Parallelldatorcentrum

A Black-Box Approach to Performance Analysis of Grid Middleware

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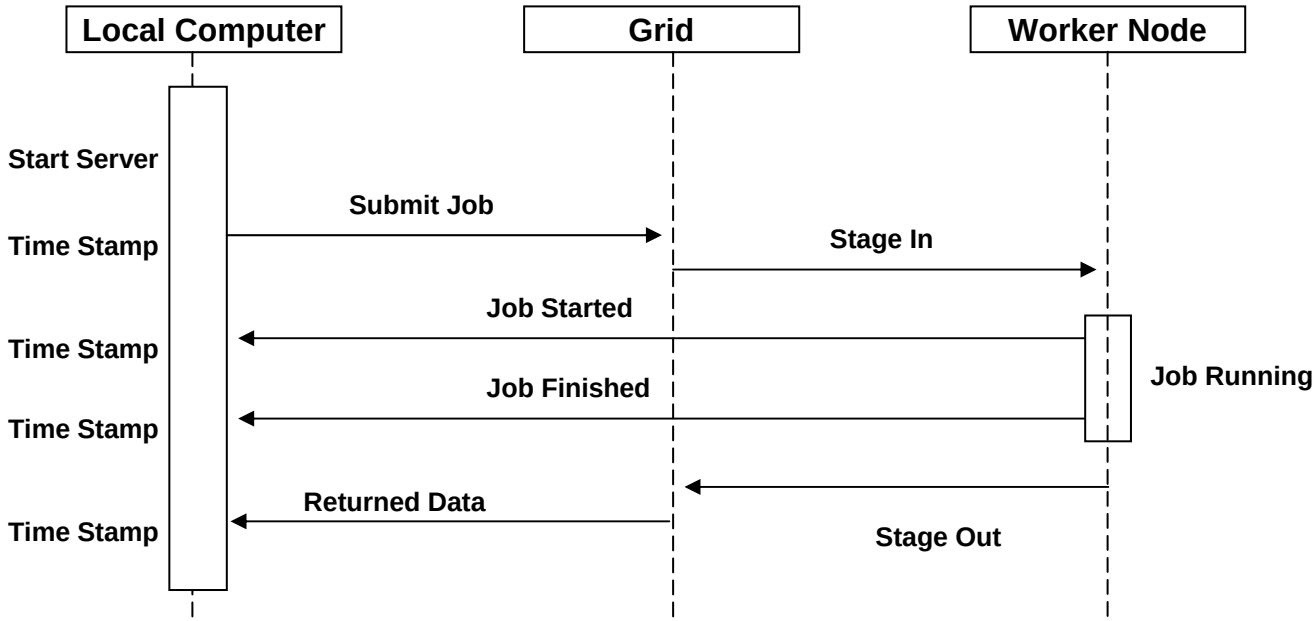
Outline

- **Introduction**
- **Design**
- **Proof of concept**
- **Experimental results**
  - Unicore 5 (non-WS)
  - Unicore 6 (WS)
- **Future Work**
- **Summary**

Grid Middleware Comparisons

- **Tool to perform a non-invasive platform-independent evaluation of different grid middleware**
- **Goal: comparable and reproducible results**
- **Usage:**
  - Compare new and old components within a Grid Mw
  - System administrators to tune the system configuration,
  - Developers to find the bottlenecks and
  - Users can devise more efficient usage patterns
- **Comparing different grid middlewares also possible…**

