

GridPP

UK Computing for Particle Physics

Tier-1 Strategy - Progress

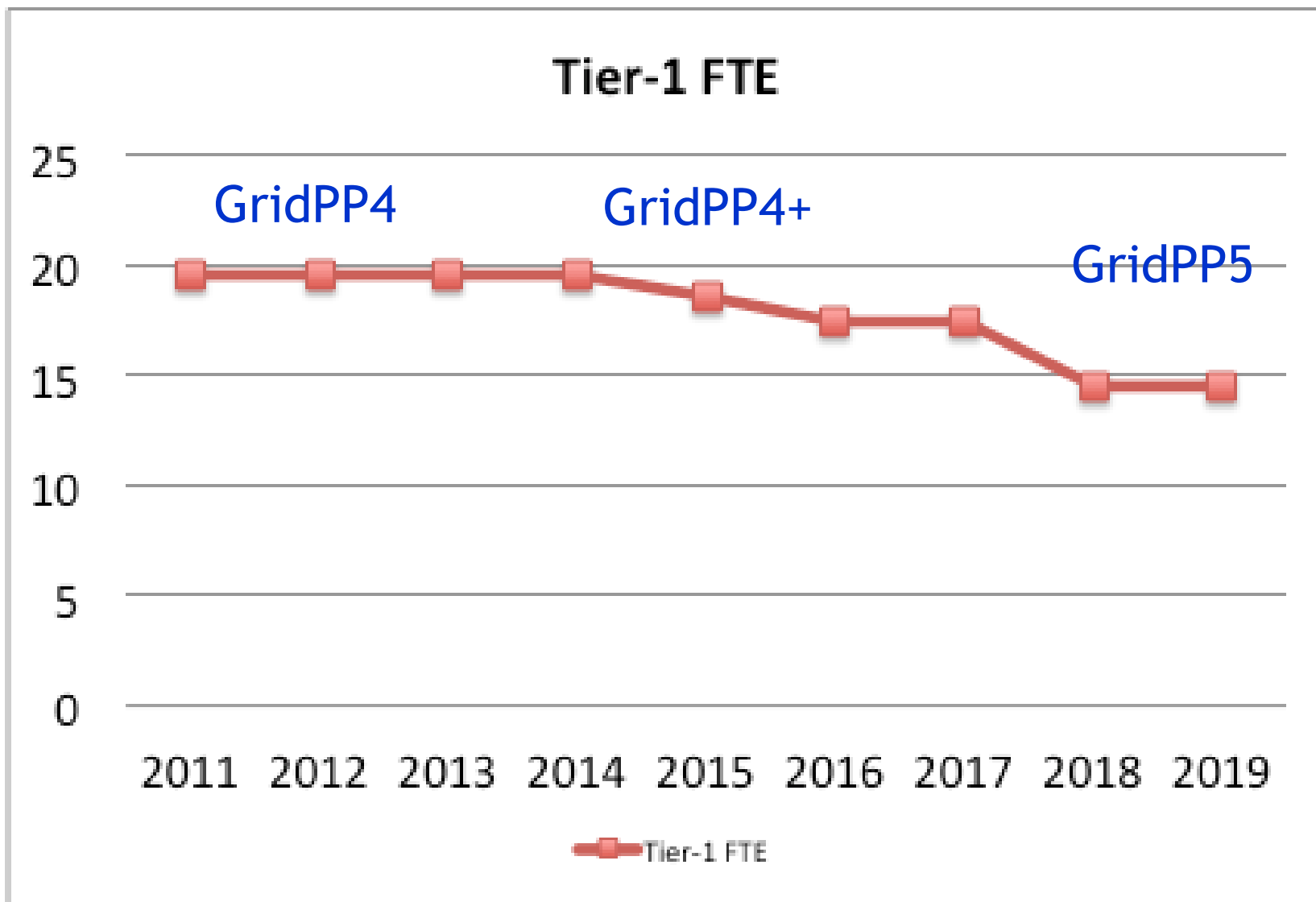
Andrew Sansum

1st September 2016



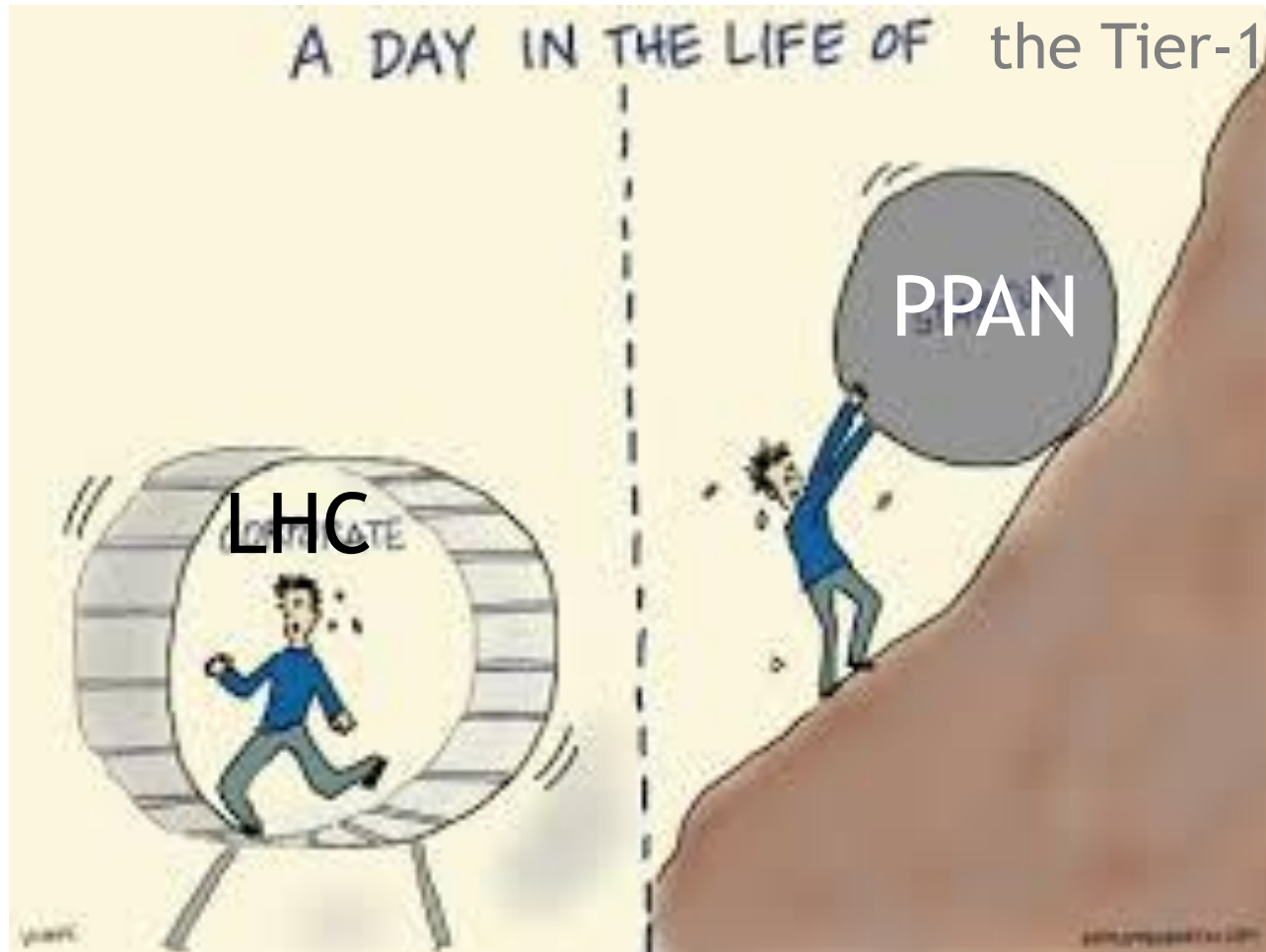
Science & Technology Promotion Council
Rutherford Appleton Laboratory

- GridPP5 Staffing Challenge at the Tier-1
- What we promised to STFC
- New communities engagement update
- Continuing to seek efficiency savings
- Costing model for a UK-T0





