

# DiRAC

## Update

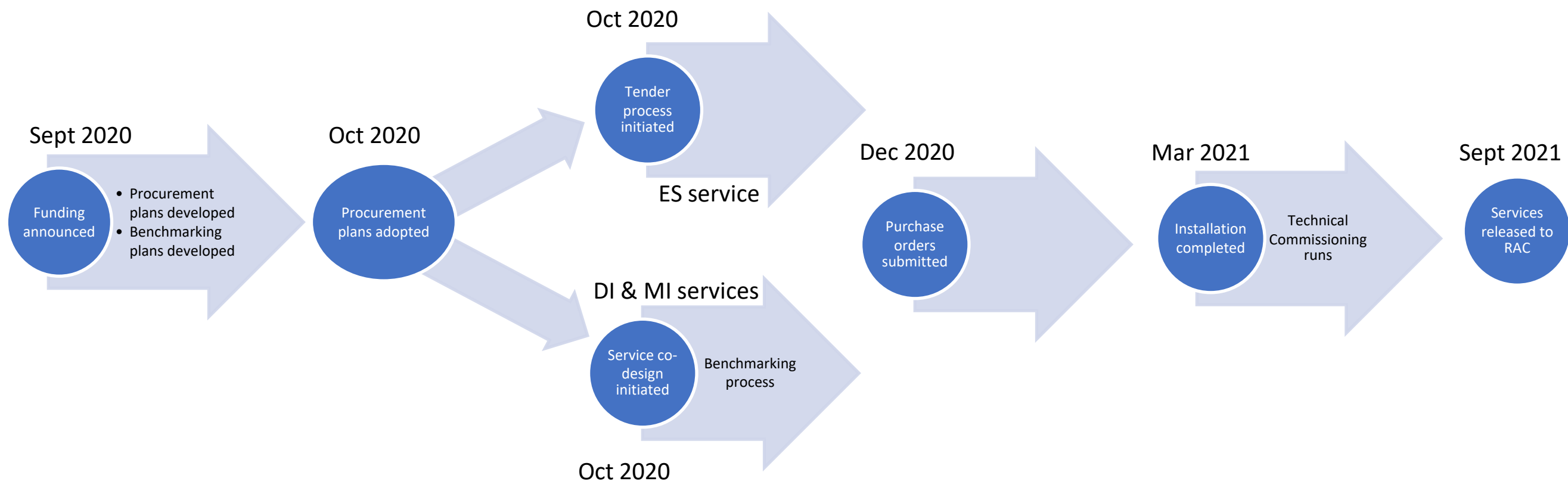
Mark Wilkinson, Director

Durham ICC lunchtime meeting  
26<sup>th</sup> April 2021

# DiRAC-3 Phase 1

## UKRI World Class Labs funding

- DiRAC awarded £20m in capital funding to deploy Phase 1 of DiRAC-3
- WCL funds are intended to provide “*critical investment to maintain and upgrade equipment and facilities*”



- Technical Commissioning: goal is to optimise systems to deliver DiRAC-3 science programme
- RAC process for October 2021 to March 2022 will be announced shortly
- RAC14 process will follow usual timetable for allocations for April 2022++

# DiRAC-3 Phase 1 - hardware

## Memory Intensive

### “Cosma 8”

- Supplied by Dell
- Hosted by Durham
- 360 CPU nodes (46k cores):
  - 2x 64-core AMD Rome 7H12 CPUs
  - 1 TB RAM
- Non-blocking HDR200 network
- 2x 4TB fat nodes (AMD 7702 CPUs)
- 2x 2TB login nodes
- 6.7 PB disk storage
- 1.2 PB SSD volume
- 20 PB tape storage

## Data Intensive - Leicester

### “DiaL”

- Supplied by HPE
- 200 CPU nodes (26.5k cores):
  - 2x 64-core AMD Rome 7742 CPUs
  - 512 TB RAM
- 3:1-blocking HDR200 network
- 4 PB disk storage

# DiRAC-3 Phase 1 - hardware

## Extreme Scaling “Tursa”

- Supplied by ATOS
- Hosted by Edinburgh
- 112 GPU nodes (4.4 PF):
  - 4x A100-40GB Nvidia GPUs
  - 2x AMD Rome 7302 CPUs
  - 1 TB RAM
- 6 CPU nodes:
  - 2x AMD Rome 7H12 CPUs
  - 256 GB RAM
- Non-blocking HDR200 network
- 4 PB disk storage
- 8 PB tape storage

## Data Intensive - Cambridge “CSD3”

- Supplied by Dell
- 260 CPU nodes (~20k cores):
  - 2x 38-core Intel Icelake CPUs
  - 512/256 GB RAM
- 3:1-blocking HDR200 network
- 5 PB disk storage
- 21 GPU nodes (0.8PF):
  - 4x A100-80GB Nvidia GPUs
  - 1TB RAM
  - 2x 64-core AMD Rome CPUs



# DiRAC-3 Phase 1

- Very significant increase in resources:
  - COSMA8 has 3.5x number of cores on COSMA7
  - Tursa PF is 2.6x Tesseract PF
- New architecture
  - Think now about how to exploit it....
- Improved power efficiency
  - all new systems use direct liquid cooling

Other aspects of Phase 1 activity:

- 5 RSEs
- Data curation service pilots

# Innovation placements

- Recent addition to DiRAC training portfolio
- 6-month placements for PhD students and early-career PDRAs
- DiRAC was initially awarded funding for 8 placements by STFC
  - 12 supported to date



- Funding for at least 3 more placements in 2021 provided by DiRAC-3 partners - more details soon
  - Ideas welcome
- Benefits include:
  - Bi-directional knowledge exchange
  - Enhanced employability
  - Experience of working in industrial environment
  - Skills development

# Other training opportunities

## Hackathons

- Recent: AMD GPU
- Upcoming: Nvidia GPU; AMD CPU

## Upcoming workshops

- OpenACC - delivered by Nvidia
- Cuda - delivered by DiRAC Training Manager Richard Regan

## AI-athon

- ML course supported by STFC SciML team

# Summary

- DiRAC-3 Phase 1 deployments are imminent
  - Very significant uplift on all services
  - Start thinking now about how to exploit them
- RAC process for Oct-Mar period will be announced soon
- RSE effort available to support code optimisation
- Training opportunities to help prepare for new systems.