

First estimates for Run 3

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Run 3 – run conditions

- Run 3 scheduled to start 2021 and end 2023
- However, indications from machine group 2021 likely to be very “light” year – like 2015
 - Major accelerator upgrades, slow start, ramp up
- Goal for Run 3 is 150 fb^{-1} (x2 Run1+Run2)
- Needs to be achieved in ~ 2 years
 - $\rightarrow 75 \text{ fb}^{-1}$ per year (= 50% more than 2017)

Run 3 – first thoughts

- Goal of Luminosity is 2.5×10^{34} (starting at 2×10^{34})
 - Already close to that today
- Intention is more bunches – to help reduce pile up
- But likely to have luminosity levelling for ATLAS and CMS with pile up close to that of today
- BUT means that large part of fill has max. pile up

- Trigger rates stated as 1 kHz (ATLAS, CMS)
 - But often more even now – esp. at start of fill
 - Effective trigger rates could be higher than 2017 with levelling

ALICE and LHCb?

- Rates for ALICE given in O2 TDR
- LHCb producing TDR ~now

- Need some validation of these

Likely needs

- Previous hand-waving arguments – we (Tier0) have assumed x2 for Run 3 wrt 2018
- Conservative estimates are 1.5x
- What should we use for planning???

Estimates – CPU

MHS06	2018	2021	increase
ATLAS	2.52	3.8	50% est.
CMS	1.92	2.9	50% est.
ALICE	1.06	1.4	40% TDR
LHCb	0.48	1.0	100% est.
Total	6.0	9.1	52%

- Need to firm-up estimates
- Need same for storage

This is minimal scenario – many uncertainties!

Care is needed

- If we underestimate we could have problems
- Over estimation does not look good for funding agencies
- Factor 2 in 2022 is ~consistent with Moore's law (flat budget from 2018)
- If we ask for too little (less than flat budget)
 - risk that baseline for “flat” is lowered – and that would be a disaster for Run 4
- Need to present these to LHCC (2 weeks, Feb 2018) for their comments and agreement