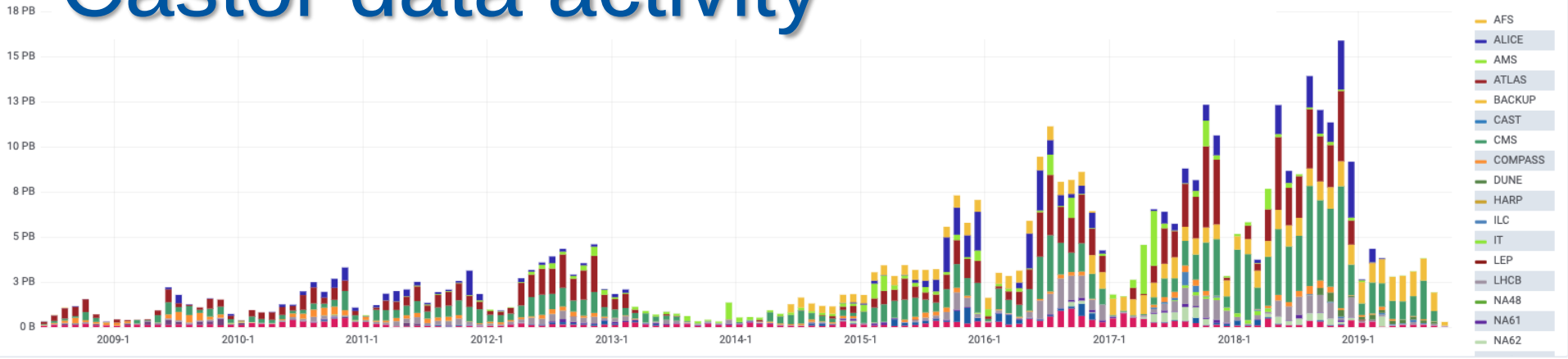
WLCG Update

Ian Bird

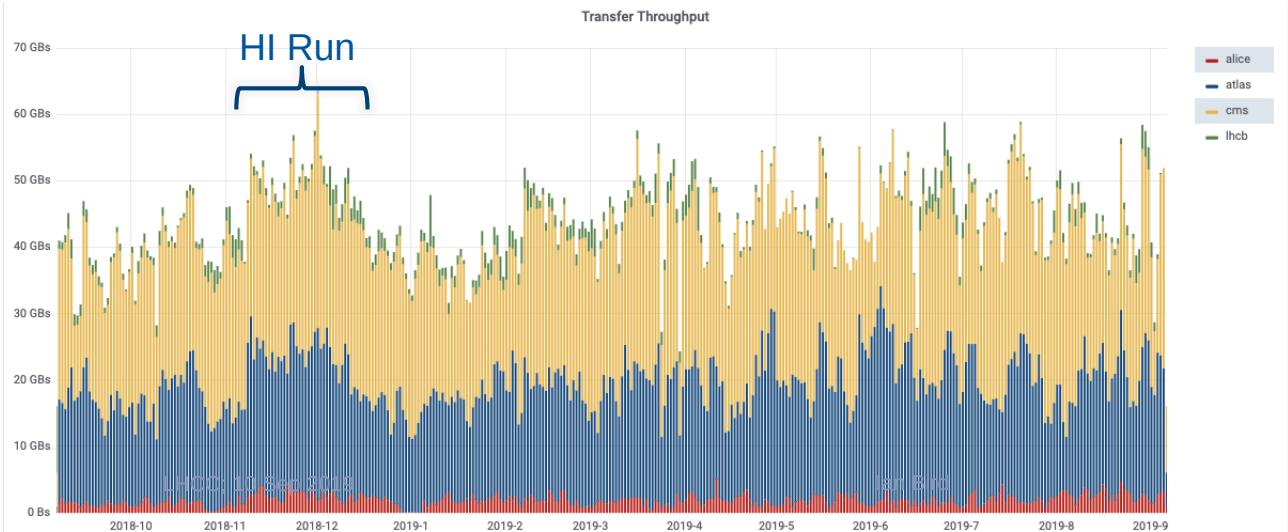
LHCC Referee's meeting

CERN, 10th September 2019

