Requirements for 2018

Follow up after RRB/LHCC

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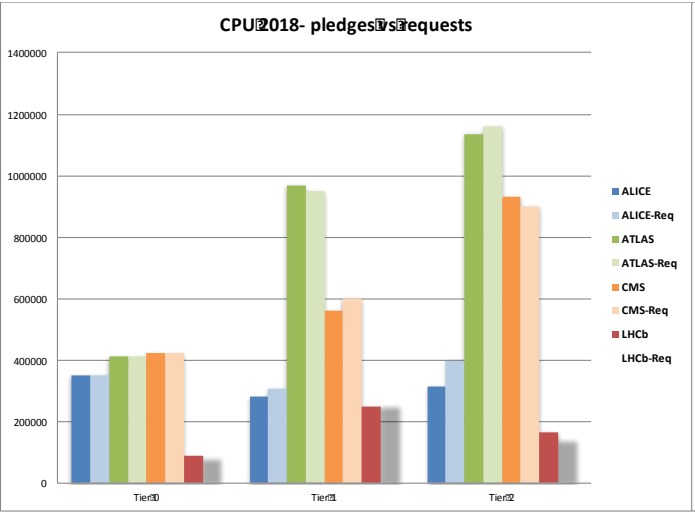
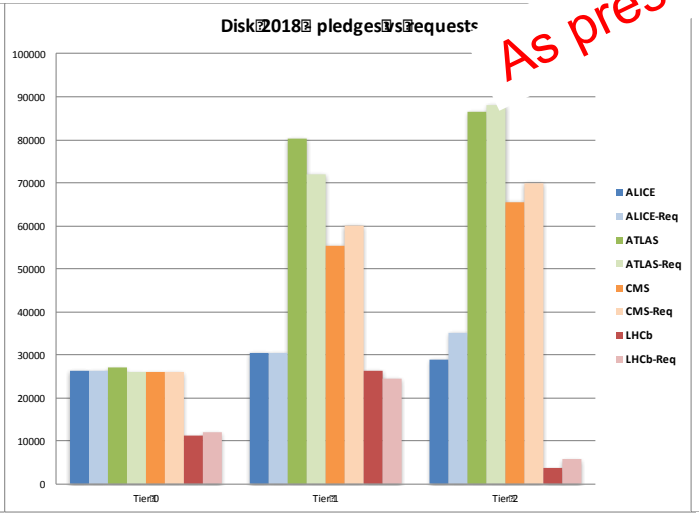
MB

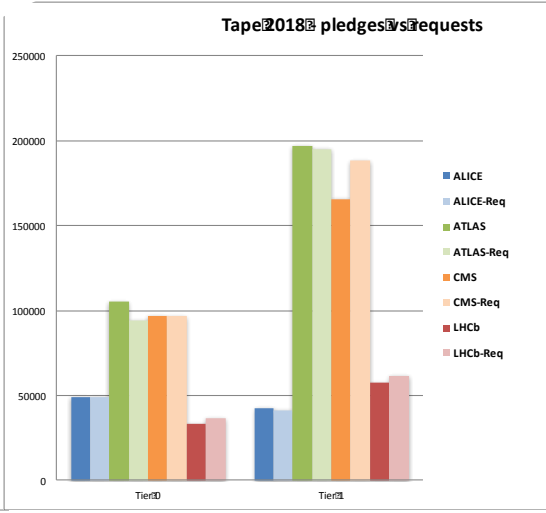
CERN, 19 Dec 2017

2018 Pledge situation

As presented to RRB







2018 pledges wrt requests:

As given in REBUS, inc. update from ALICE (10/10/17)

Missing pledges (11/10/17):

Estonia, Germany (ATLAS/Munich)*, Greece (Kavala), Latin America (some), Malaysia, Mexico*, Pakistan, South Africa*, Spain (ATLAS)*, Thailand

*Included here, but too late for written report

Pledged Resources for 2018

The experiments has made a large effort to keep the resource needs within *flat budget.*

$$Pledges\ balance = \frac{total\ offered - experiment\ required}{experiment\ required}$$

2018	ALICE	ATLAS	CMS	LHCb
CERN CPU	0%	0%	0%	0%
CERN disk	0%	0%	0%	0%
CERN tape	0%	0%	0%	0%
Tier-1 CPU	-9%	2%	-6%	-1%
Tier-1 disk	0%	11%	-8%	7%
Tier-1 tape	3%	1%	-12%	12%
Tier-2 CPU	-21%	-2%	3%	16%
Tier-2 disk	-18%	-2%	-6%	-36%

2017	ALICE	ATLAS	CMS	LHCb
CERN CPU	0%	0%	0%	0%
CERN disk	0%	0%	0%	0%
CERN tape	0%	0%	0%	0%
T1 CPU	-8%	-12%	-14%	-4%
T1 disk	-14%	1%	-21%	-6%
T1 tape	-1%	-7%	-24%	-3%
T2 CPU	-24%	-13%	-7%	27%
T2 disk	-28%	-7%	-22%	-30%