Time-stamp Diagram



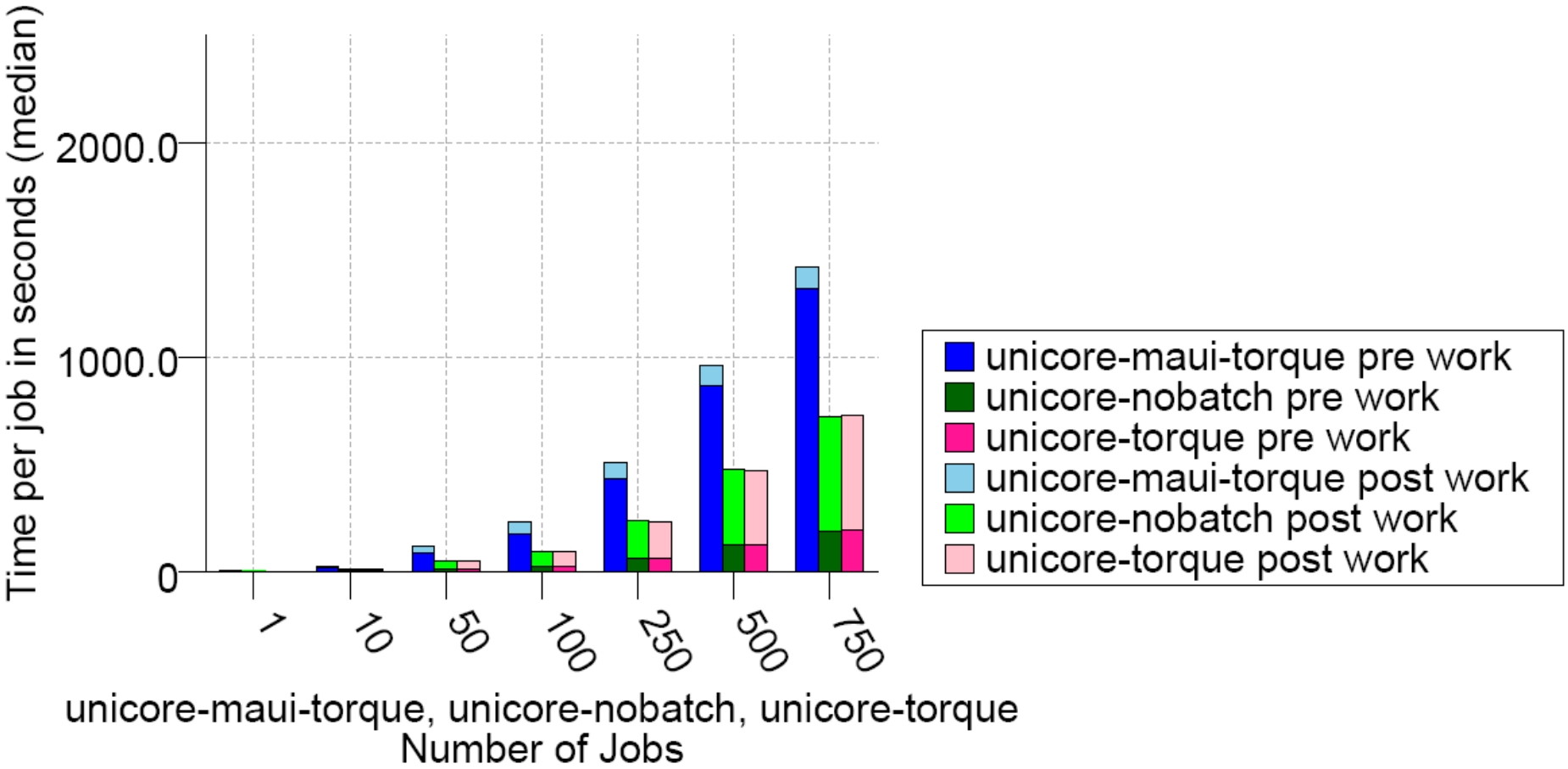
Components

- Submit Script **encapsulates a particular middleware, record timestamps and job metadata.**
- Job**: currently a "no-op" job. Can be easily extended to stress other parts of the grid middleware. Issues call-backs to *server*.**
- Server **jobs issue call-backs to a server when starting and stopping. The server listens for these call-backs and records timestamps when they are received.**
- Output Processor **takes the timestamps and calculates turnaround time, throughput and the pre-work and post-work overhead.**

Proof of Concept

- UNICORE 5
  - The submit script interacts with CLIQ according to the following scheme:
  - Start CLIQ
  - For each job that should be submitted:
    - **Create job description file.**
    - **Copy job description file to the CLIQ submit folder. This is where the submit timestamp is recorded.**
    - **Poll the folder where the output files from the jobs will be written.**
  - Stop CLIQ when all jobs are finished.

