

Grid Scheduling Architecture RG

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Agenda



- Session #1 and #2
 - Progress of the research group
 - Talks
 - “Grid capacity planning with negotiation-based advance reservation for optimized QoS” (Radu Prodan)
 - ...
 - Scheduler interoperation
 - Scenario
 - JSDL profile
 - Scheduling parameters/JSDL micro-specification
 - Open issues & discussion

Milestones



- Short term
 - Scheduler interoperation feasibility study
 - Practical show-case
 - Within 12 months from now (as of OGF 19)
- Long term
 - Definition of a generic Grid scheduling architecture

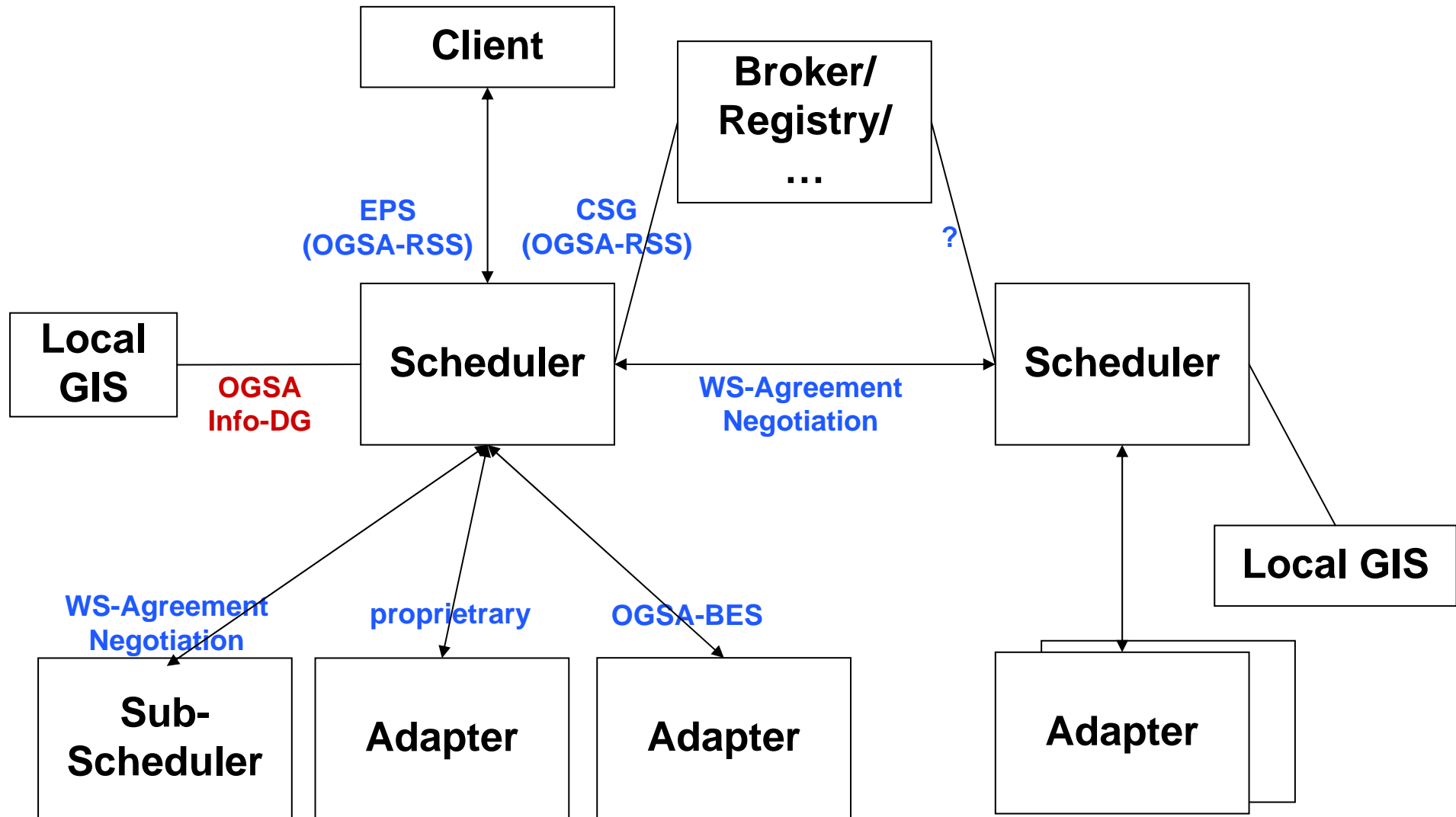
