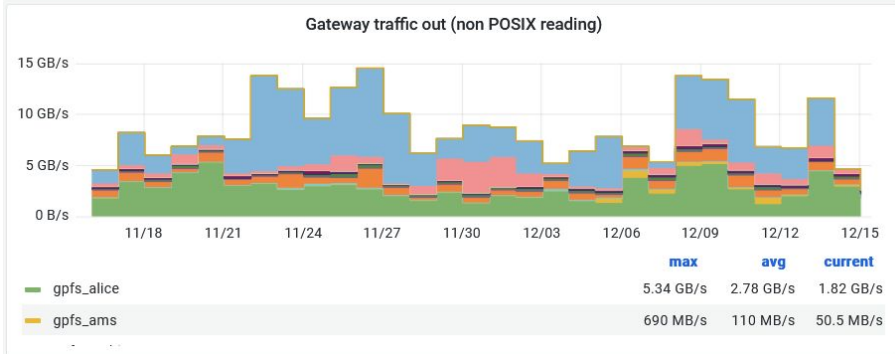
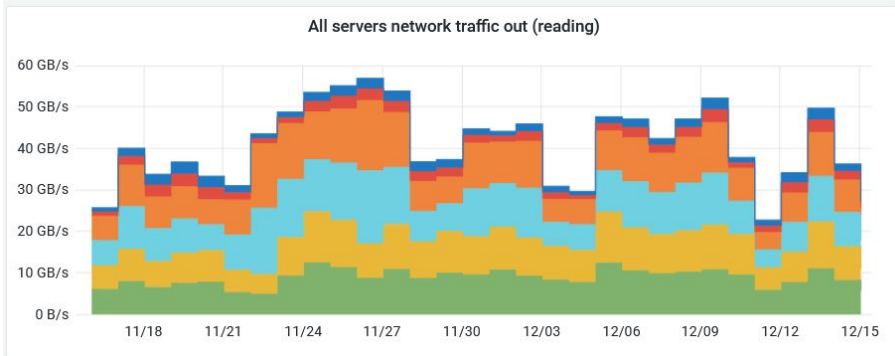
State of Storage

CdG 16 dicembre, 2022

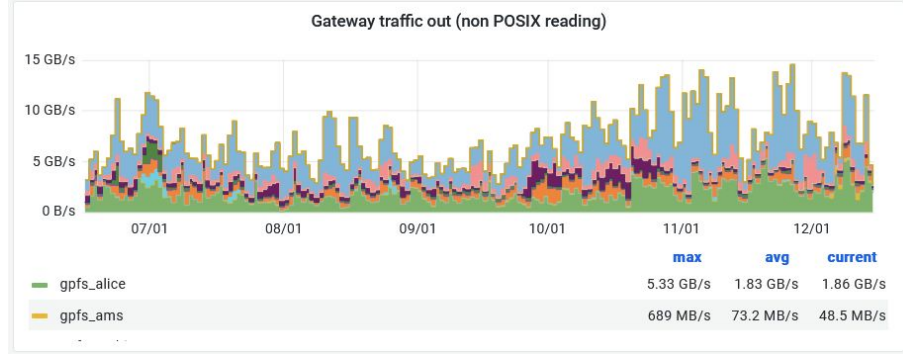
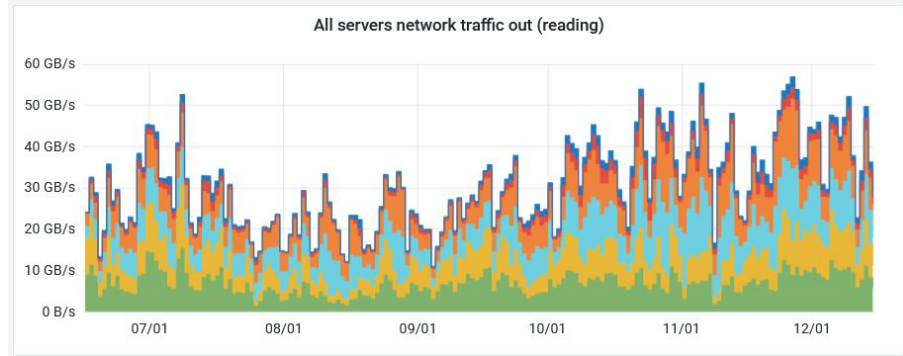


Business as usual

Last month



Last 6 months



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	12/2022
os6k8	Huawei OS6800v3	3400	GR2, Virgo	12/2023
md-1,md-2,md-3,md-4	Dell MD3860f	2308	DS, Virgo, Archive	11/2023
md-5, md-6 e md-7	Dell MD3820f	50	metadati, home, SW	11/2023 e 12/2024
os18k1, os18k2	Huawei OS18000v5	7800	LHCb	2023
os18k3, os18k5, os18k5	Huawei OS18000v5	11700	CMS	2024
ddn-12, ddn-13	DDN SFA 7990	5840	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

Acquisti recenti e futuri

- Disco ulteriore per sistemi Huawei
 - 600TB netti
 - Appena arrivati, in produzione a brevissimo
- Gara storage 2022 (14PB netti)
 - Il vincitore (provvisorio) e' Lenovo con ThinkSystem DE6600
(Derivato dal NetApp DE6600 con un enclosure con i dischi NVME)
 - Installazione e messa in PROD in Q1 2023
- AQ storage 2023-2024
 - Approvato a Novembre
 - 64PB nel 2023 + 14PB nel 2024



