



GridPP
UK Computing for Particle Physics



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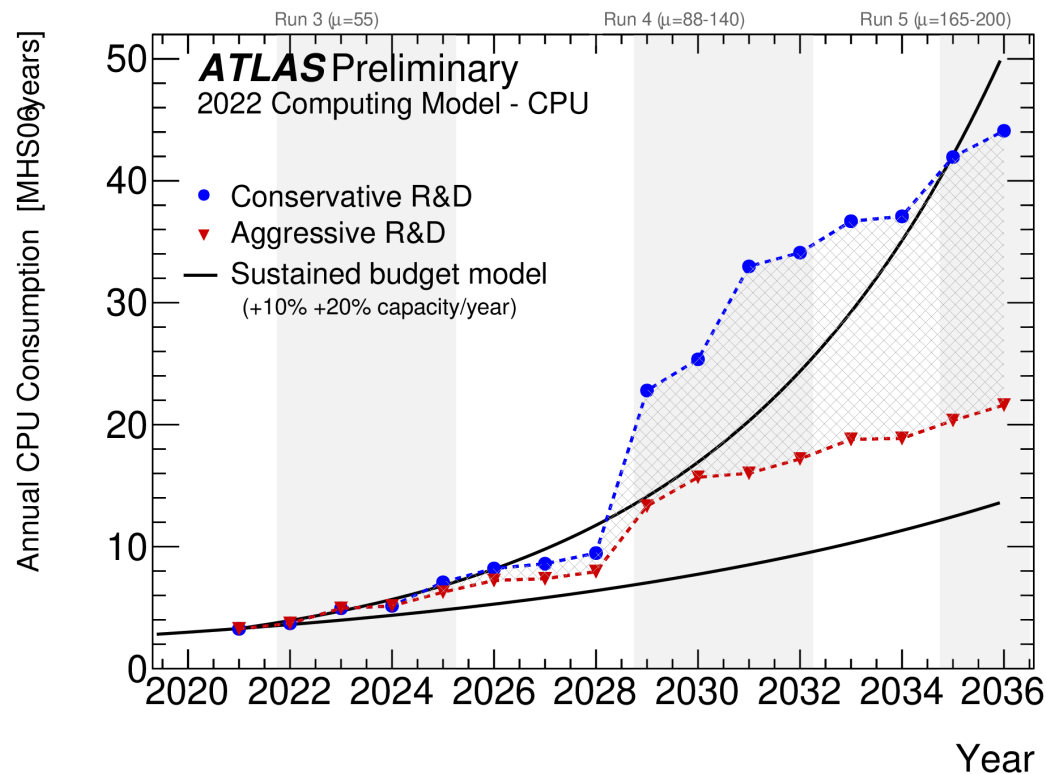
WLCG Flat Budget Model