Progress of the Research Group

- Between OGF 19 and OGF 20

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Scheduler interoperation

Scenario

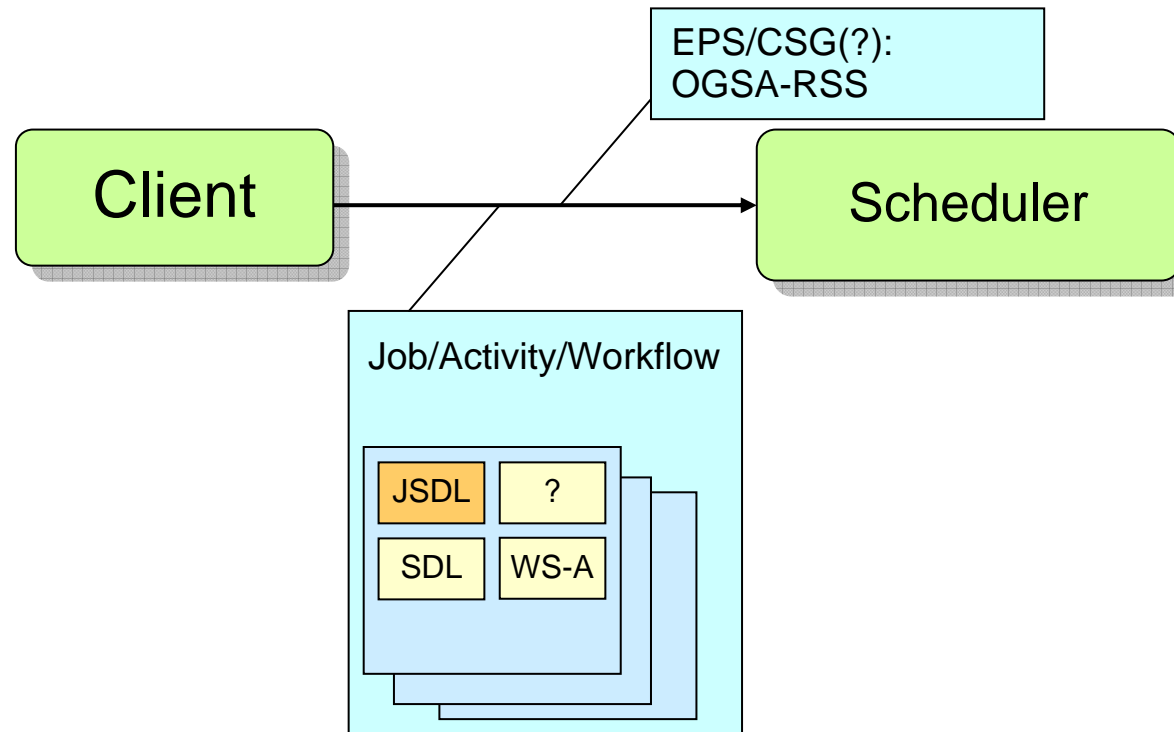


Place GSA in the landscape



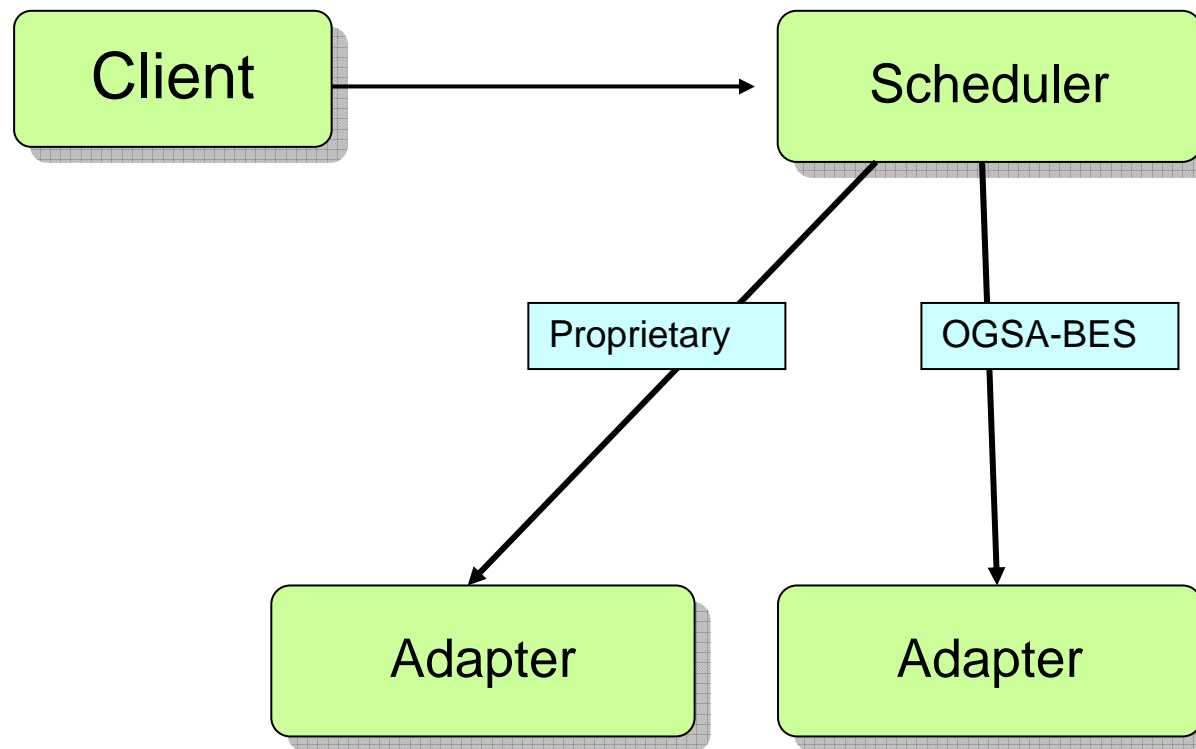
- Continue work on “Global Picture”
 - Interaction of entities
 - Use of existing services, standards, drafts, WGs
- Dive a level deeper from 50tsd ft.
- **First simple usage scenario:**
 - Link existing Grid schedulers to sensibly forward a computational jobs to another Grid scheduler for execution
 - Extend later; e.g. workflow/co-allocation/orchestration, other resources/jobs/services

