Data-Aware Service Choreographies through Transparent Data Exchange

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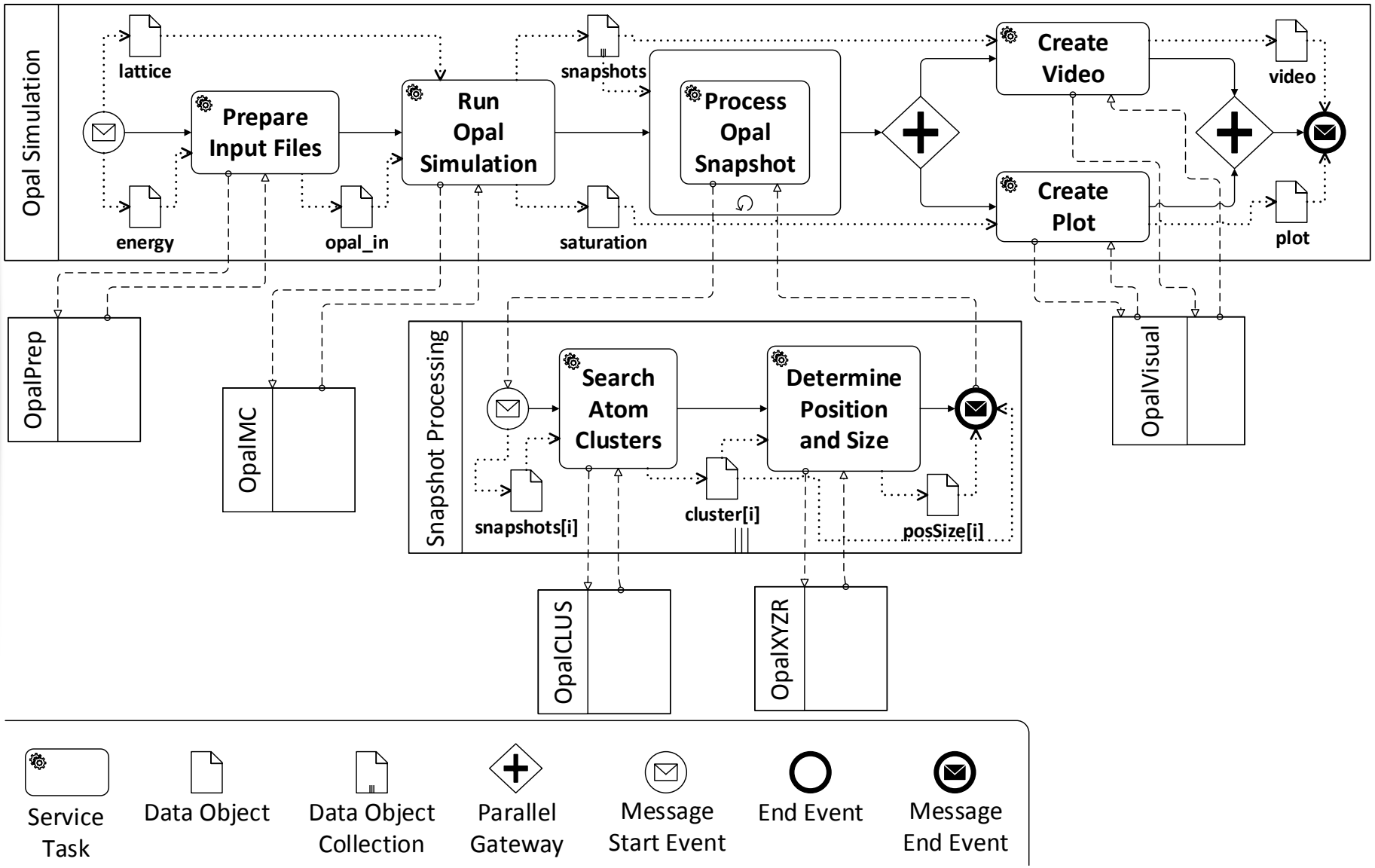
Motivation



[1] Binkele and Schmauder: An atomistic Monte Carlo simulation for precipitation in a binary system. In: International Journal for Materials Research, 94, pp. 1-6, 2003.
[2] Sonntag et al.: Using Services and Service Compositions to Enable the Distributed Execution of Legacy Simulation Applications. In: Proc. of ServiceWave'11.