WLCG Overview Board
8th Dec 2022

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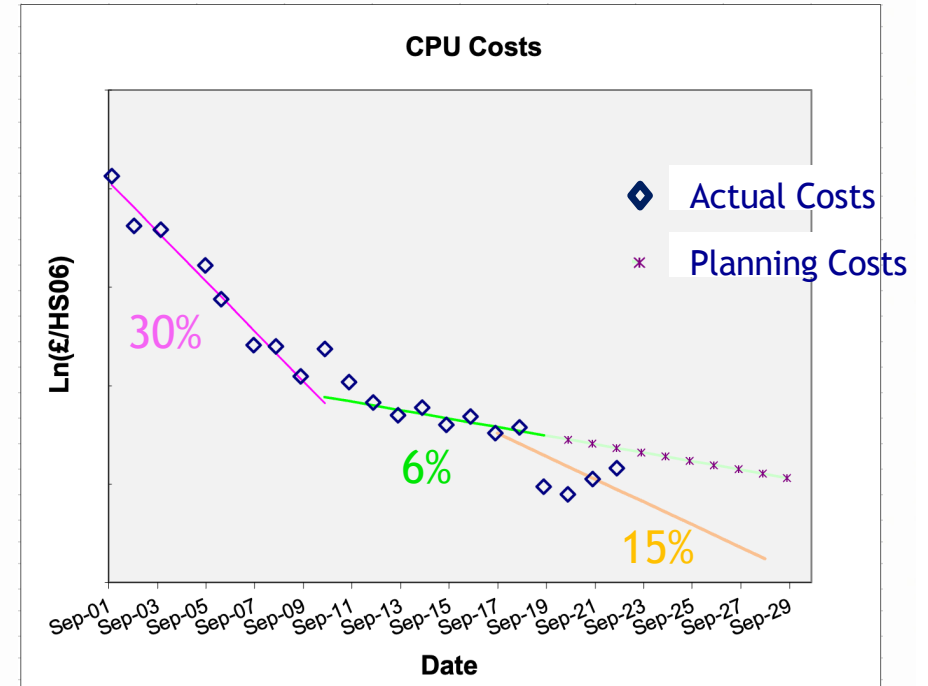
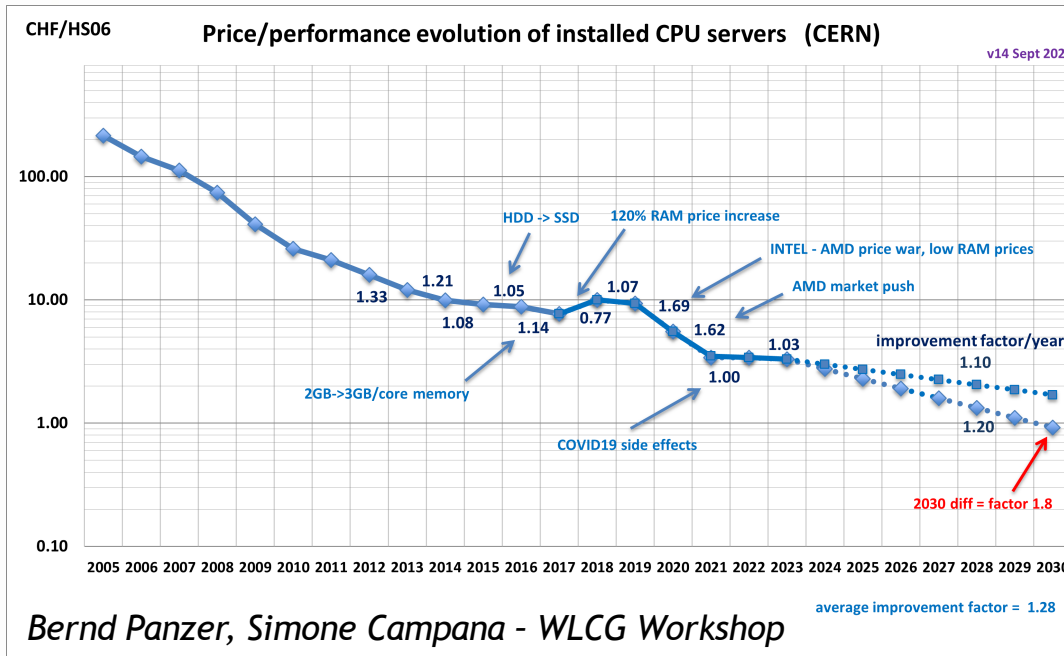
Problem Statement



- What does “Flat Budget” really mean?
- Does it imply 5% 10% 15% or 20% more resources each year?
- How much does this vary cross WLCG?
- How to translate one resource to another, and maintain the flat-budget constraint?
- What is included and excluded in the calculation?