Experimental Results (UC5)



Experimental Results (UC5) contd

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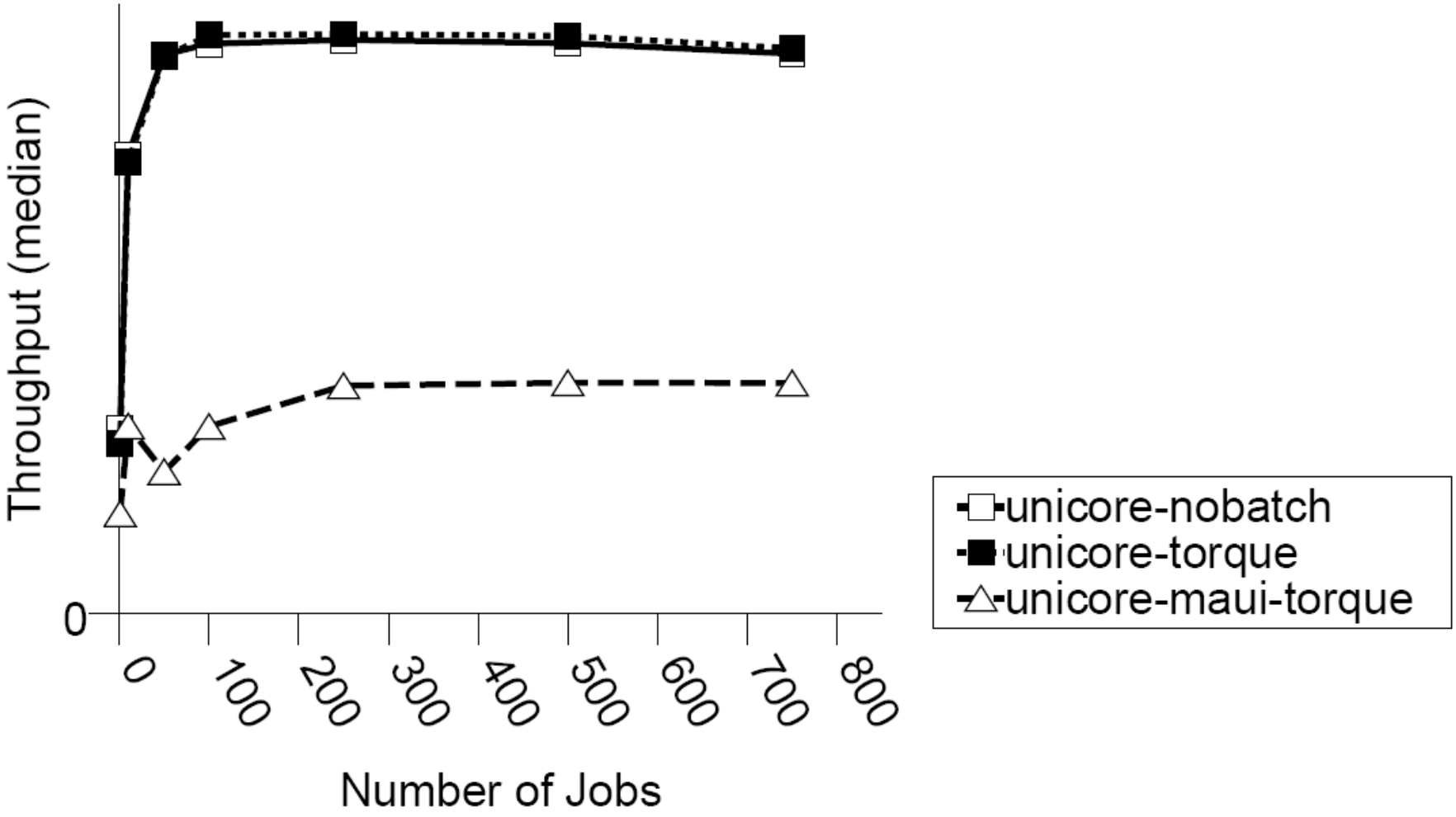