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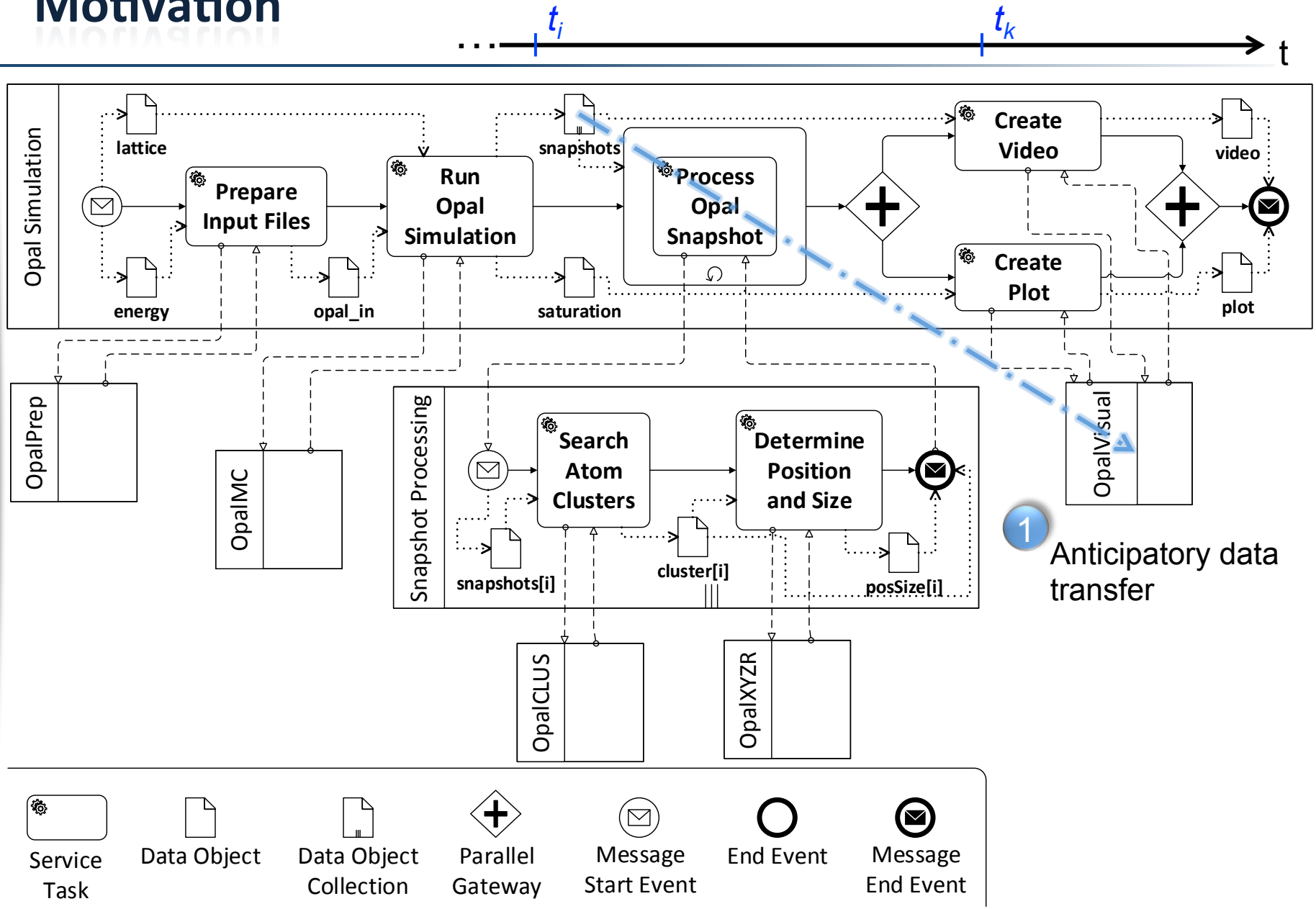

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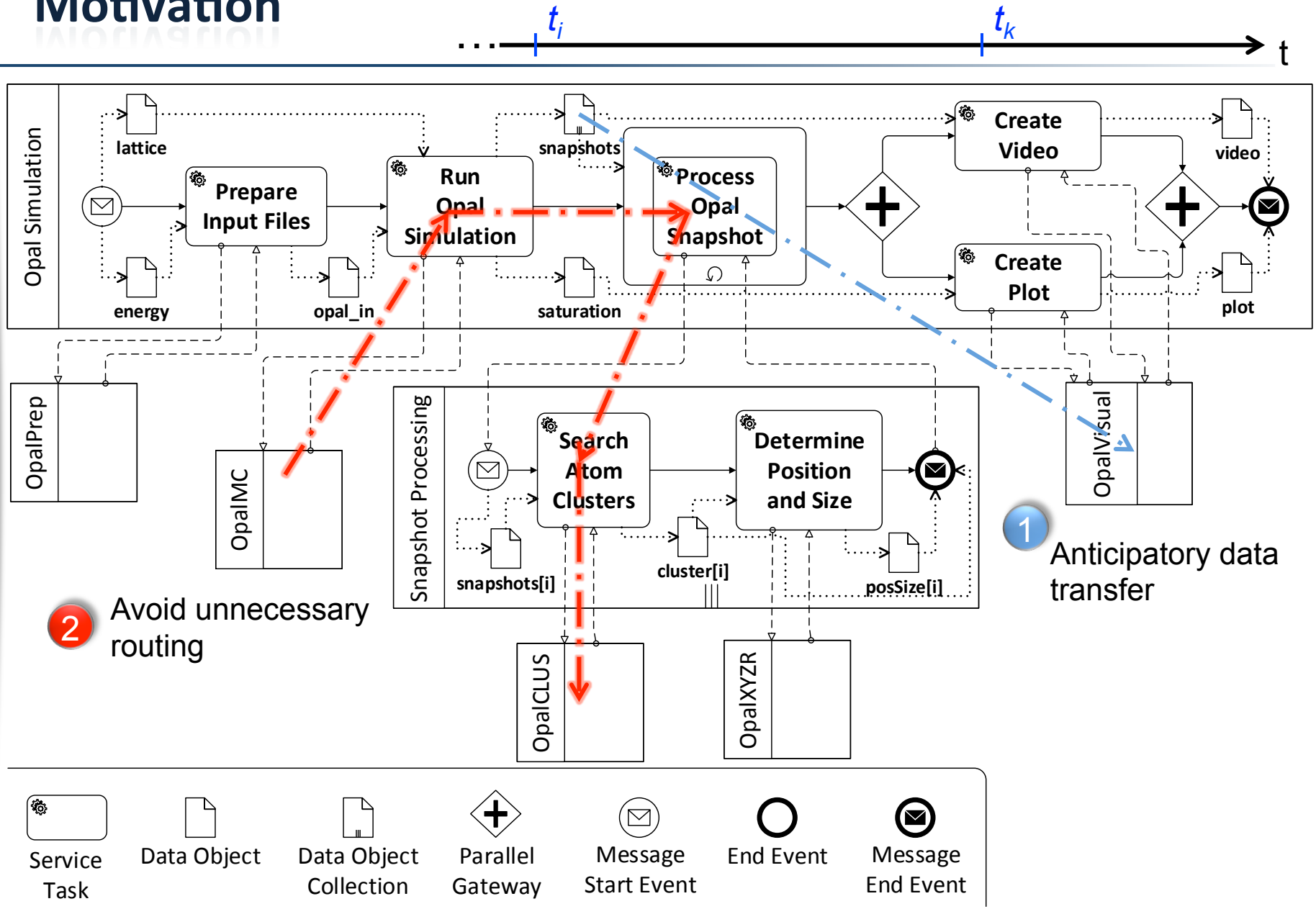

