

Advancing Opportunistic Resource Management via Simulation

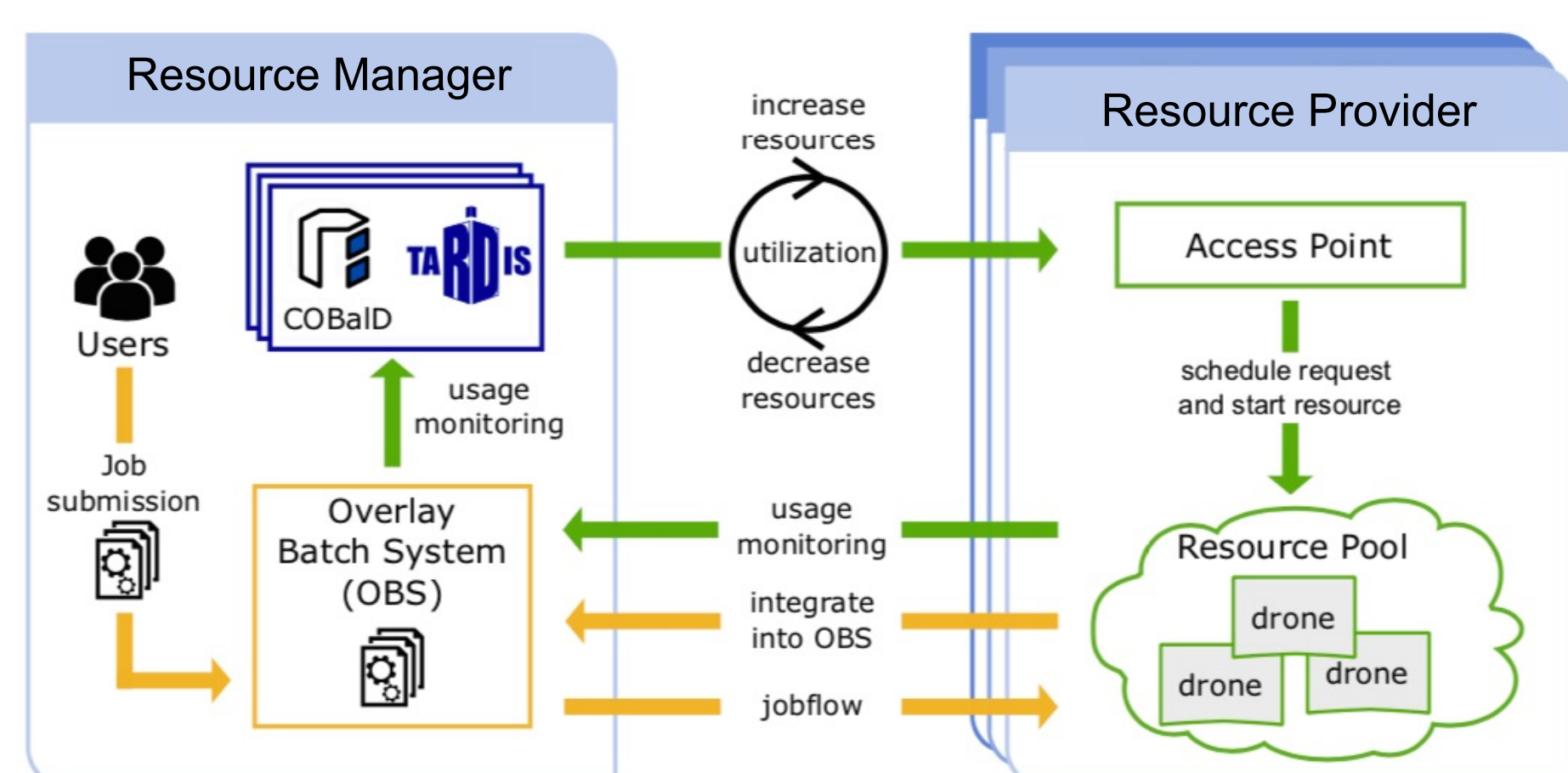
Advanced Computing and Analysis Techniques in Physics Research (ACAT) 2022