Example Process including Scheduling and Execution



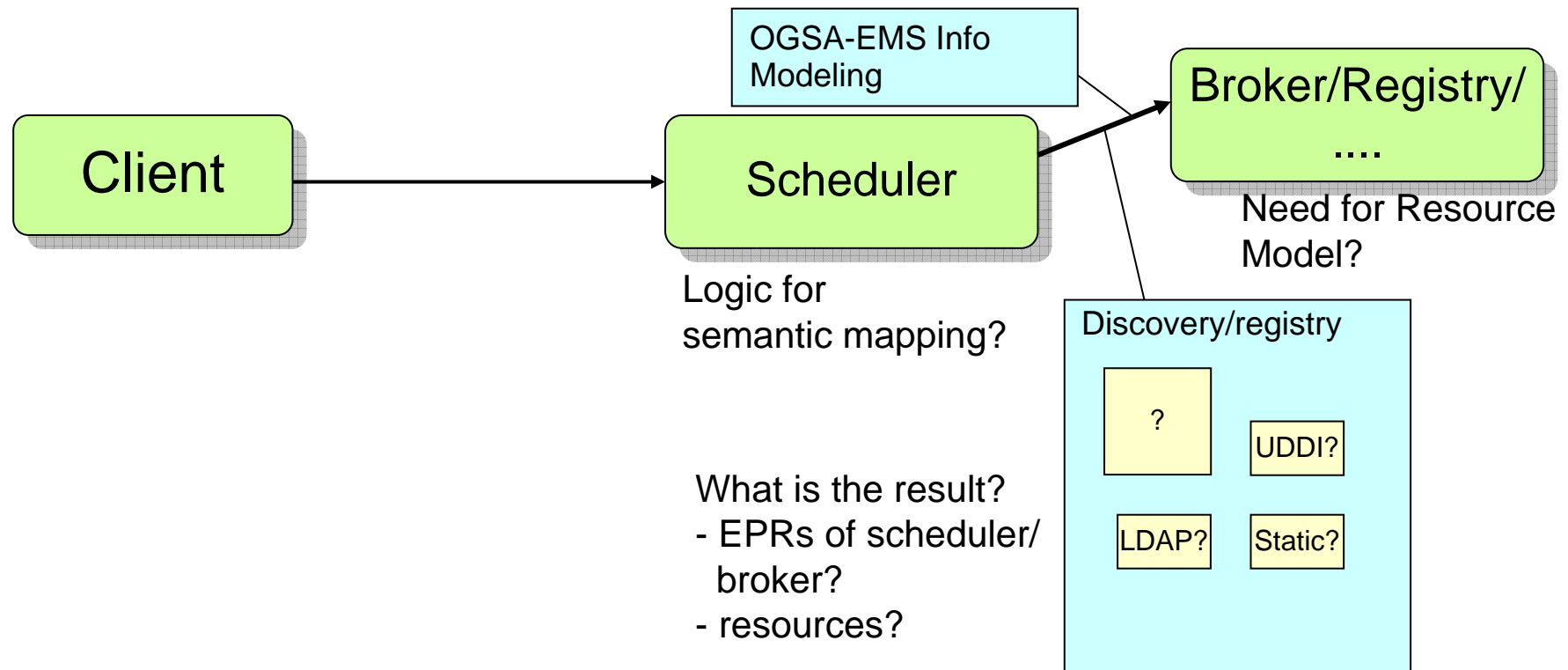
Activity/job/workflow needs to be submitted