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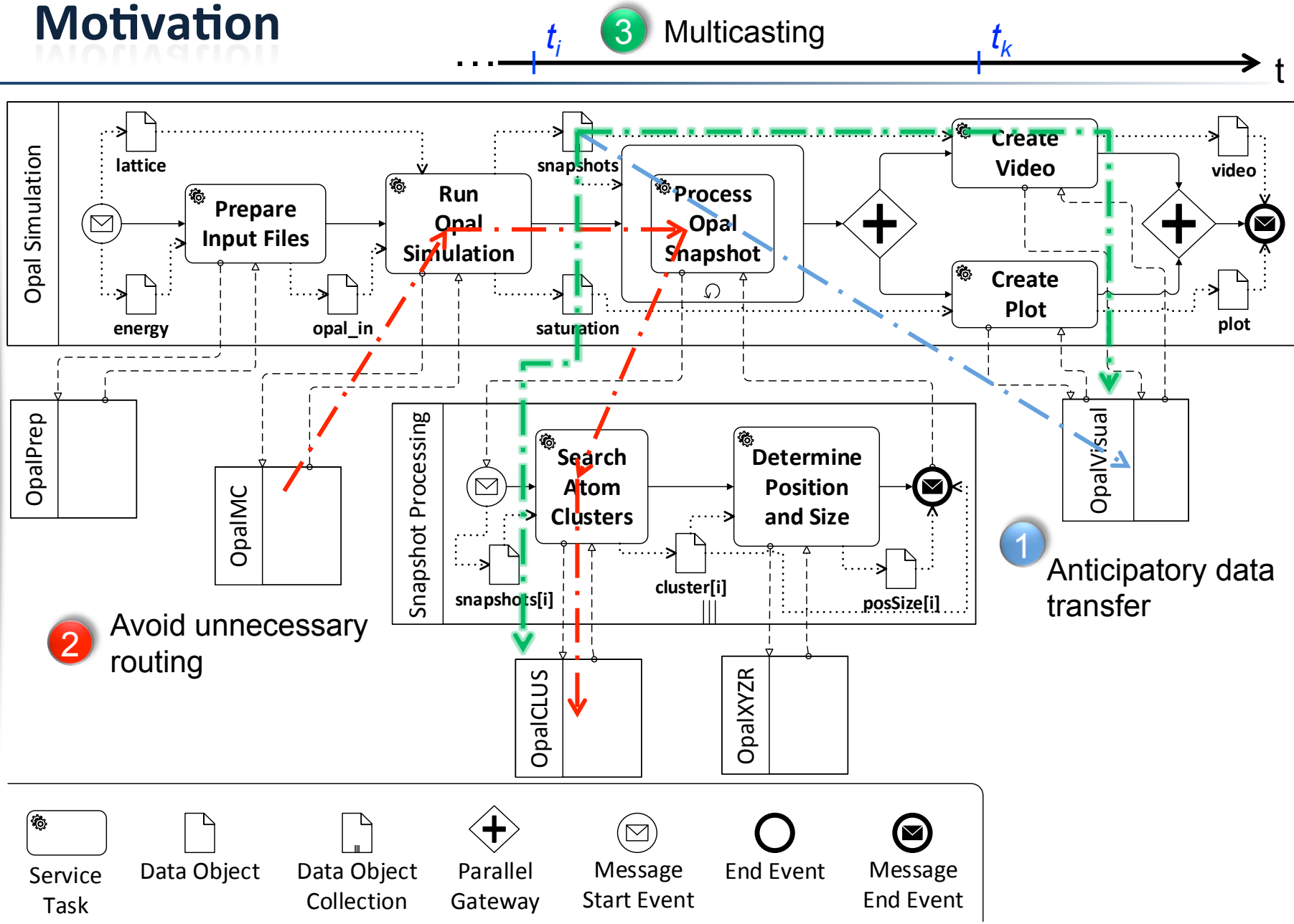