ALICE

- The recommendation for ALICE was left open from the previous RRB
- Over the summer ALICE numbers were updated:
  - Reduced Tier 2 CPU need 438 → 398 kHS06
  - Bugs fixed in calculations
  - Error in 2019 assumptions corrected
- Ratio of data/MC left as question for LHCC

- C-RSG for 2018:
  - Accepts tape reduction and Tier-0 disk reduction
  - Accepts Tier-1 disk space already pledged by Funding Agency
  - Does not have enough information to make recommendation on CPU and disk space at Tier-2

From LHCC (1st Dec)

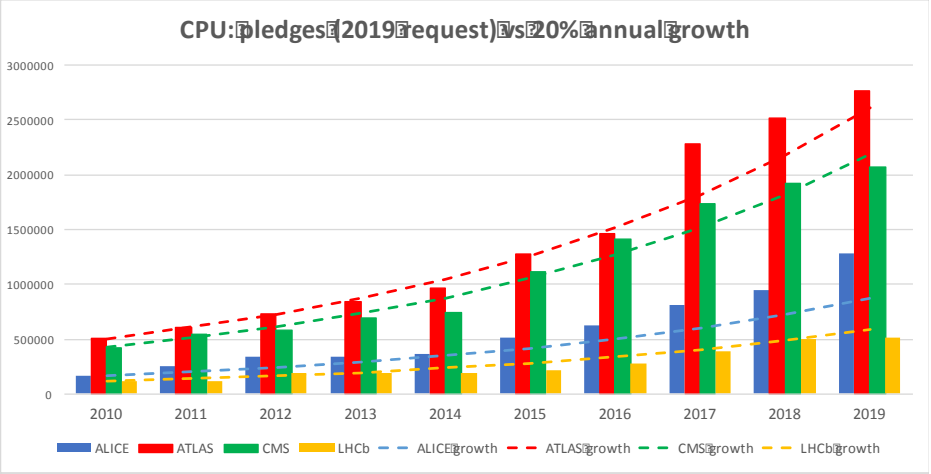
- From the minutes of the LHCC:
  - "ALICE presented updated parameters for its 2018/19 resource request, in particular a MC/raw data ratio of 1.4 for pp and 0.3 for PbPb, which is endorsed by the LHCC."
- In the slides of the referees:

Referees suggestion:

- approve latest resource request (1.4 pp, 0.3 PbPb)
- Avoid additional resource requests in the future by giving solid, realistic, and transparent estimates based on scientific goals