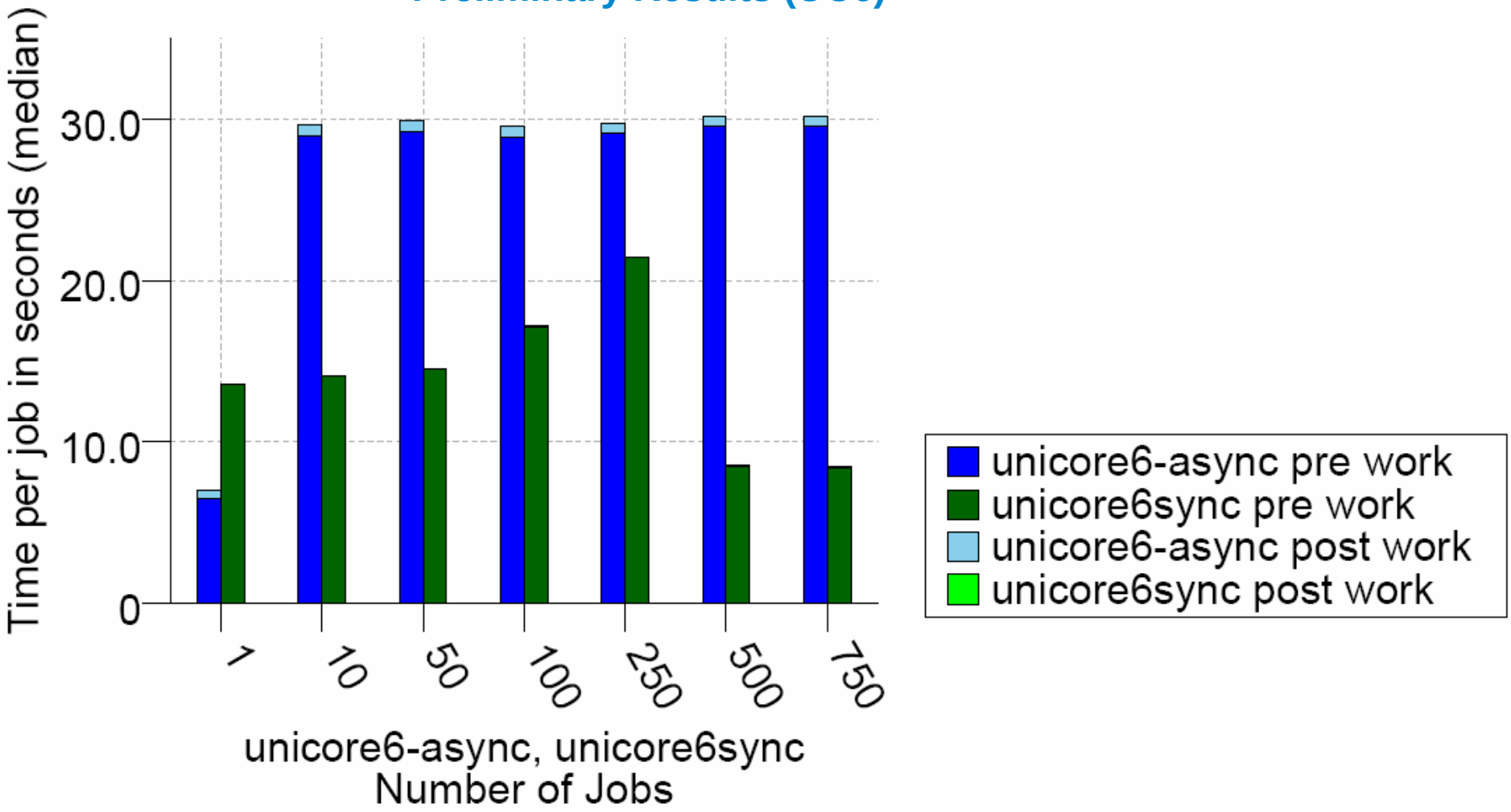
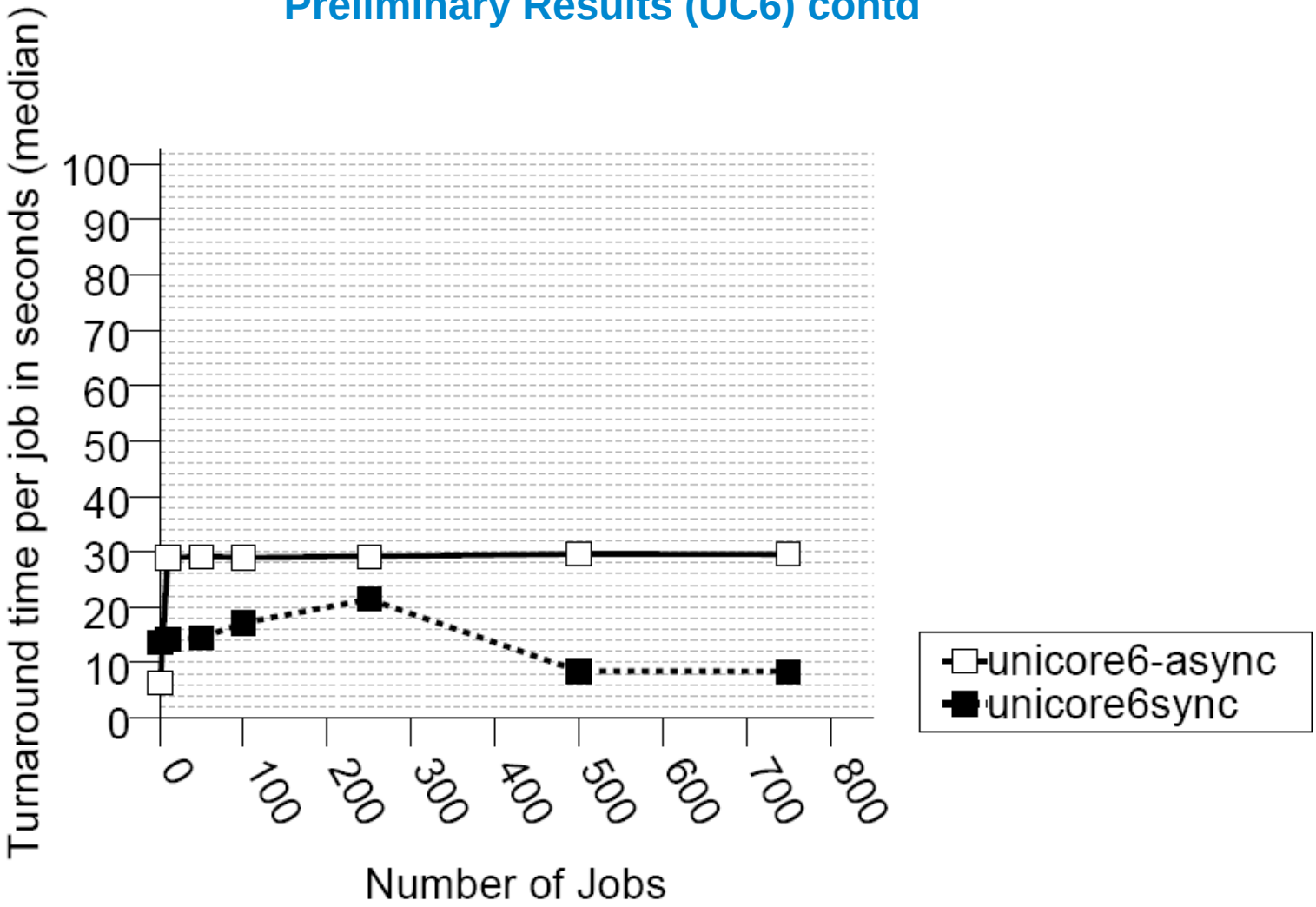