- Increase relevance to other communities
- Share costs (additional income)
- Reduce cost for PP Community

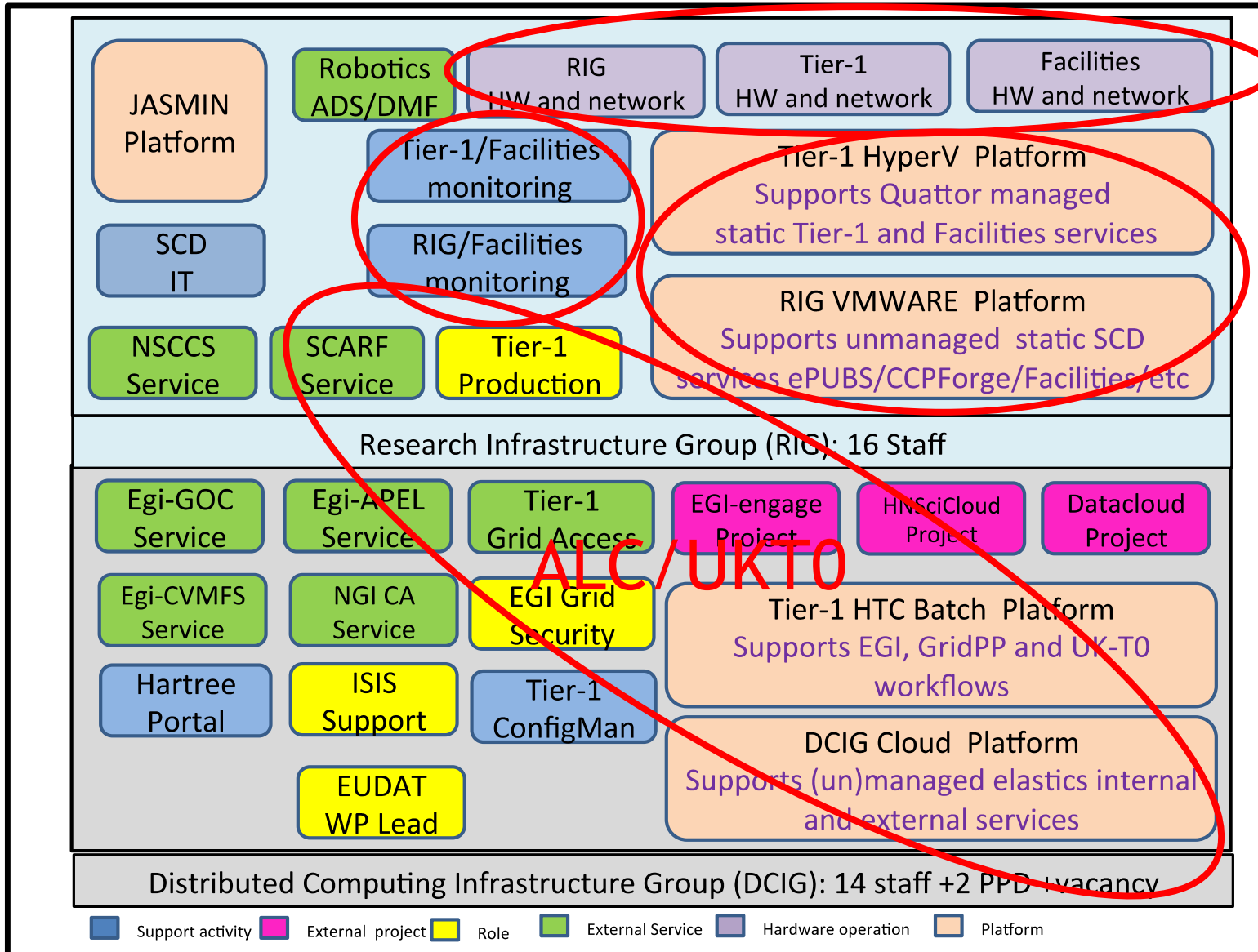




- DiRAC Storage at Tier-1 (Brian's talk) moving towards full production
 - But need to ensure clear understanding of GridPP commitment
 - Resolve cost of providing tape capacity (not in GridPP5 proposal)
- SKA - AENEAS proposal funded by Horizon 2020. Modest funding to SCD/Tier-1 (2PM per year). Joint funding with existing GridPP posts for:
 - Technology foresight and modeling for European regional computing.
 - Data transfer interoperation
- Joint AAI project between GridPP (Jens), DiRAC and Archer (3PMs). Bridge authentication into GridPP x509
- EUCLID - established on classic UI, LOFAR - no news.



