

Estimates for Run 3

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Running conditions – 2018

□ Anticipated:

- Luminosity: 2.0×10^{34}
- 25 ns spacing - BCMS
- 2544 bunches, with $1.15\text{-}1.3 \times 10^{11}$ protons/bunch
- Luminosity levelling at pile-up of ~ 55
 - → average is now ~ 45 (cf 35 in 2017)
 - → Reconstruction CPU needs 20-25% increased
- Integrated luminosity: 60 fb^{-1} (cf 45 in 2017)

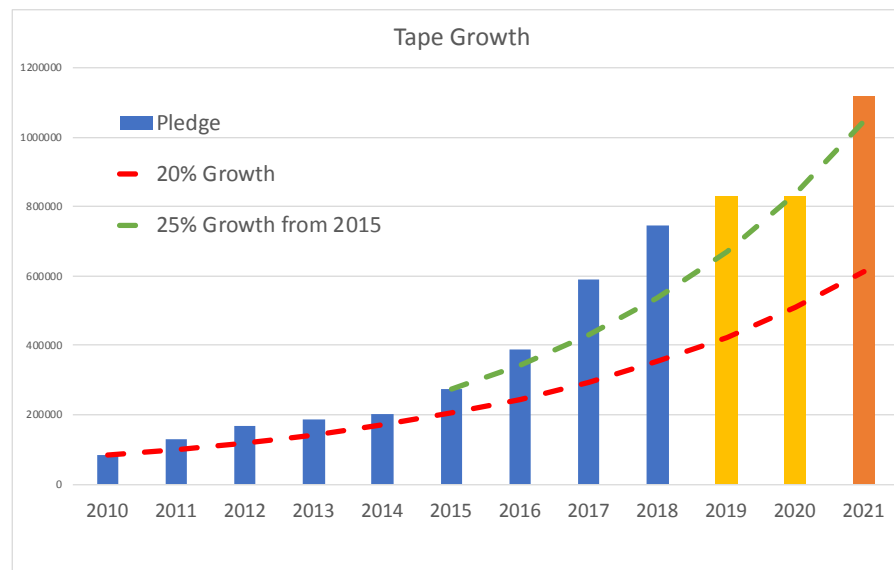
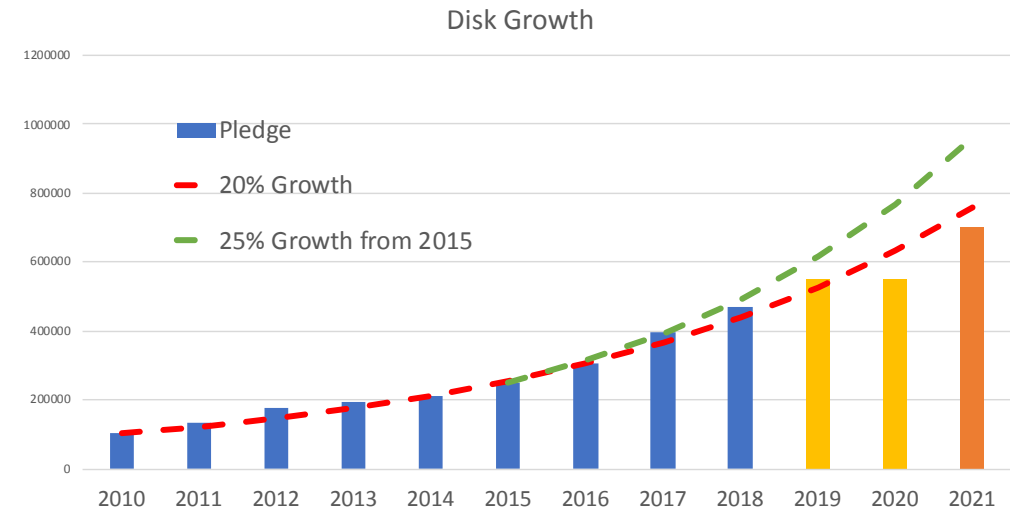
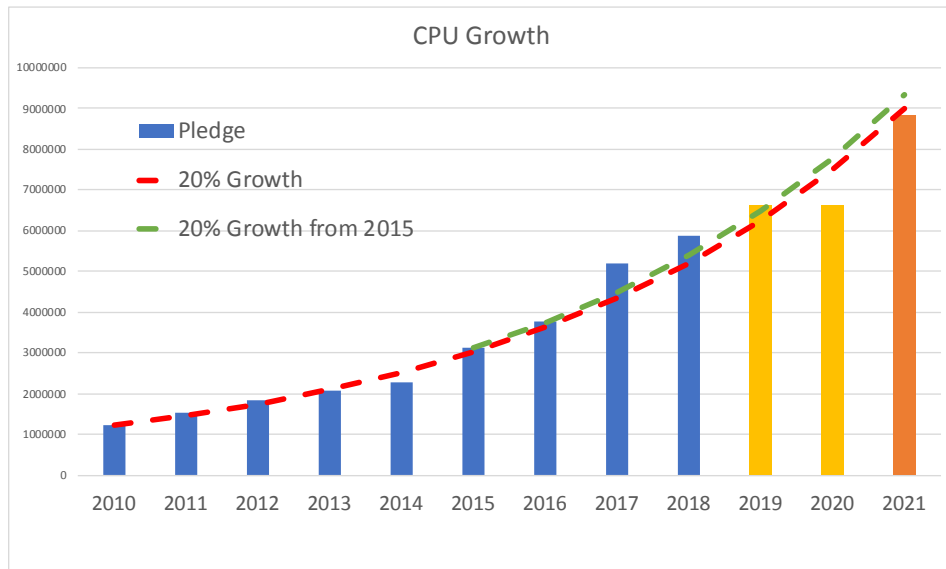
Run 3 running conditions – 1

- ❑ Following discussion with LHC operations
- ❑ Still many unknowns
 - E.g. experiment planned trigger rates are tbd
- ❑ Expected conditions:
 - 7 TeV per beam, gives small reduction in beam size
 - The main limitation is the heat load in the cryogenics
 - Expect BCMS filling scheme; 25ns
 - 2544/2556 bunches, $\beta^* = 27\text{cm}$
 - 1.3×10^{11} ppp
 - 2×10^{34} (could be a bit higher) is the limit due to the inner triplet cooling
 - This will not change in LS2
 - This is a pile up of ~60

Summary:

- ❑ Similar to 2018
- ❑ If the experiments luminosity level at a higher pile-up and for longer →
 - higher average pileup (especially if HLT limitations are removed during LS2)
 - Non-linear increase in CPU time
- ❑ Possibly less time between fills – more live time
- ❑ Overall the best estimate is 30% (50% conservatively) more resources needed than in 2018
 - But we have not seen 2018 yet
- ❑ For 2021: 1st year after LS2, could be only half-year live time but ramp up to optimal conditions rapidly
- ❑ Unknown:
 - Still need plans for experiment trigger rates
 - And plans for luminosity levelling

Resource evolution



- 2010-2018 – pledges
- 2019, 2020 assume same as 2018
- 2021 assume 1.5 x 2018