

Natural job drainage and power reduction in PIC Tier-1 using HTCCondor

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Introduction

Preliminary studies and ideas to understand **natural job drainage** and **power reduction** in PIC Tier-1, which is using HTCondor

Analyze historical logs from HTCondor to **understand natural job drainage** patterns: when jobs naturally conclude without external intervention

This analysis could reveal daily or seasonal **patterns** (or a lack thereof) in job drainage, while also providing **insight into expected levels of resource reduction over time**

- It would help us understand how quickly we could scale the farm to adapt to external factors, such as green power availability cycles
- Studies carried out by K. Fabrega (last year Physics degree student)

Live demo →

Next steps

Conduct **extended simulations to observe drainage patterns** across varying load conditions

Analyze the **impact of job types** and **VO-specific job durations** on natural drainage: how different workloads contribute to natural drainage cycles

Estimate **power consumption** before and after drainage (*ipmitool*)

Evaluate **potential carbon emission reductions** in these drainage scenarios

Develop **machine learning models** for predictive power scaling

Design a **feedback loop to HTCondor for real-time power modulation** based on green energy cycles

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Thanks!
Questions?