- Historically the Tier-1 has been operated by a team solely focused (dedicated) on LHC computing.
 - Separate group (RIG) runs JASMIN and STFC infrastructure)
- Large effort by Tier-1 during GridPP4 to gain efficiency through improved processes and deployed technology:
 - Virtualisation
 - Configuration management
 - Automation and standard operational processes
- Similar activity within RIG. Further savings can only be achieved by merging SCD teams delivering systems infrastructure.
 - Single group (Nick Hill) running all SCD network, hardware and infrastructure management, Tier-1 operations.
 - Ian Collier's group focusing on e-Infrastructure projects and middleware
 - Alison Packer's group (Data Services) running storage systems and DB



- Simple Example to illustrate the challenge. Non GridPP VOs

Experiment	Needs
Alpha	25% extra CPU and will use the GridCE and needs to make an availability commitment + pledge resource
Beta	25% extra CPU, 25% extra disk, 50% extra tape but don't want any Grid services but have own special systems that need to be operated
Gamma	Only wants 25% extra disk but needs us to develop an API, will use FTS. Needs excellent data retention
Delta	50% extra CPU and wants to submit jobs by logging in and using classic qsub.

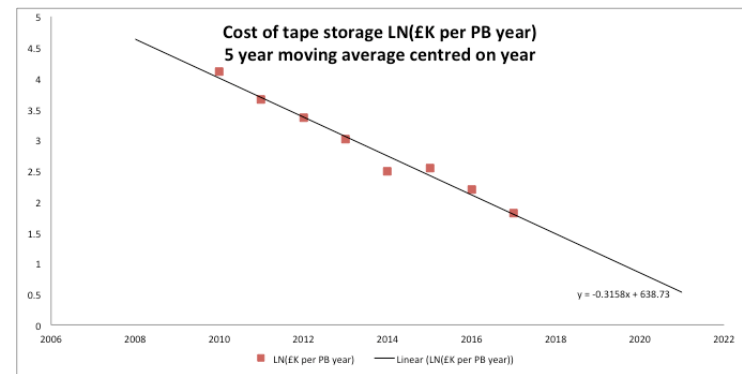
- Hardware cost? Extra Tier-1 staff effort? What share of existing T1 staff for grant proposal?

- GridPP micro-models annual hardware cycle. Knows what hardware generations exist and projects HW phase-out. Projects hw price, annual purchase plan and grant request.
 - Difficult to extend model to new communities. Must avoid single “one off” hardware purchases. Annual procurement cycle works well for GridPP need to be able to integrate new communities funded through different grant mechanisms.
- Instead calculate annual hardware “rental” cost. In 2016:

