Dynamic Batch System Extension into the HNSciCloud

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Dynamic computing needs

- High Energy Physics and Computing at KIT
  - Running a major T1 site in the WLCG
  - Active research groups in CMS, Belle and AMS with R&D in HEP computing
- Increasing demand for computing resources
  - Fluctuating demand for resources due to conferences and paper deadlines
  - More resources reduce analysis turn around cycles
  - Always on the lookout for opportunistic resources to supplement the dedicated in-house ones and cover peaks in demand

![Graph showing demand of resources over time at KIT](image)
Dynamic Extension of Batch System

- Users interact only with batch system to submit jobs
- Request and integrate resources from cloud provider on demand
- Tools for dynamic lifecycle management developed at KIT
  - ROCED (based on job queue length)
  - COBalD & TARDIS (based on resource usage)
- Data streamed from KIT and other sites over GEANT

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Dynamic Batch System Extension

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Project outcome

- About 55,000 successful user jobs which contributed to the HEP analysis activity at KIT
- Positive feedback from users
- Efficient usage of dynamically allocated computing power for about half a year
- Improve our readiness to extent further cloud providers
  - tools, management, experience, resource scheduling, integration