Historical Trends: CPU



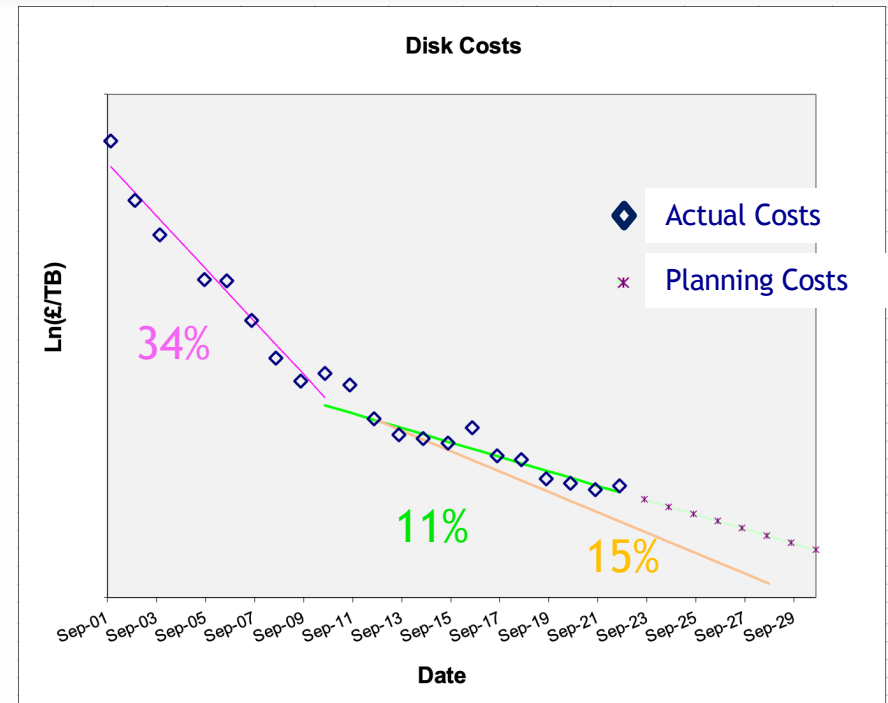
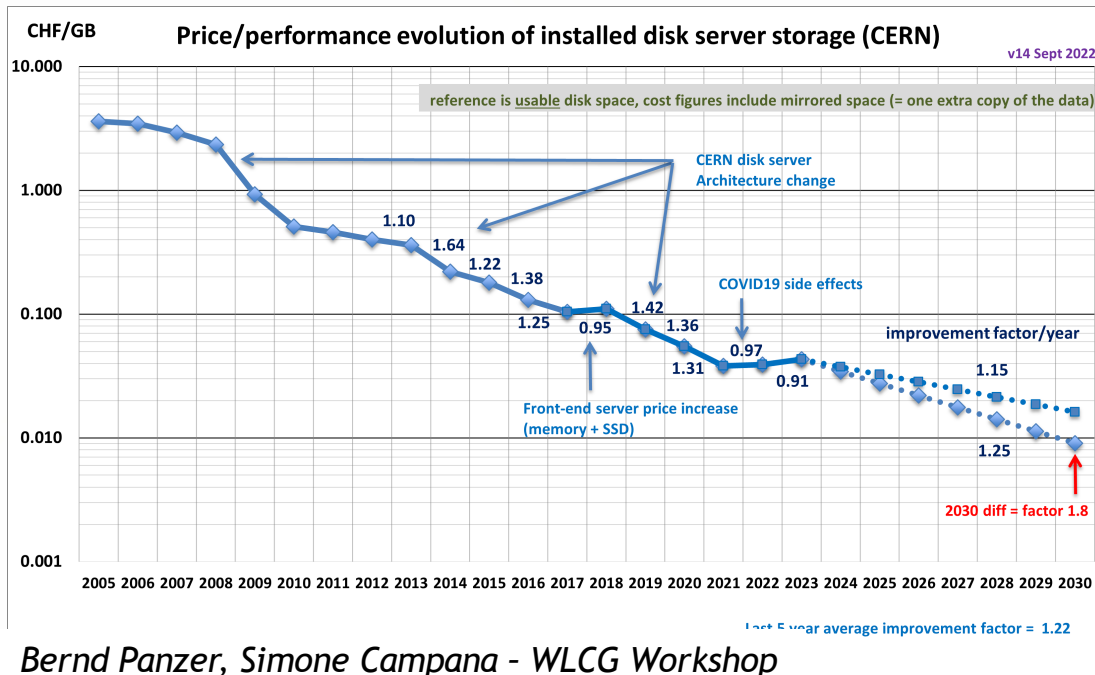
CERN regularly provides these plots with the price per HS06 (CPU)

UK has monitored (Tier-1) prices for last 20+ years.

Extrapolation rapidly diverges!