Tape: £8.2K per PByr

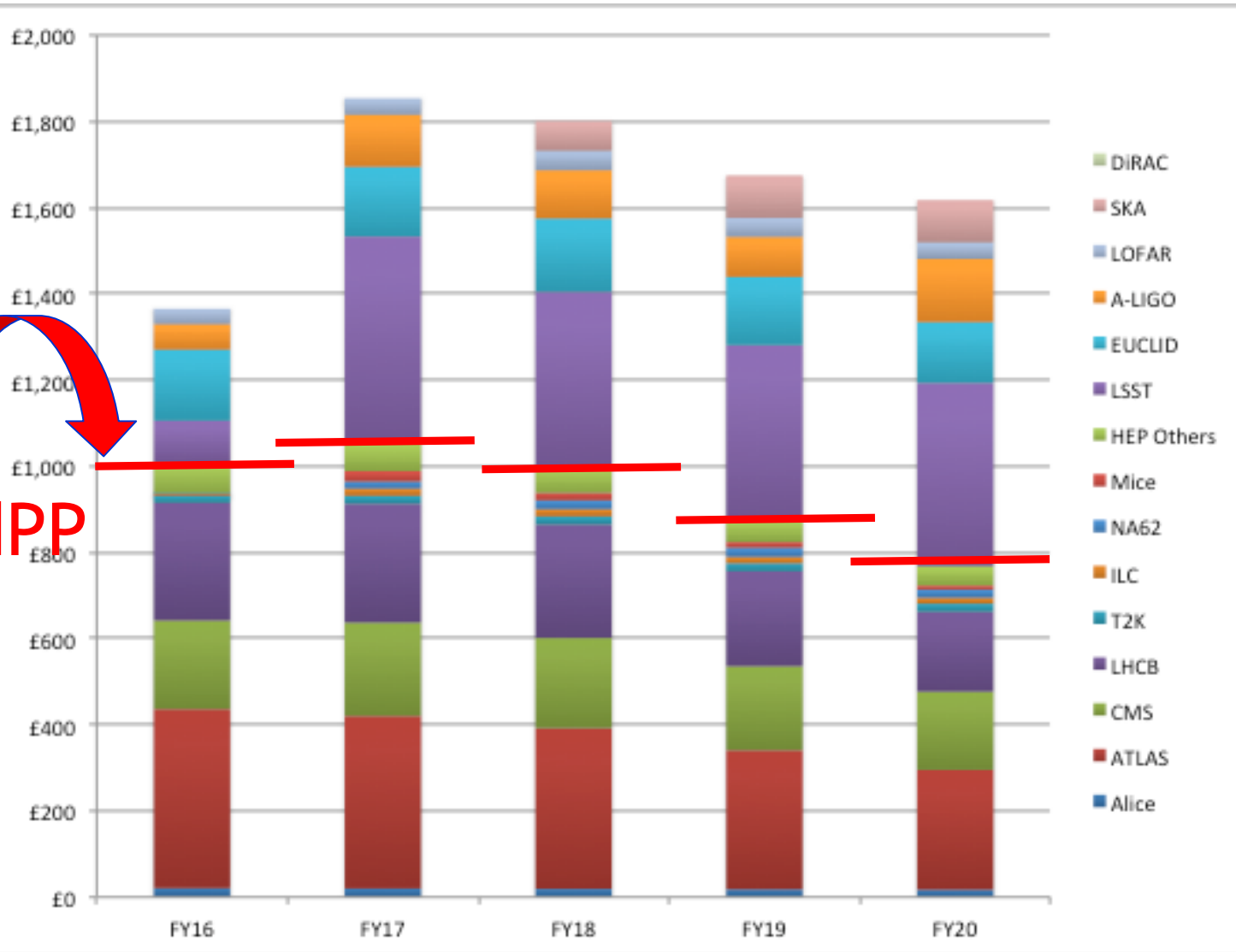
Disk: £24K per PByr

CPU: £2.4K per kSH06yr



Annual HW Costs for a UK-T0

£K



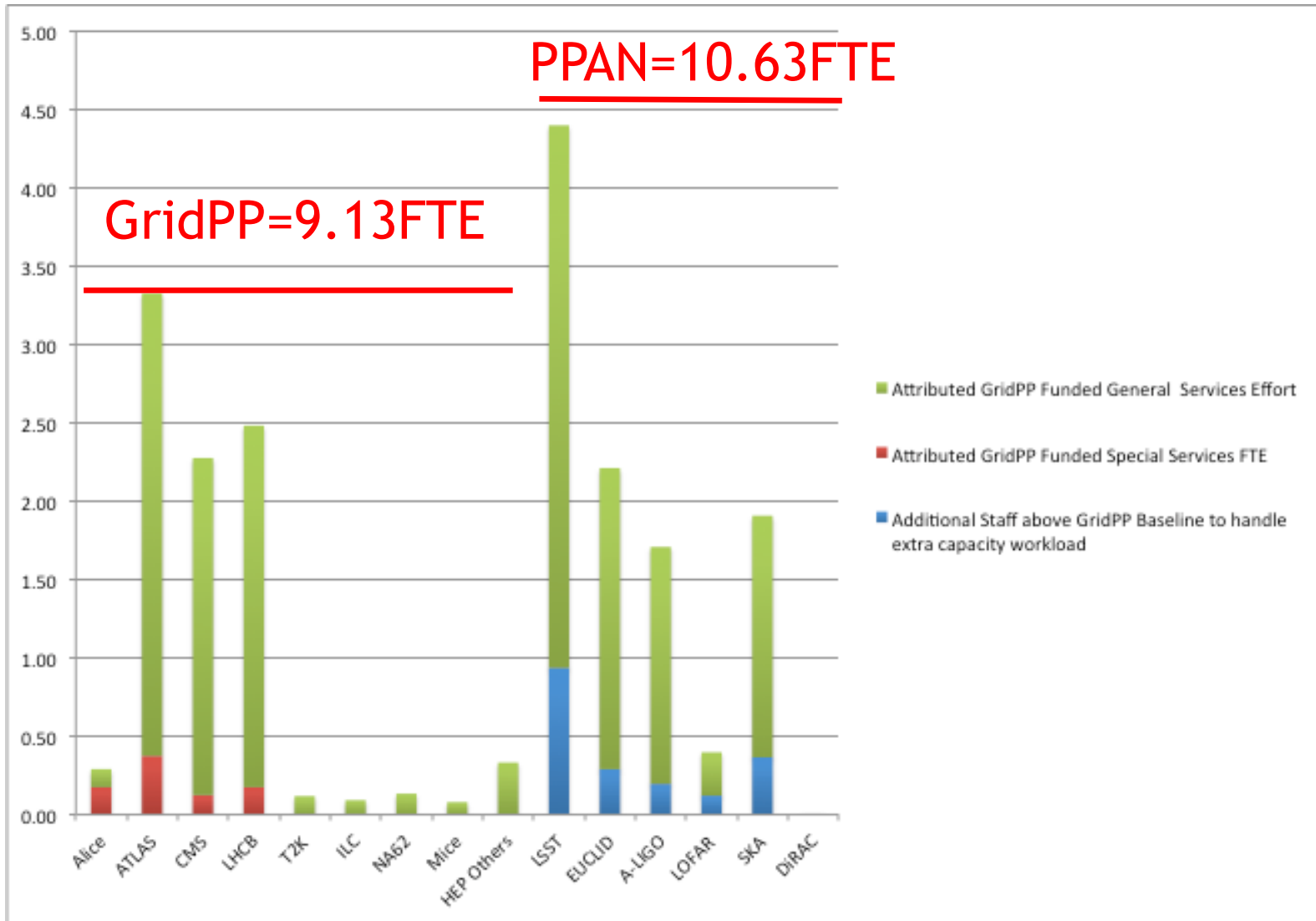
GridPP

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- How much extra does it take to run extra hardware.
 - Eg if just 1 extra VO wants 100% extra kit, 4 Vos 25% extra each.
- Build model of Tier-1 staff effort. Several components from GridPP5 proposal:
 - Core underpinning infrastructure (5.7)
 - Scaling capacity component: disk, tape, CPU (6.1 FTE)
 - Shared Services (eg Grid services) 2.1 FTE
 - Private services (eg ATLAS frontier) 0.85
 - Development effort - currently CEPH, Cloud, Mesos, IPV6 (3.1)
- Calculate marginal-extra new staff VO must contribute for
 - Extra capacity (try SQRT of capacity increase!). Eg double=40% extra capacity component. $4\text{VOs} * 25\% \text{ increase} = 4 * 12\% = 50\% \text{ extra} = 3 \text{ FTE}$
 - New private services - bespoke estimate per service
- Estimate what share of existing staff VO must request





- Considerable activity within the Tier-1 to engage with external parties.
- Huge change compared to 3 years ago. Team used to be effectively completely dedicated to LHC computing.
- Need to adequately sustain our LHC computing delivery while generating new opportunities and exploring synergies.
- Very exciting time but still hard to be clear what the future holds.