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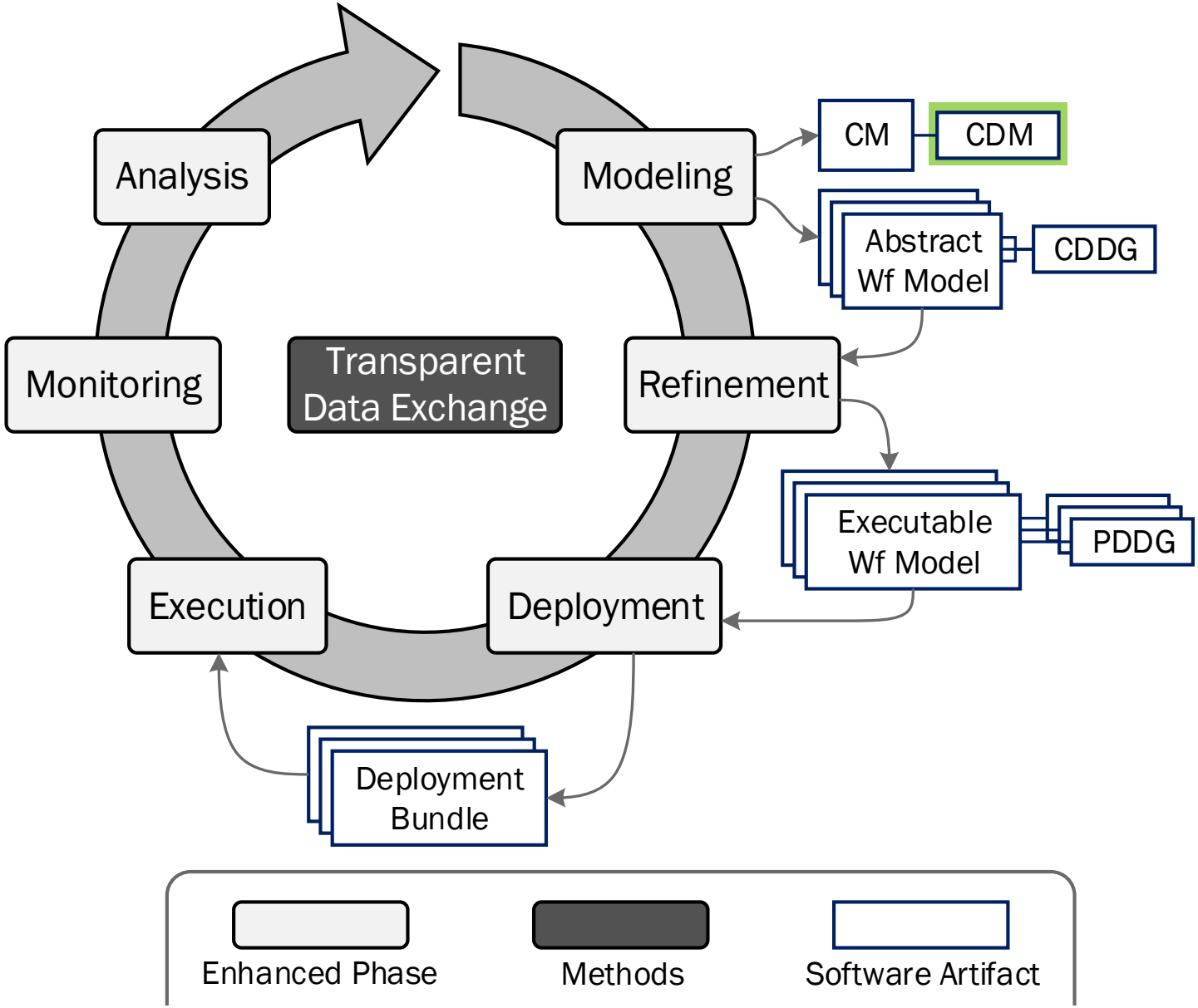
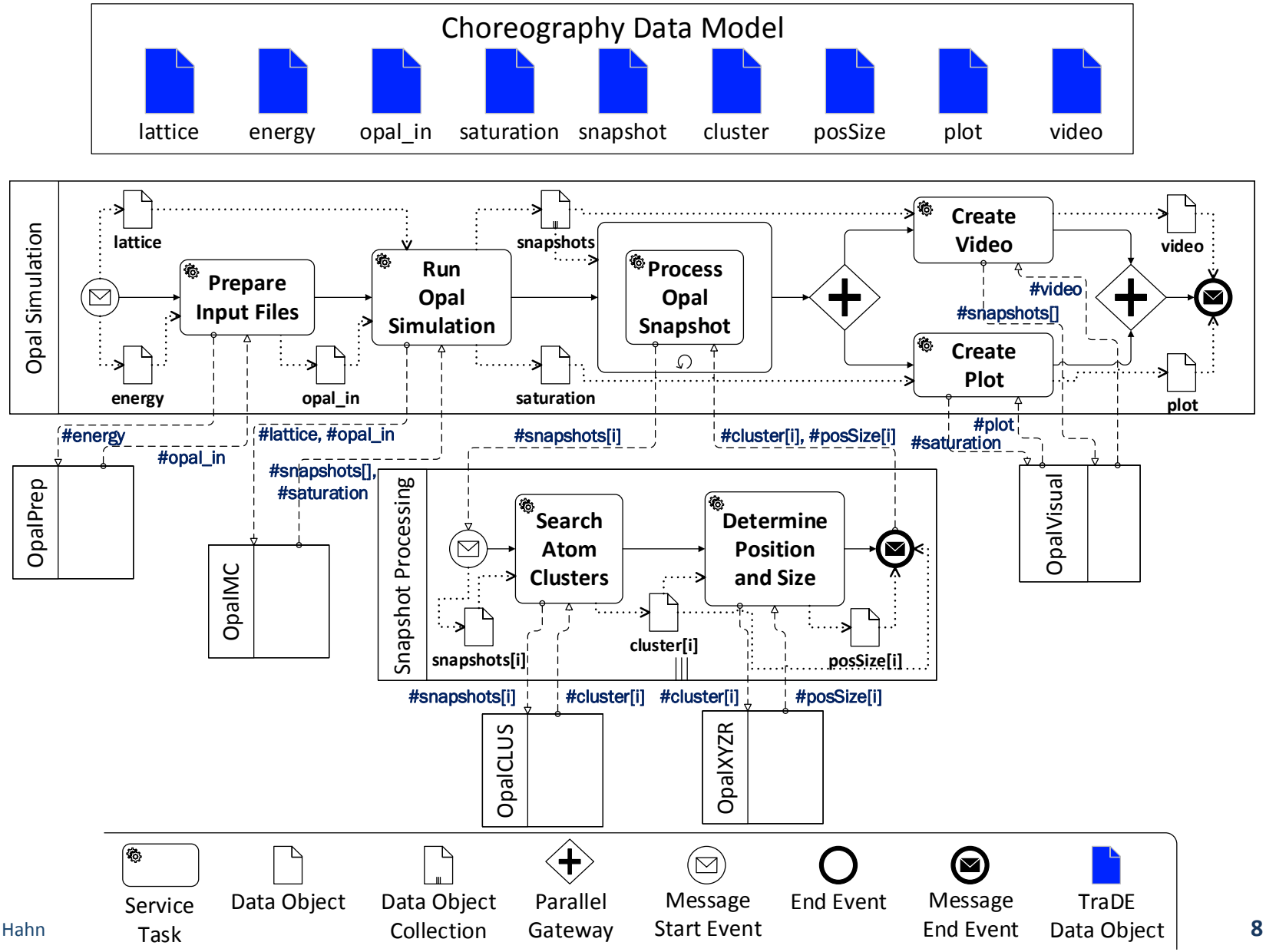
Outline