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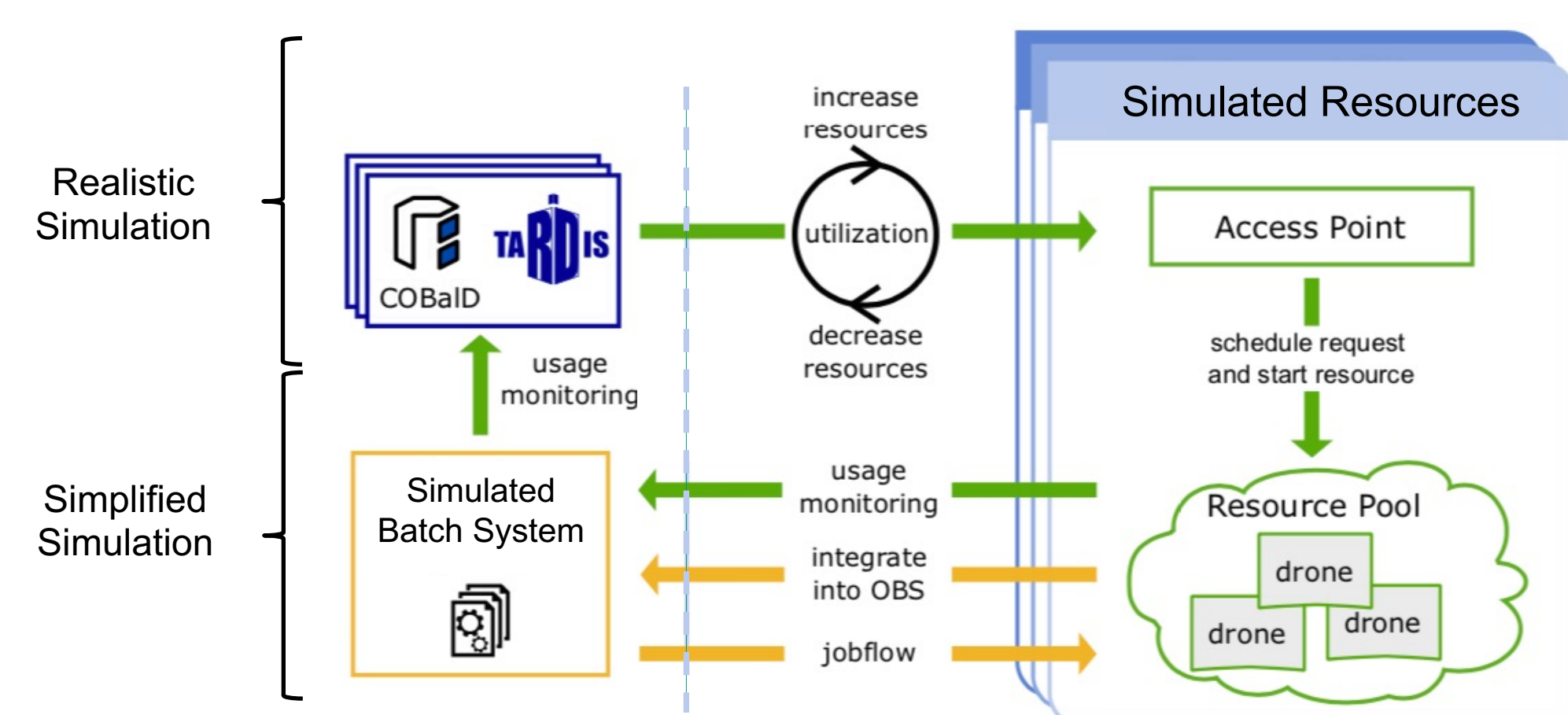
Background and Use Case

- Goal: HPC, Cloud and similar resources for HEP
 - External to WLCG with various usage policies
 - Limited/temporary demand for special resources
 - Many unknown and uncontrollable variables
- COBaID/TARDIS approach to resource management
 - Reactive approach to observed usage/demand
 - See [poster #30](#) for production deployment