Example Process including Scheduling and Execution (cont.)



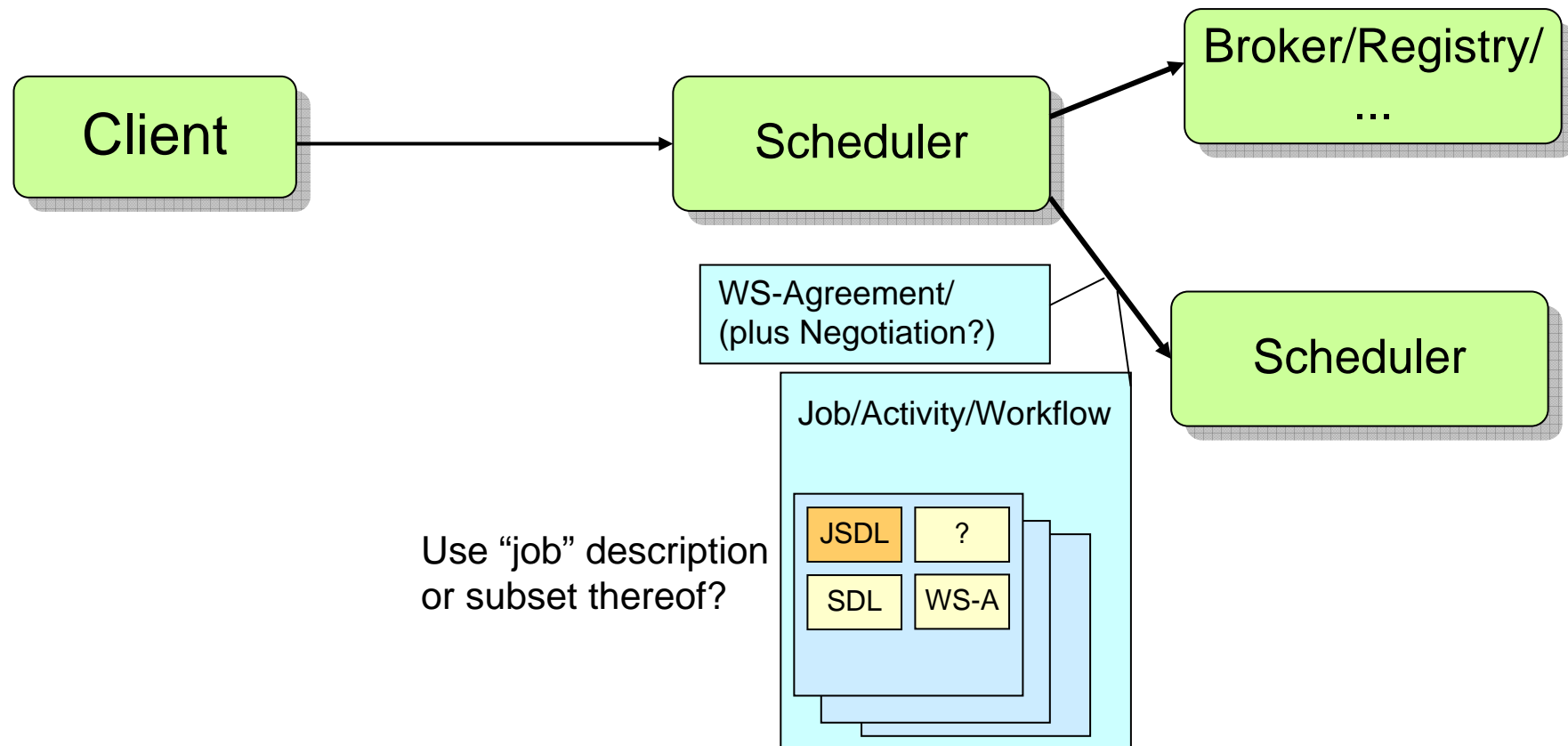
Direct access to resources through BES or some other protocol