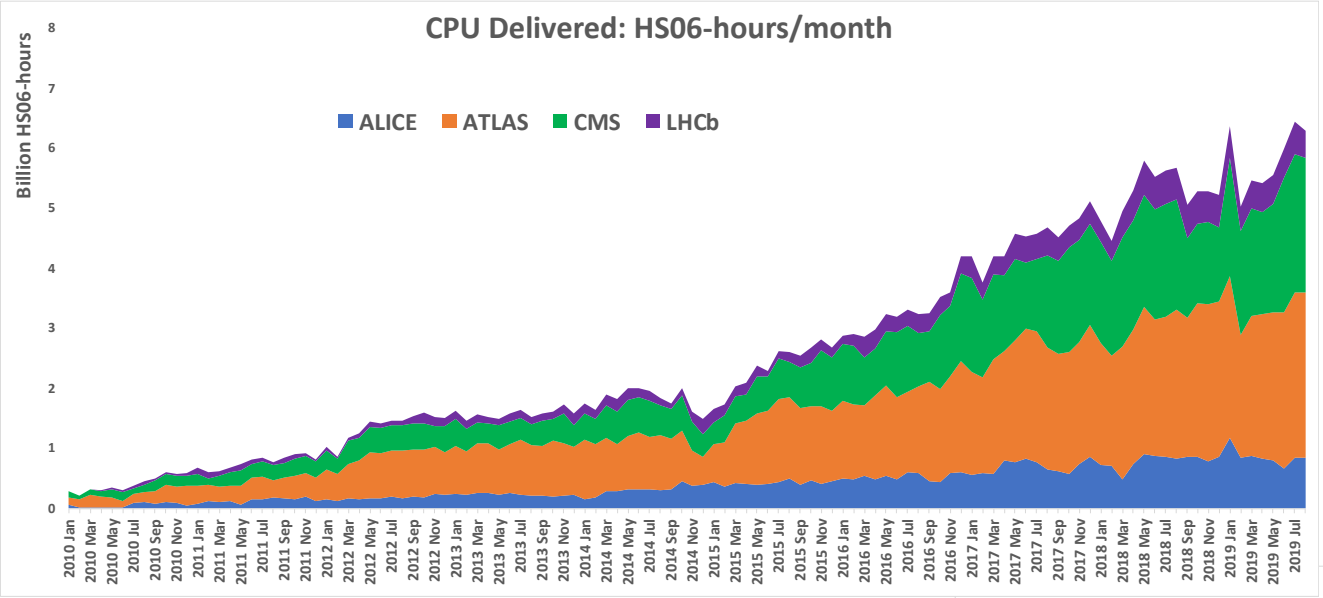
Castor data activity



Data transfers



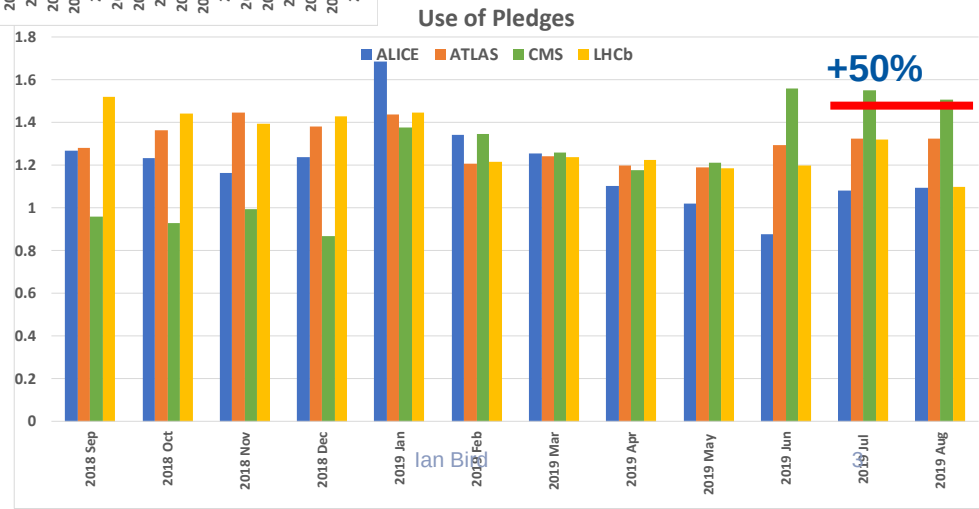
CPU Delivered



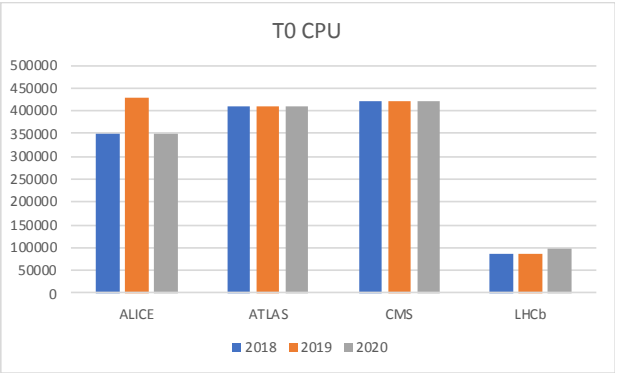