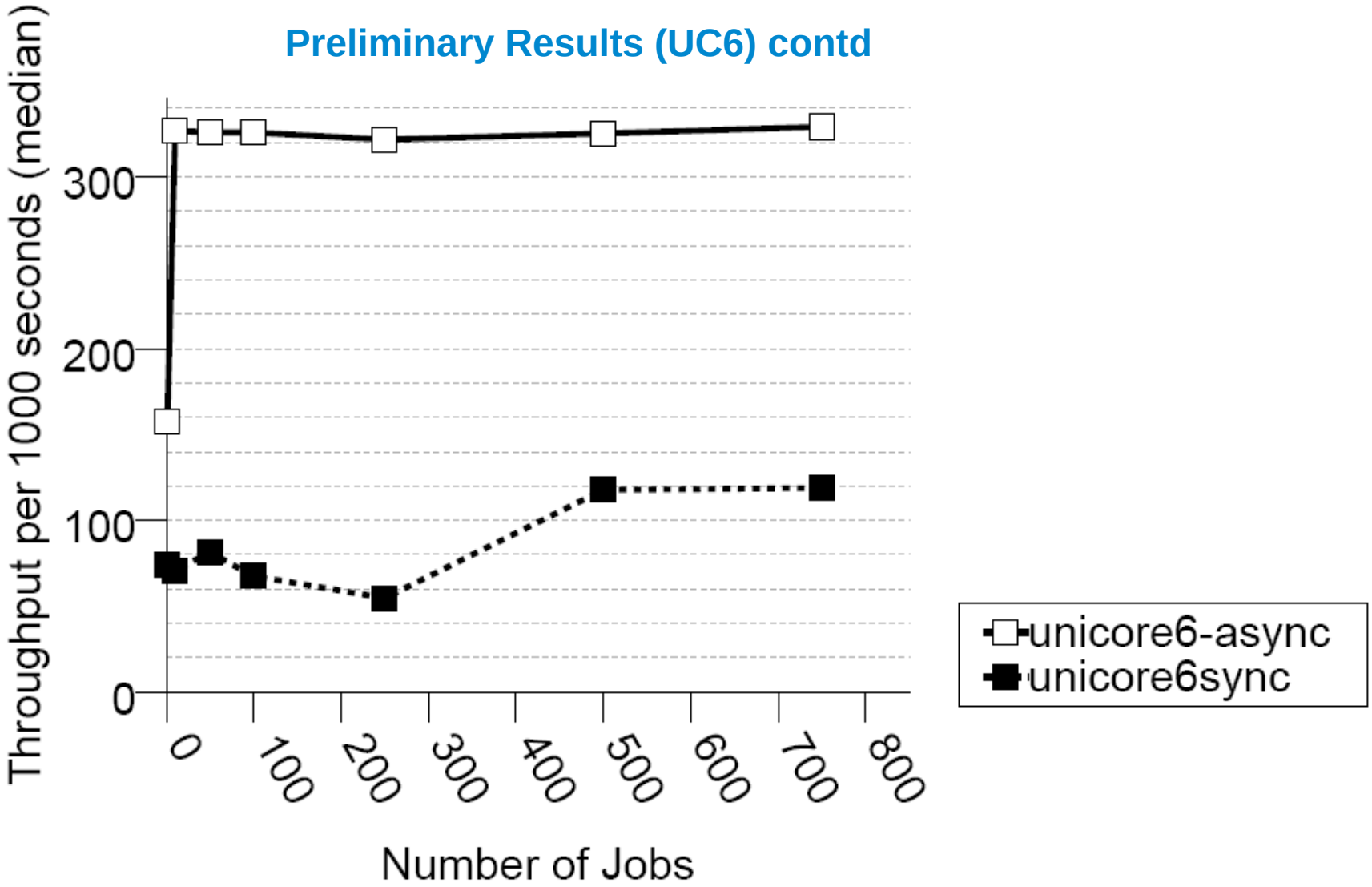
Preliminary Results (UC6)