- Data-Aware Choreography Management Life Cycle
- Architecture
- Research Challenges
- Conclusions and Outlook

Data-Aware Choreography Management Life Cycle



Introducing a Choreography Data Model (CDM)



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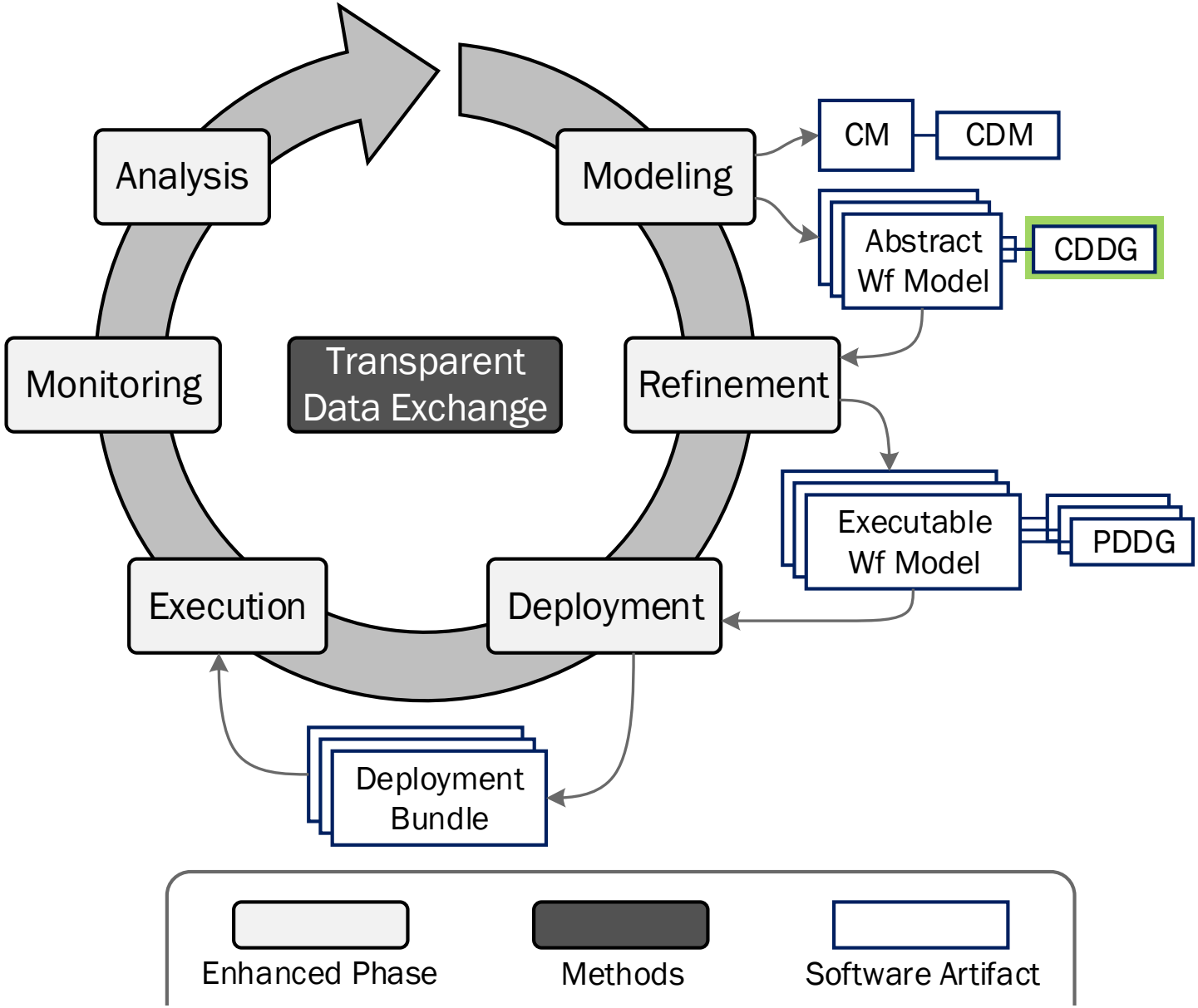
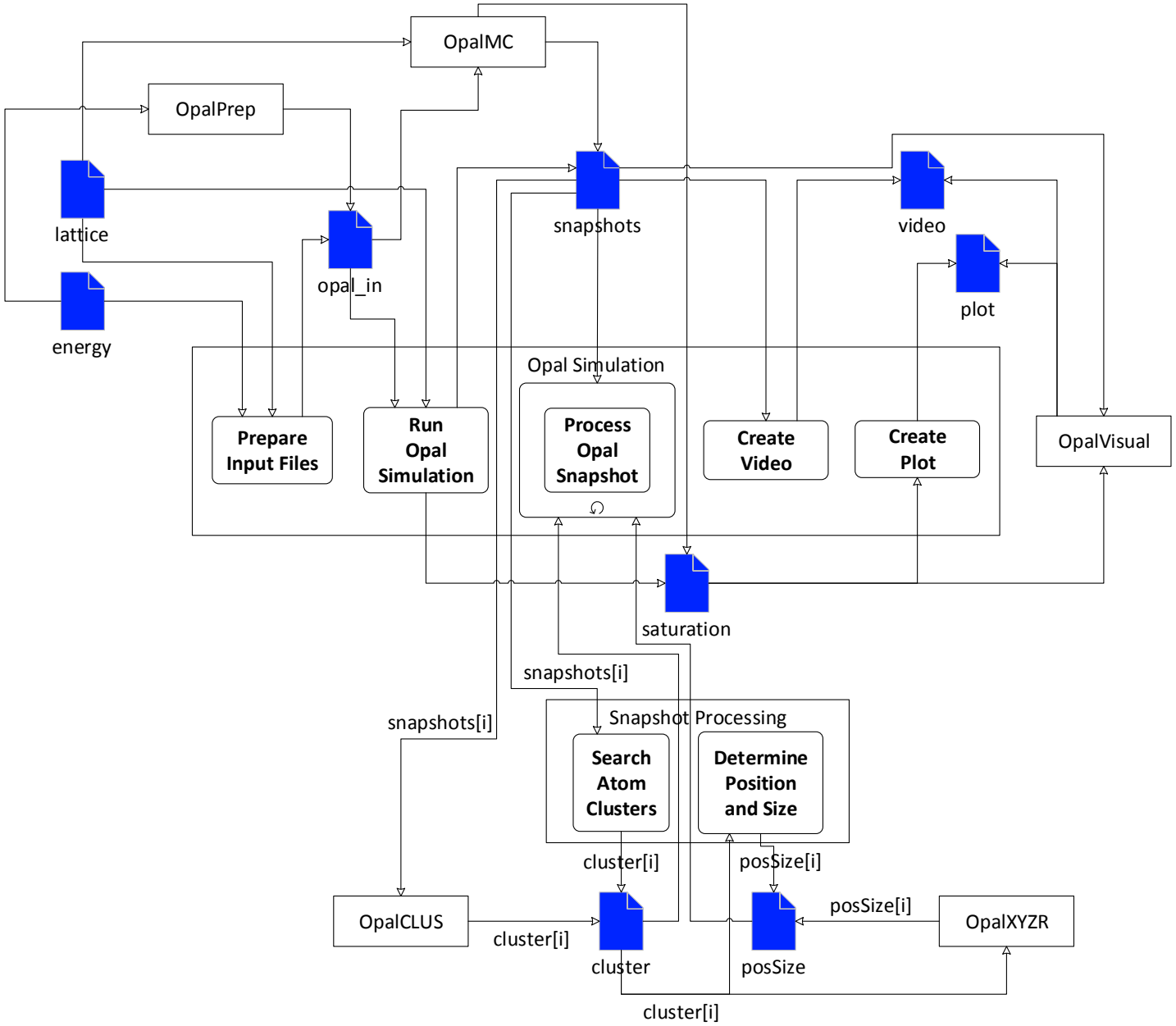


Data Dependencies between Participants (CDDG)