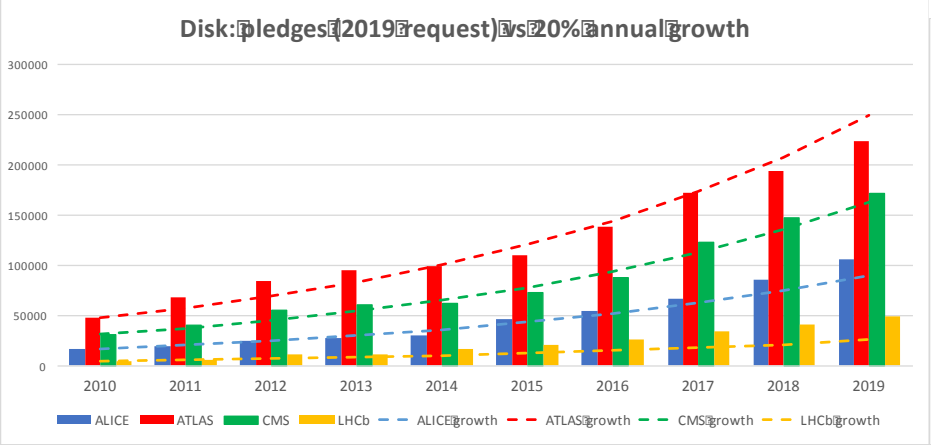
2019

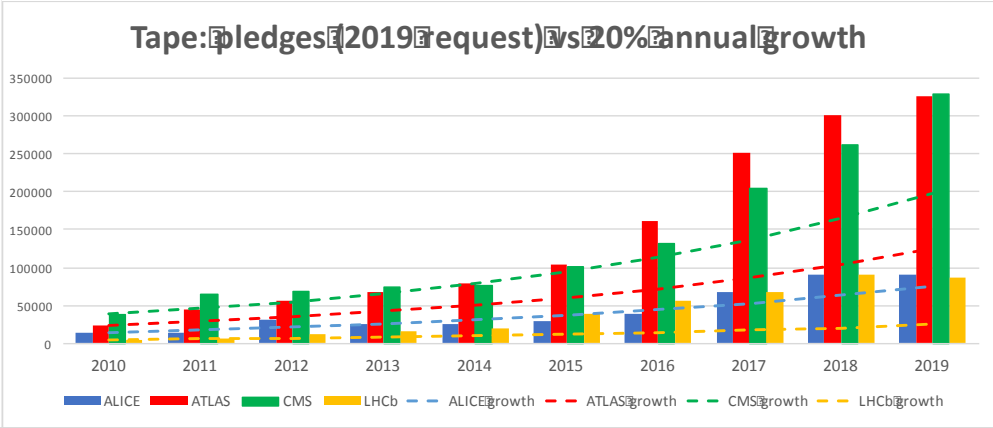
- Preliminary requirements discussed in the RRB are now in REBUS
- To be ratified by C-RSG for April RRB



Evolution of the pledges (for 2019 the requirement is shown)

Curves are 20%/yr evolution from 2010





Estimating Run 3

Preparing for Run-3

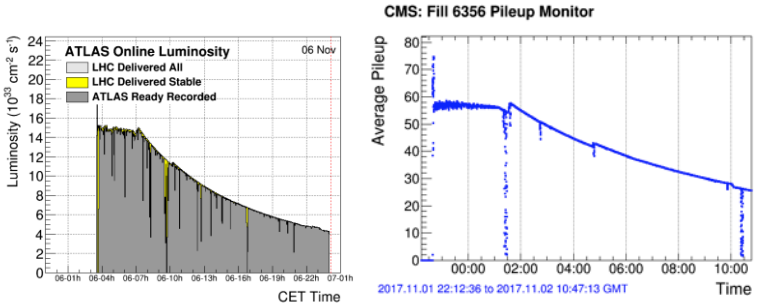
- WLCG started a process to understand the resource needs for Run-3 (ballpark estimates)
- There are a lot of uncertainties and with the help of the LHCC we would like to conservatively define the expectations for the main input parameters driving the needs. We need guidance to resolve those uncertainties

1) Run-3 integrated luminosity
   - We expect at least 150 fm-1 of pp (=Run1+Run2) spread across 2021-2023. Is 150 realistic? How uniform across 2021-2023? HI runs?
   - How many seconds of data taking in one year we expect? Current estimate around 7M.

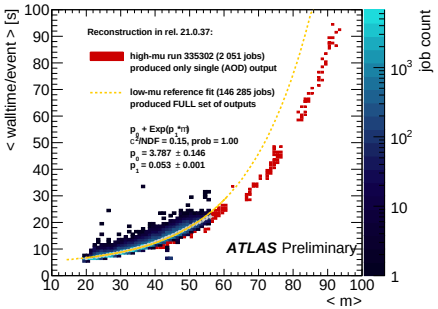
2) Run-3 instantaneous luminosity and pileup
   - Goal luminosity is 2.5*10**34. What is the expected pileup profile? How long is expected to be a fill in average?
   - At which point ATLAS and CMS would level?

3) Trigger rates
   - What are the expected trigger rates and what is the impact of leveling?

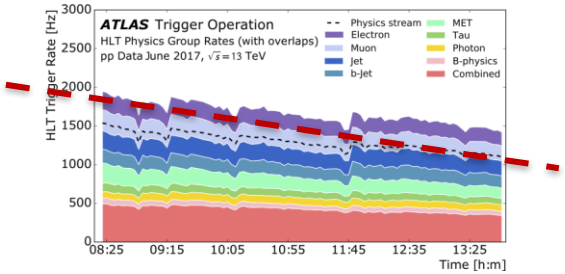
Some implications of Run-3 parameters based on Run-2 experience



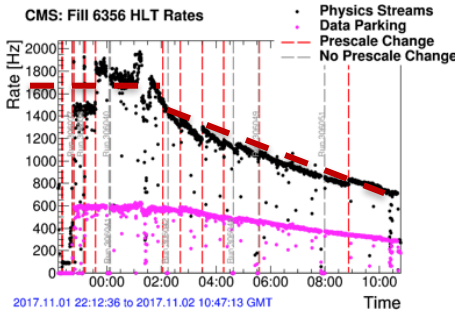
CMS and ATLAS level at similar thresholds now,
Approximately at pileup ~55 for up to 4 hours.



Reconstruction time can increase
up to x2 between mu=40 and mu=55



A run in June: mu~40 and no leveling:
1kHz average of HLT output rate



A run in October:
mu~55 with leveling:
>1kHz average of HLT output rate

LHCC comments

- The **LHCC recognises** the need of a baseline for the run 3 machine running conditions to guide the WLCG in its resource planning, and requests such information to be provided to the WLCG as soon as possible.

- Hopefully, more input following Chamonix meeting in January
  - About 2018 and Run 3