Example Process including Scheduling and Execution (cont.)



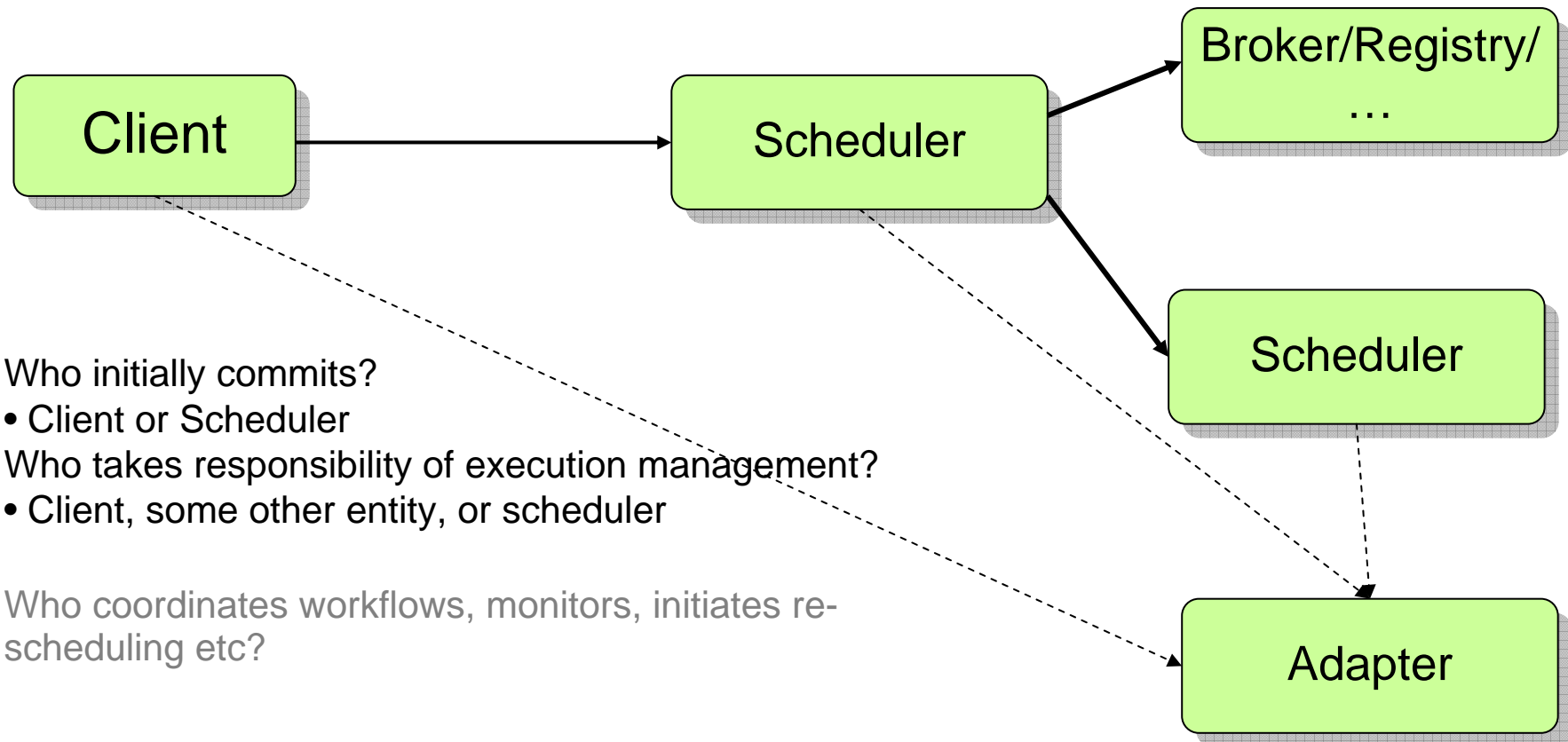
- Access resources through another broker/scheduler
- Identify available other scheduler/brokers through registry, statically, somehow?