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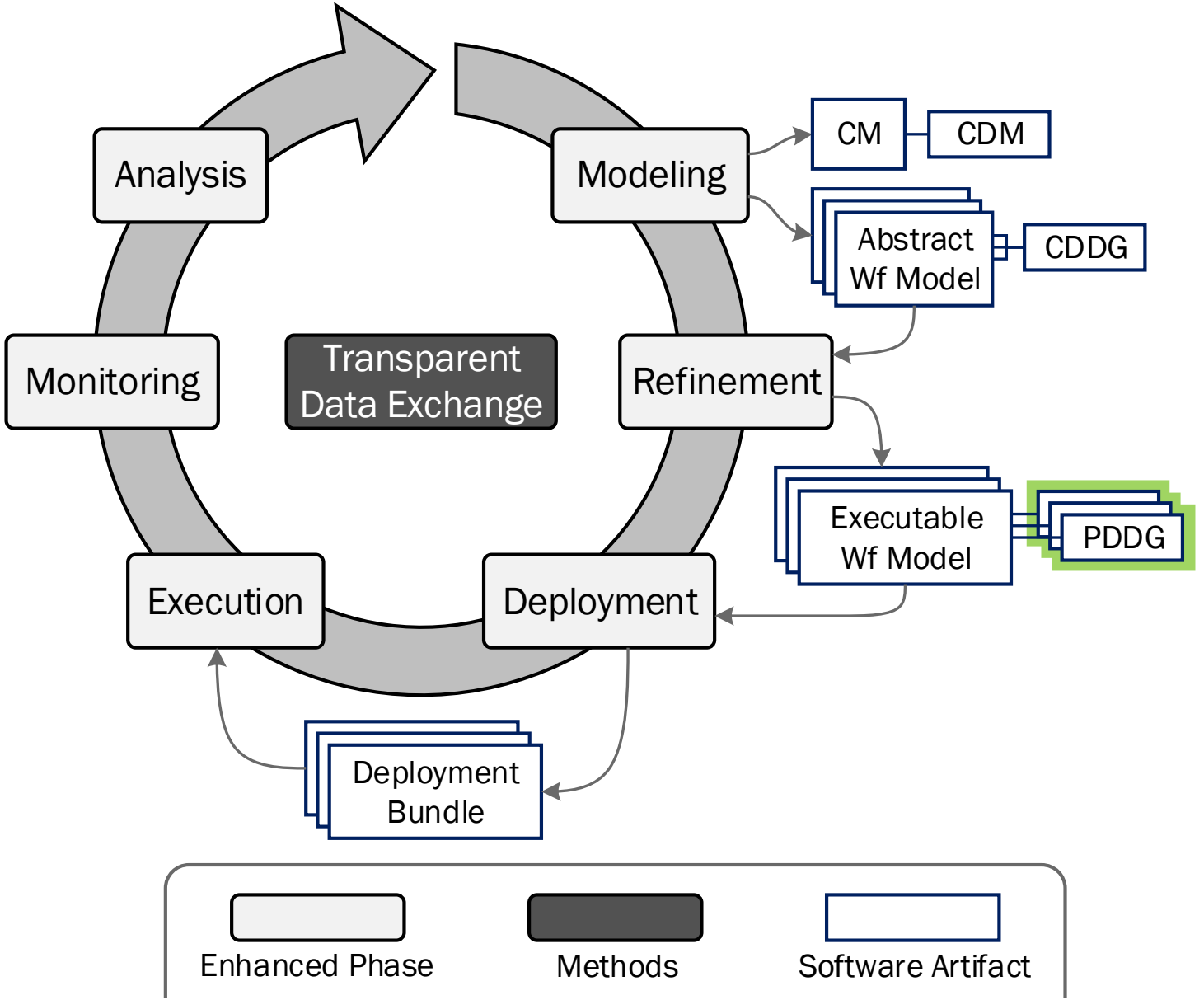
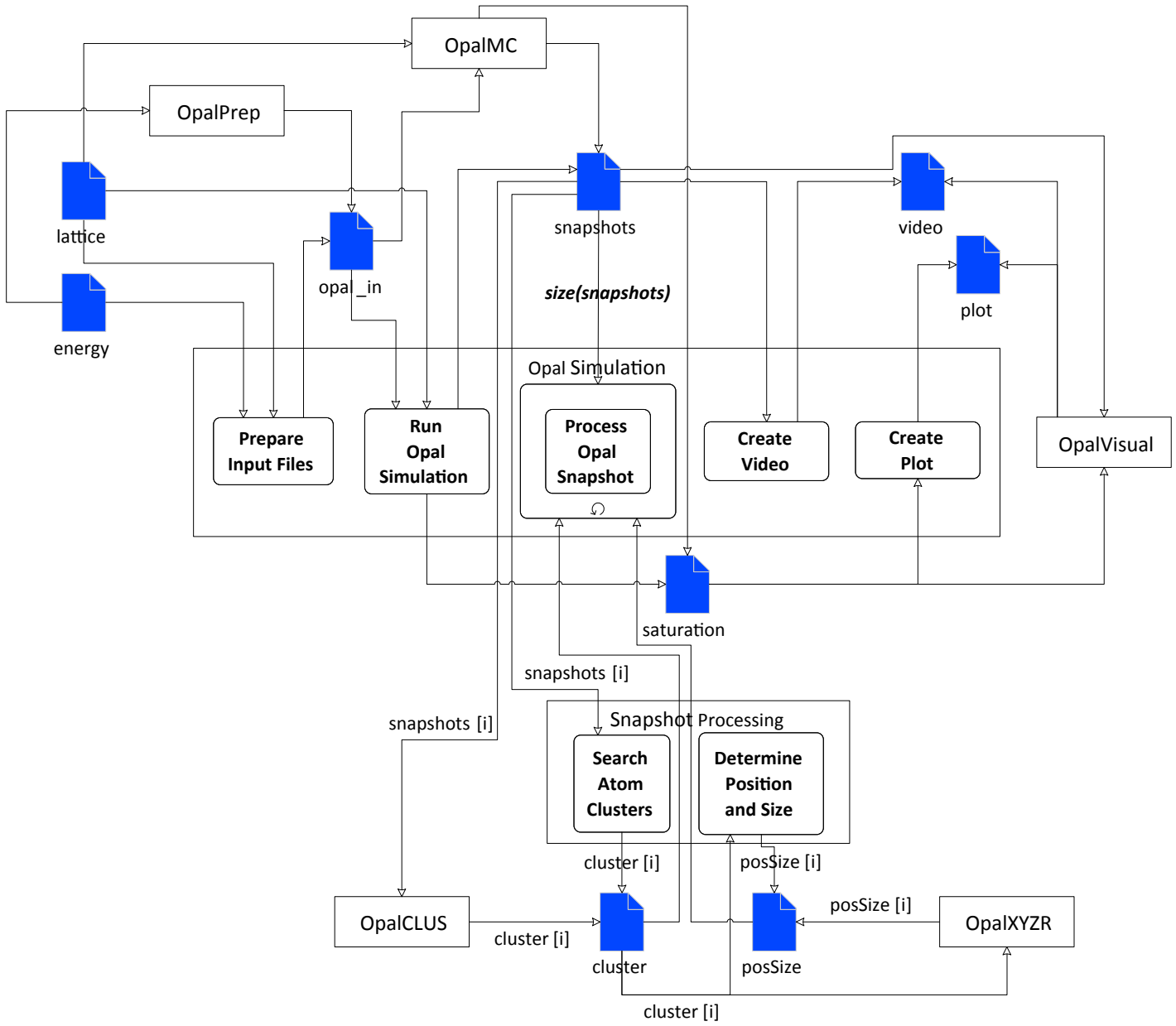