Historical Trends: Disk



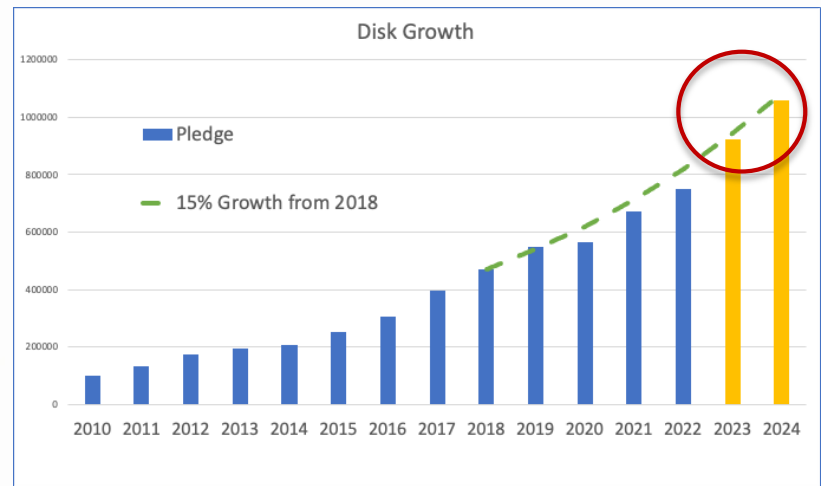
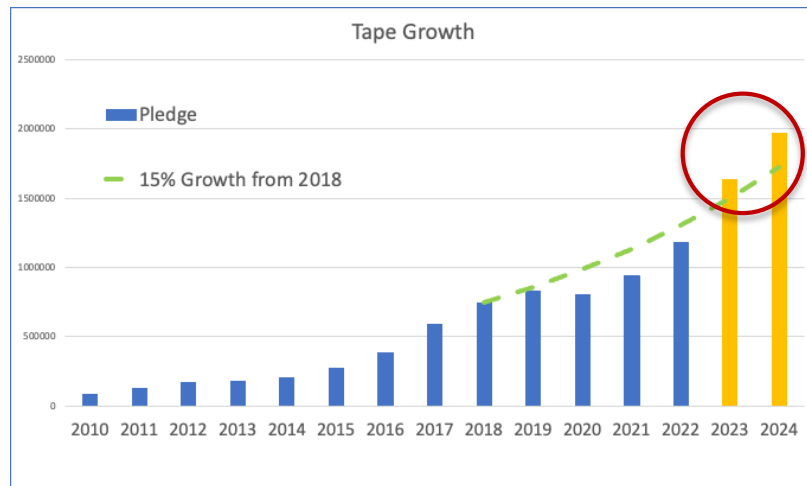
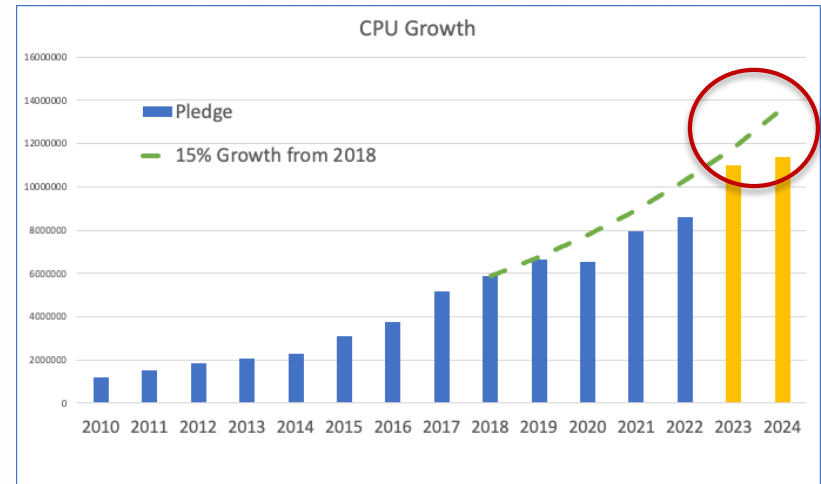
CERN regularly provides these plots with the price per GB (Disk)

UK has monitored (Tier-1) prices for last 20+ years.

Extrapolation rapidly diverges!

Can we convert HS06, TB (disk) and TB (tape) into one “currency” ?

Would need common metric for experiments and C-RSG.





- Recently formed WLCG Flat Budget study group - met once and had a preliminary discussion of scope of work.
- Two threads:
 - What data can be collected, and how?
 - Can we define some sort of WLCG Coin (common currency)?
- Data would need to be simple and not expose real costs. E.g. year-on-year price change.
- Model could (should) be simple at the top level but might have various levels of finer granularity. Eg. Overall WLCG average (weighted by site size?); Country-specific information; Experiment-specific averages?
- Requirements and pledges would still be for individual resource types but CRSG and experiments could understand how to trade-off one resource for another, whilst respecting the “Flat Cash” constraint.



Simple Example (UK)

- Use ratio of (actual or extrapolated) Disk and CPU costs
- E.g. 1TB of disk estimated to cost same as 6 HS06 CPU in 2023 (UK)
- Assume (UK) Tape is 3x cheaper than disk storage.

1 TB disk = 6 HS06 CPU = 3 TB of tape.

This “exchange rate” will change with each year of extrapolation.

Comments:

- Tape storage costs are very “lumpy” and may be site dependent.
 - Ask each Tier-1 for their estimate and if variance is reasonable, take average?
- What about cost of power? Big for CPU, small for Tape.
 - Yes, makes sense; it’s about 40% (UK) of TCO?
- What about effort? Disk takes more effort than CPU.
 - No, getting too detailed?

It doesn't have to be perfect!



Work in progress to...

... understand better what “flat cash” means across WLCG and see whether we can agree a common planning assumption.

... see whether we can define a common currency to allow Experiments and C-RSG to via resources from one type to another within an agreed flat-cash envelope.