Example Process including Scheduling and Execution (cont.)



- Access resources through another broker/scheduler
- Communicate with remote scheduler about potential agreement

Example Process including Scheduling and Execution (cont.)



Transition to execution management?

Feasibility study

Goal & Interactions



- Simple use case: Two schedulers interoperate with each other
- Goal: Show feasibility through implementation
- Concrete interactions to reach agreement on delegation of scheduling decision:
 1. Scheduler A cannot fulfil a scheduling request
 2. Request is passed to Scheduler B
 3. Scheduler B checks its capabilities
 4. Scheduler A & B agree/disagree on conditions to fulfil the request
 5. [Potentially it is possible to re-negotiate the conditions]
 6. Scheduler B fulfils the scheduling request

Candidate “standards”



“Standard” descriptions:

- Common job description: **JSDL**
- Common resource model: **OGSA Info model?**
 - OR semantic translation services between different models
- Add. scheduling parameters: **JSDL extensions?**

“Standard” protocols

- Agreement creation: **WS-Agreement**
- Negotiation: **WS-Negotiation?**

Participating projects



Confirmed

- Grid Resource Management System (GRMS)
- MetaScheduling Service (MSS)
- D-Grid

Interested

- GridWay
- ... your project?

Issues, questions, ...

Issues to discuss

- Is the current extension to WS-Agreement feasible?
- Schedulers remain autonomous. All information needed has to be passed via one scheduler interoperation interface. Do we cover all aspects
- There is no common information model shared between the schedulers. Solution?
-