Peaks: ~271 M HS06-days/month

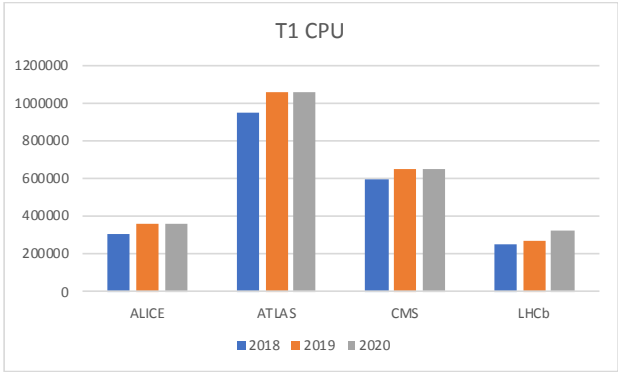
~ 875 k cores continuous

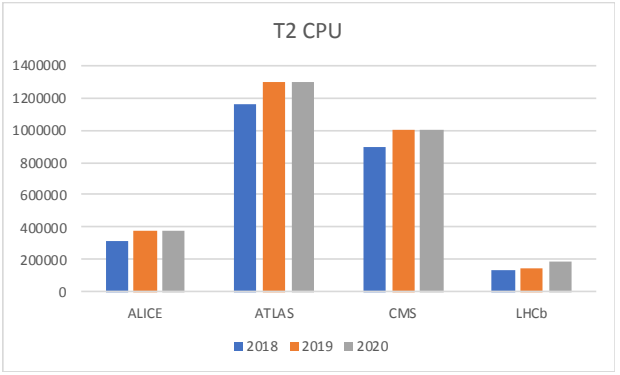
(From sites that pledge)