Current SW in PROD

- GPFS 5.0.5-13 (to be updated soon to 5.1.2-8)
 - Updated to 5.1.2-8 for CMS
- 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 5.4.2-1 for CMS
 - 5.3.1-1 on CMS redirectors (local and EU/IT/FR)
- Ceph 16.2.6 (Pacific)

Tickets and problems - last month

- Ready to configure access with tokens for all the storage areas upon request
- Ready to switch off gridftp upon request
- ATLAS
 - Transfer failures due to changes in access permissions(GGUS [159622](#))
 - Open on Friday 10pm, fixed on Saturday morning
 - Bug with StoRM WebDAV: unexpected unauthorized response on nested storage areas ([STOR-1567](#))
 - Removed all nested storage areas in a transparent way on December 6th
 - TPCs in push-mode to GOOGLE_EU fail for all StoRM sites (GGUS [158487](#))
 - Issue for StoRM developers, on hold
- CMS
 - [Issue](#) opened to developers: thread saturation, log files stuck, need restart
 - Upgraded XrootD version to 5.4.2.-1
 - Currently trying to verify the impact of xrootd.async off nosf
- LHCb
 - [Issue](#) with DNS resolving mechanism fixed in FTS for all Gfal2 protocols; this had quite some impact on the Spring Tape data challenge

Tickets and problems - last month

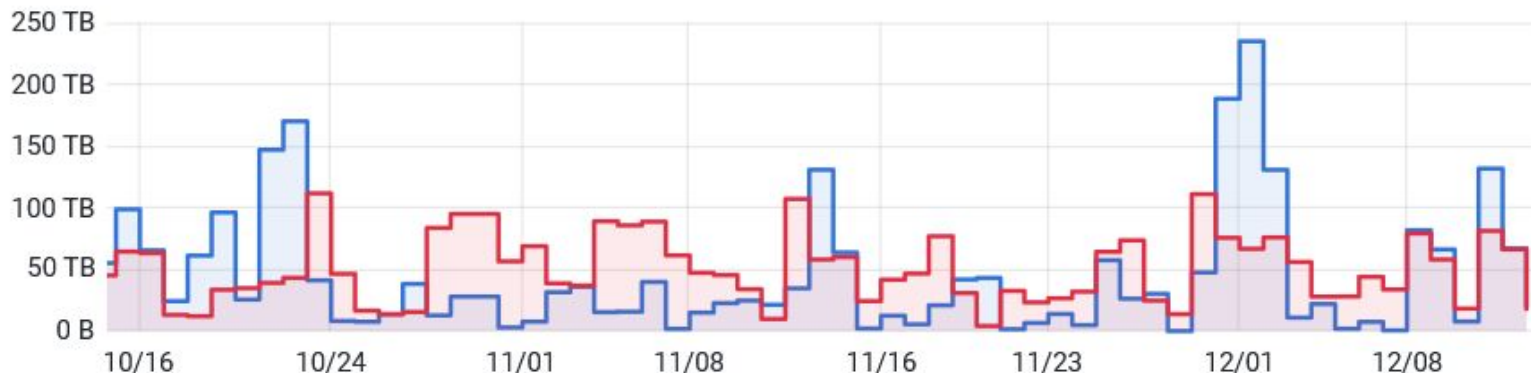
- Borexino
 - Data exposed via StoRM WebDAV to be downloaded by approved colleagues from JINR with dedicated group in iam-t1-computing
- Km3Net
 - Access via StoRM WebDAV to data in /storage/gpfs_data/km3/raw/sea with dedicated group in iam-t1-computing
 - Discussing transition to StoRM WebDAV, away from gridftp-plain-virgo, for other folders as well

- Together with User Support, enforcing a transition away from gridftp for all no-LHC experiments (Newchim, Euclid, Dampe, Darkside, Km3, Limadou, Miblat)

Stato tape

14 Oct 2022 - 13 Dec 2022

MSS bytes in/out (per day)



— out traffic (recalls)

— in traffic (migrations)

min	max	avg	current	total
16.5 GB	235 TB	44.0 TB	18.5 TB	2.64 PB
4.11 TB	112 TB	49.5 TB	16.4 TB	2.97 PB

Stato tape

- Liberi 27 PB (su cassette vuote, complessivamente sulle 2 librerie).
Usati 94 PB.
 - Pledge 2022: 130.5 PB
 - Installato attuale: 130.5 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	60
TS4500 (IBM)	19*TS1160	400	6198	20	2450	34

Scenari tape a medio termine

- Acquisto nuova libreria nel 2023
 - 2 possibili soluzioni
 - Libreria IBM TS4500 (come quella attualmente al CNAF) con supporto a drive IBM e LTO
 - Libreria SpectraLogic Tfinity con supporto a drive IBM, LTO e Oracle
- Repack da Oracle a IBM senza spostamento della libreria Oracle al Tecnopolo
 - Entro il 2024
 - 2 scenari principali
 - Repack da Oracle a libreria IBM attuale in sede Berti Pichat e possibile spostamento dati su nuova libreria al Tecnopolo, un file system alla volta
 - Repack da Oracle a IBM nella nuova libreria al Tecnopolo (possibile solo su SpectraLogic)