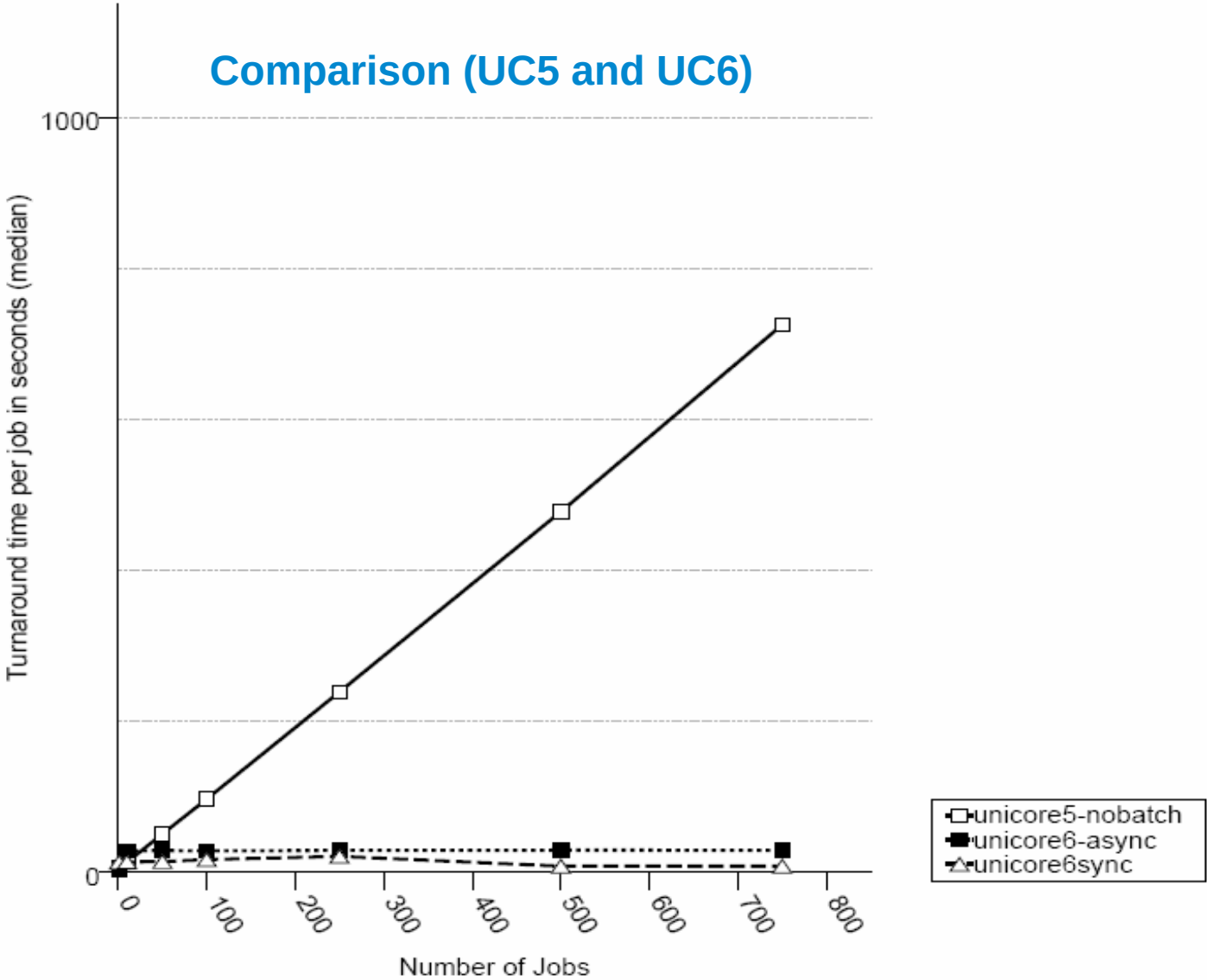
Preliminary Results (UC6) contd



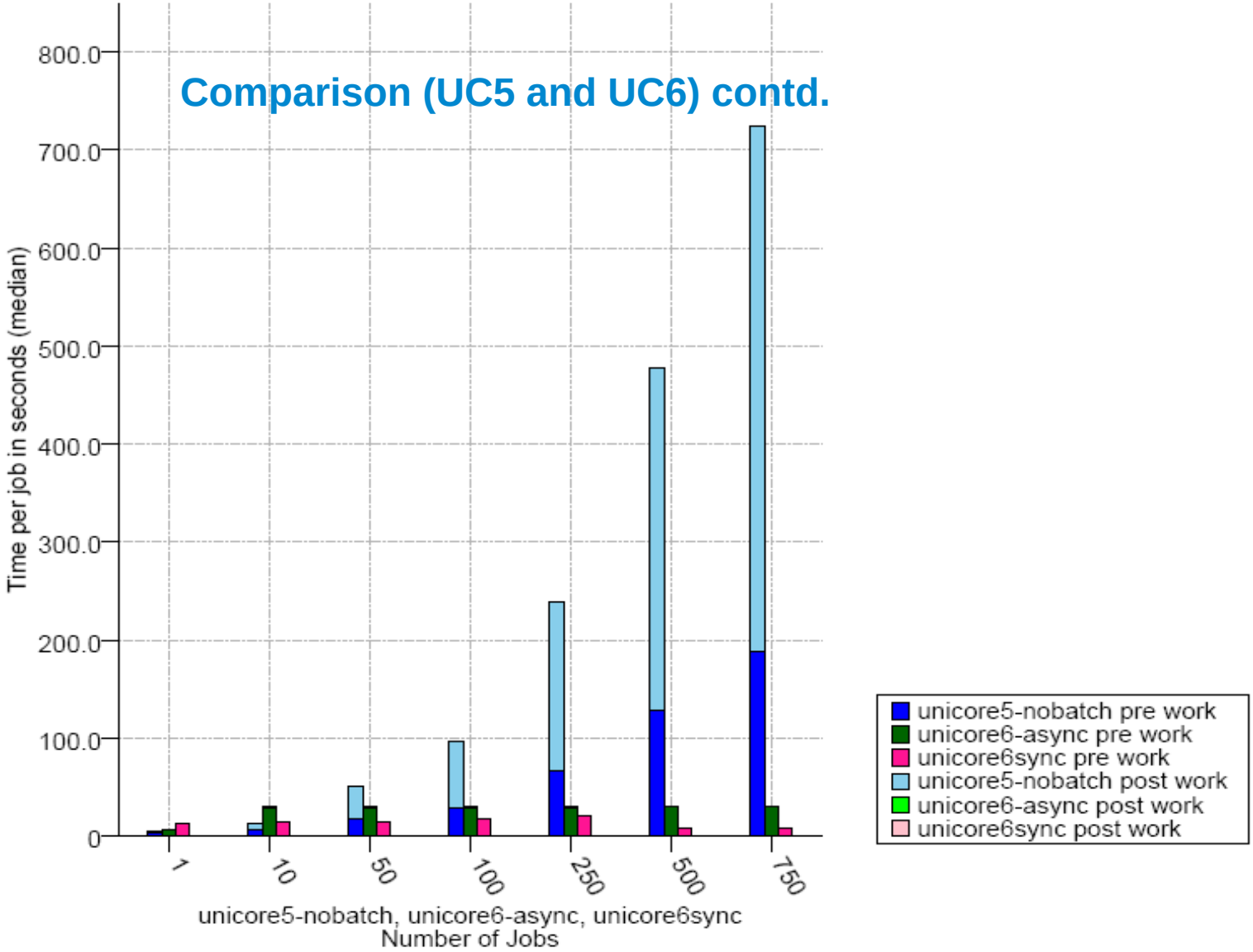
Preliminary Results (UC6) contd



Comparison (UC5 and UC6)



Comparison (UC5 and UC6) contd.



Next Step and Summary

- **A middleware independent benchmarking tool**
  - Loosely coupled, easily extendable
- **With sufficient effort: comparable and reproducible results, in principle fair**
- **Next steps**
  - More job types
  - Results from other Grid Mw
  - Instrumentation API to get more details