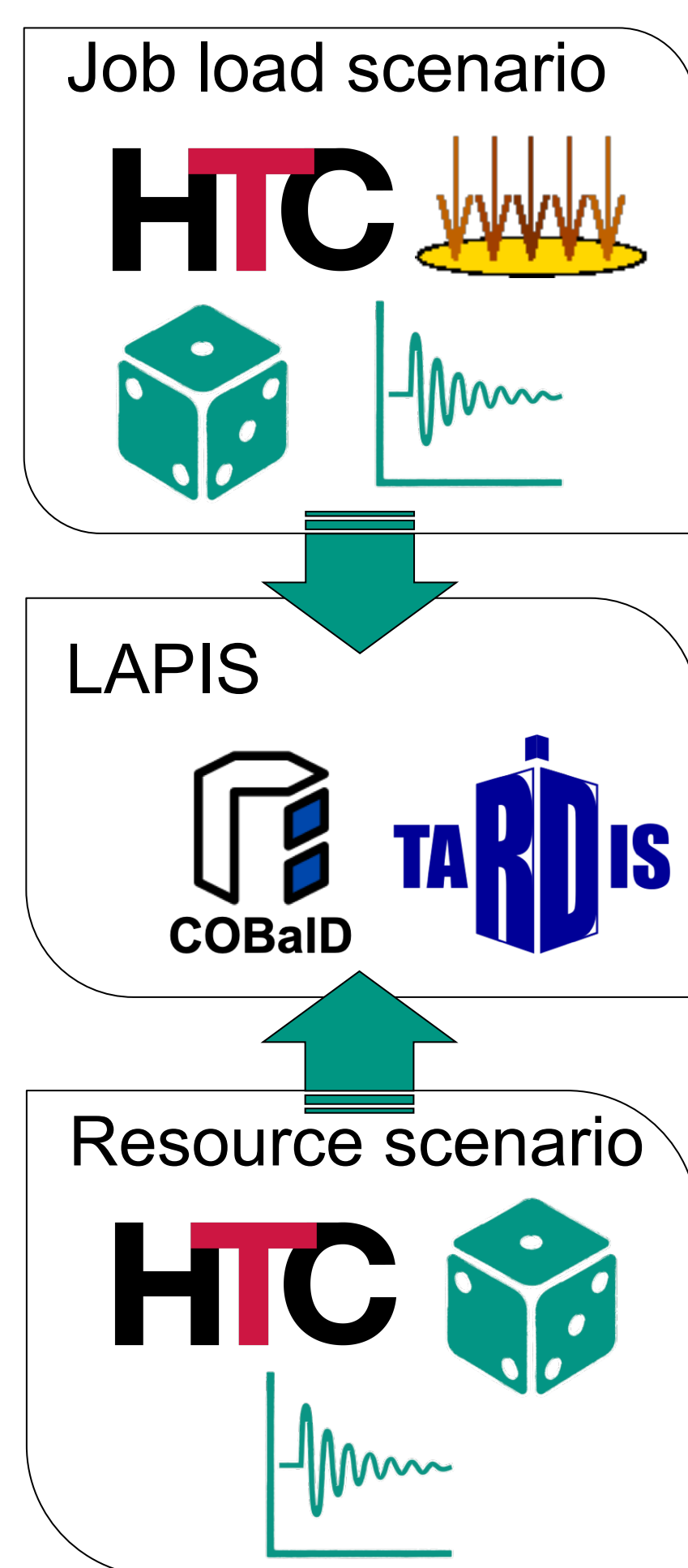


The Lapis Simulator

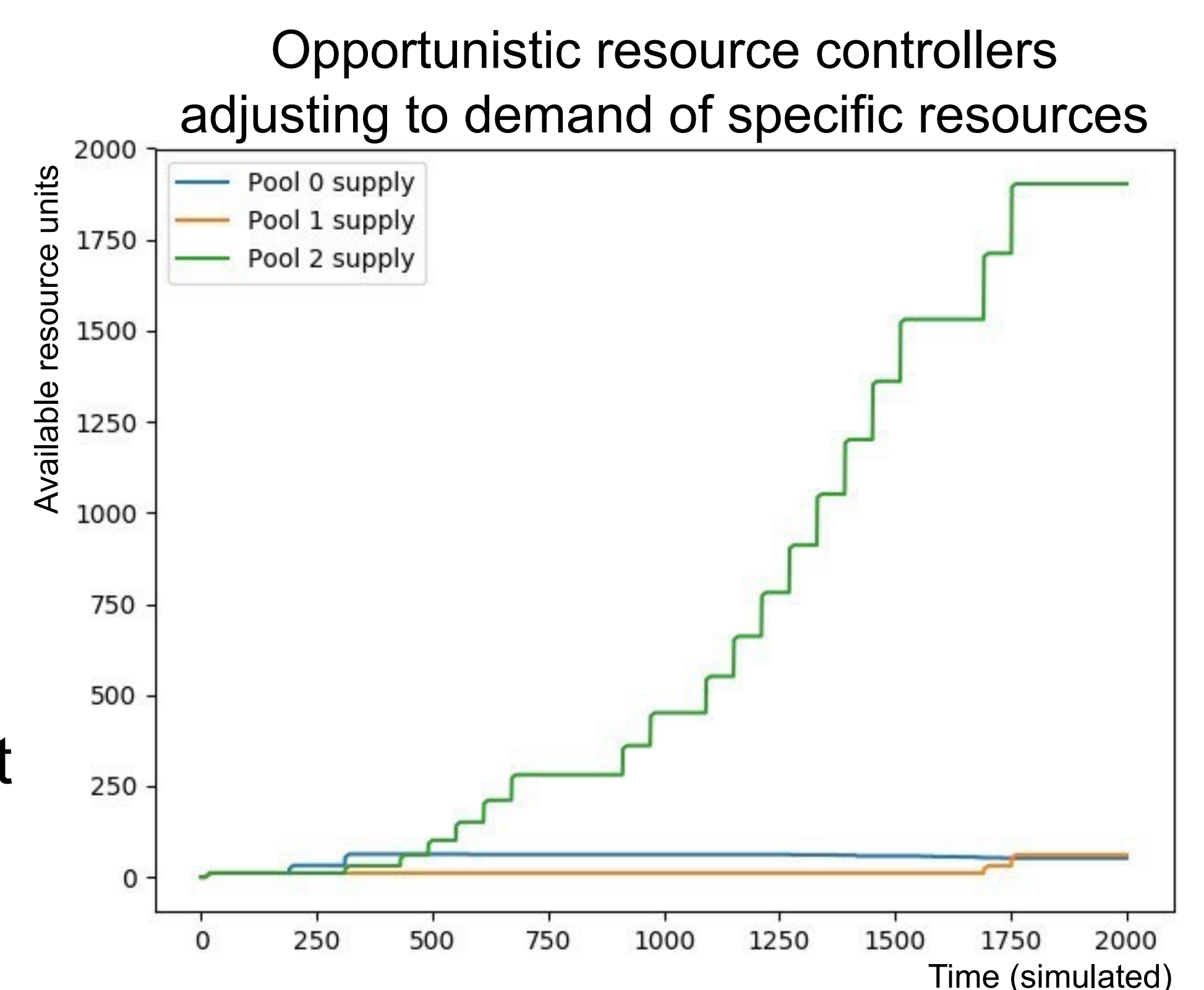
- Mock-up of resource management and providers
 - Simulated resources, jobs, schedulers, ...
 - Naturally expresses overlay batch systems
 - Designed for highly concurrent behaviour
- Integrates with resource manager framework
 - Simulate all asynchronous operations and events
 - Examine decision logic in controlled environment



Investigating Opportunistic Resource Management



- Create reproducible and controlled scenarios
 - Repeat the same case with different approaches
 - Try the same approach for different cases
 - Observe emergent behaviour of multiple agents
- Investigate synthetic and recorded scenarios
 - Find better strategies for common situations
 - Replay situations with unsatisfying results
- Example: Separate managers for different resources
 - Each pool with specific CPU and Memory request
 - Separate COBaID/TARDIS manager per pool
 - Pool resources are joined into one batch system



[1] <https://www.cs.huji.ac.il/labs/parallel/workload/>



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