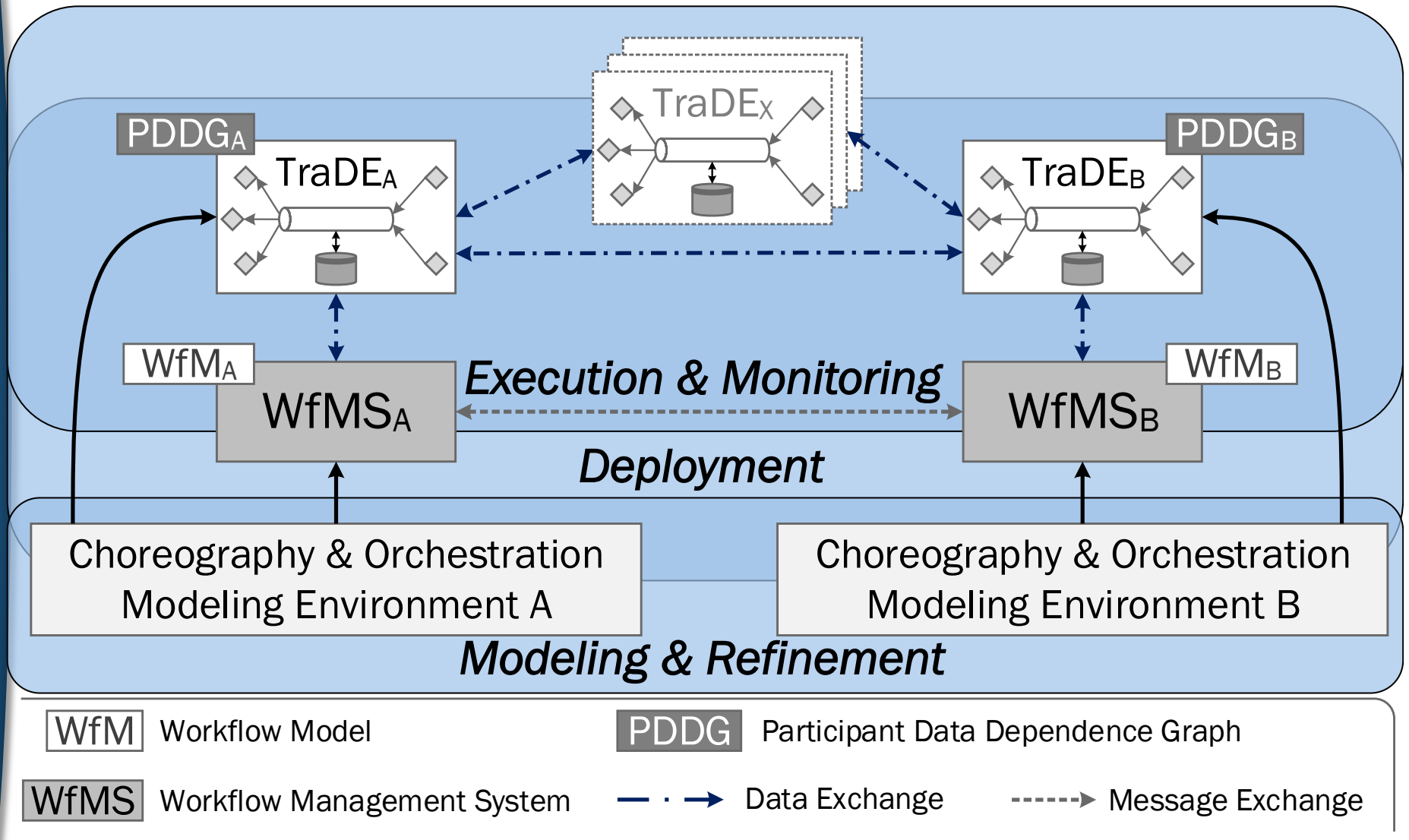
Participant Data Dependence Graph (PDDG)

- Analysis of internal data flow and data dependencies regarding the defined data objects in refined workflows
- Knowledge can be used as input for optimization during modeling time and run time
- PDDGs enable refinement of CDDG

Refined Choreography Data Dependence Graph (CDDG)



Architecture



Research Challenges

Data analysis and optimization algorithms based on introduced new artifacts, i.e., CDM, CDDG & PDDG

Incorporating new knowledge into model transformation process

Concept and implementation of a distributed TraDE middleware

- Communication protocols for fault-tolerant, secure and reliable asynchronous data exchange
- Integration with SOA middleware (ESB, WfMS) and services
- Data correlation and monitoring

Definition of optimization strategies for, e.g., data staging, placement and exchange during run time

IAAS Research

Conclusions and Outlook

- Data-aware service choreography management life cycle with TraDE methods for data flow analysis and optimization
- System architecture that implements the life cycle
- Research challenges represent our road map for future work

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