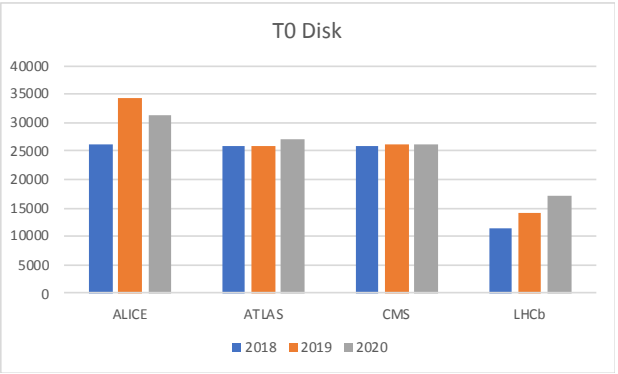


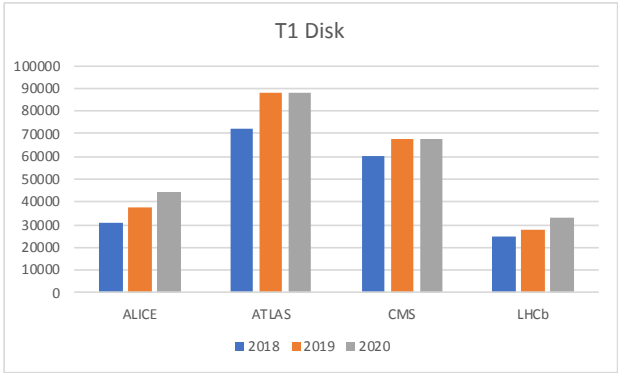
Requirement (pledge) evolution

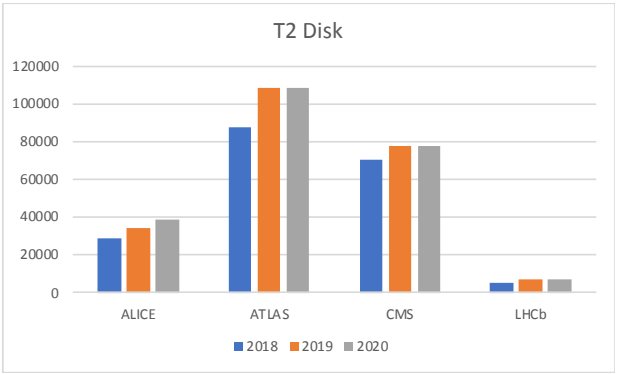












2020 Pledges not yet updated (end Sept), but should be OK

Run 3 guidance – June 2019

For 2021 the baseline assumption for the proton run is as presented in the March 6 LMC:

- bunch intensities ramping linearly up from 0 to 1.4e11ppb over the year with limited availability of the injectors/LHC resulting in **only 20% machine efficiency**.
- Note that LHCb is expected to be leveled at 1x10^33 for most of the time as the bunch intensity will not be sufficient to reach 2x10^33 for the duration of a full fill.
- For contingency planning, the machine efficiency can be assumed to reach the normal value of 50%. This results in the following luminosity envelope:

	Baseline	Upper limit
ATLAS/CMS	17/fb	42/fb
LHCb	3/fb	7/fb
ALICE	36/pb	90/pb

- We would like to emphasize that the upper limit is for **contingency planning only (i.e. raw data tape storage), not physics planning**.
- Furthermore the baseline numbers are likely to shift and should not be considered as luminosity targets yet. Updated numbers are likely to come towards the end of the year.
- For the PbPb period, it is assumed to be a full production year for now, which means more >2/nb for ATLAS, ALICE and CMS.

Run 3 : best guess

- Given information from LHC team, following June LHCC request:
  - Agree baseline for 2021 is 17 fb^{-1}
    - With contingency plan (for tape) is up to 42 fb^{-1}
  - No additional (needed!) input on likely conditions was given
    - So agreement is to assume levelling is for 4 hours per fill
  - Assume a full HI run
- Likely situation as far as we understand:
  - 2021 is a very low data test run, resources same as 2018 for pp;
    - However, full HI run is likely – will need some level additional resources
  - 2022 is a full year with a resource level of 1.5 x 2018
  - Moderate (20%) growth rates for 2023 (and 2024)

Use of HPC resources

- Likely that we will be offered HPC resources:
  - Opportunistically (as now); many countries
  - As part of pledges (e.g. in US)
- There are many technical and organizational issues associated with this
  - Can (and do) use HPC as CPU resource, in “backfill” mode; usually as a one-off with each facility
  - Does not make good use of GPU’s, low latency network, etc. and our codes are not efficient on these architectures
    - Need significant software engineering effort
- Several activities ongoing:
  - Workshop held in May to agree common set of concerns, technical, organizational, policy
    - https://indico.cern.ch/event/811997/
    - There will be a document describing these challenges, for discussion with HPC facilities
  - Working group active to propose how we can make an equivalency for pledging and accounting purposes
    - This is not trivial
- NB. The SW engineering work ongoing to effectively use GPU, and other architectural features of CPU is relevant here, but not sufficient
- Should bear in mind these machines are not really cost-effective for HEP, but we are being required to use them in some circumstances
- Strategy –
  - Welcome them for opportunistic additional resources;
  - Will not encourage the replacement of HTC clusters with HPC

DOMA - updates

- See Simone Campana →

Summary

- Very calm few months – but services fully used and busy
- Run 3 scale still somewhat open
  - Reasonable planning numbers agreed
- HL-LHC
  - Will update requirements for nominal HL-LHC at end of 2019
  - DOMA and other R&D work active
  - Preparation for Spring review is needed – would like to understand scope, and likely timescale fairly soon