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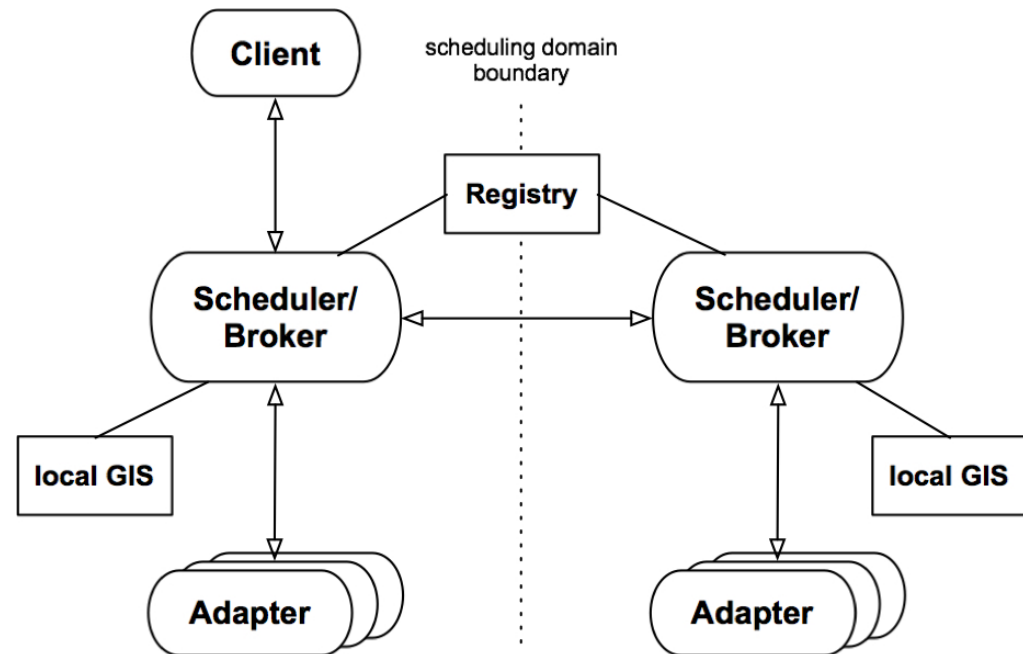
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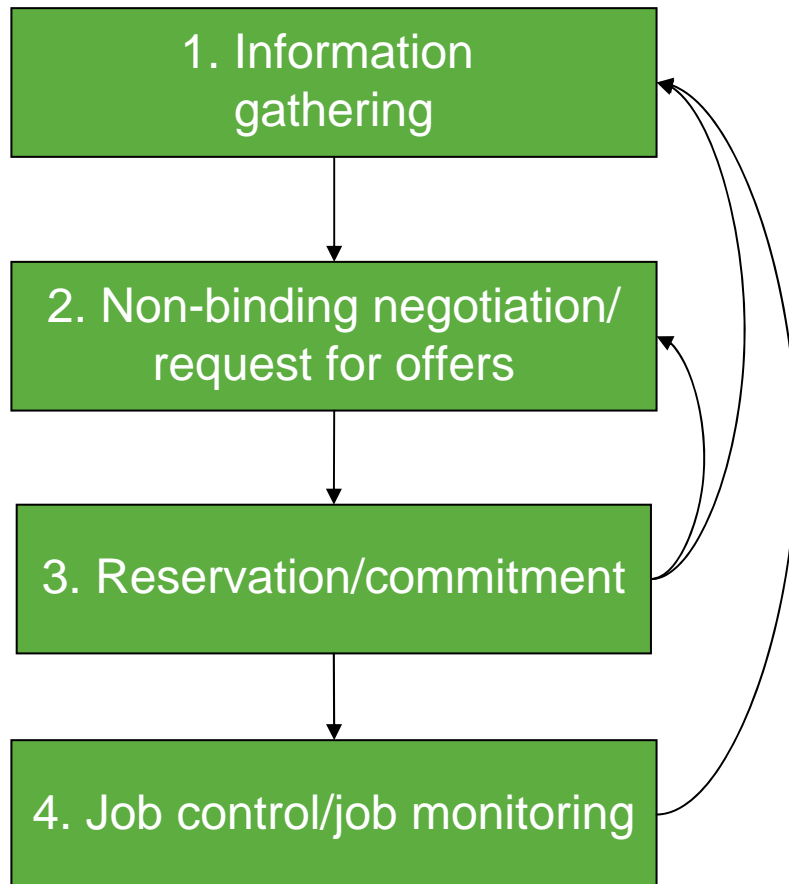
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Entities involved

- Main entities
 - Client
 - Scheduler
 - Adapter
- Utility entities
 - Registry
 - Local GIS (Grid Information Service)



Communication Stages



1. Information gathering about available remote Grid schedulers
2. Non-binding negotiation may end up with several possible agreement alternatives (possibly in parallel)
3. Agreement creation and commitment; may fail and require return to previous stages
4. Handing over job control to remote Grid scheduler (responsibility remains at initiator)