FROM RESEARCH TO INDUSTRY

Lustre-HSM

Progress report on Lustre HSM and proposal for a new design of the coordinator

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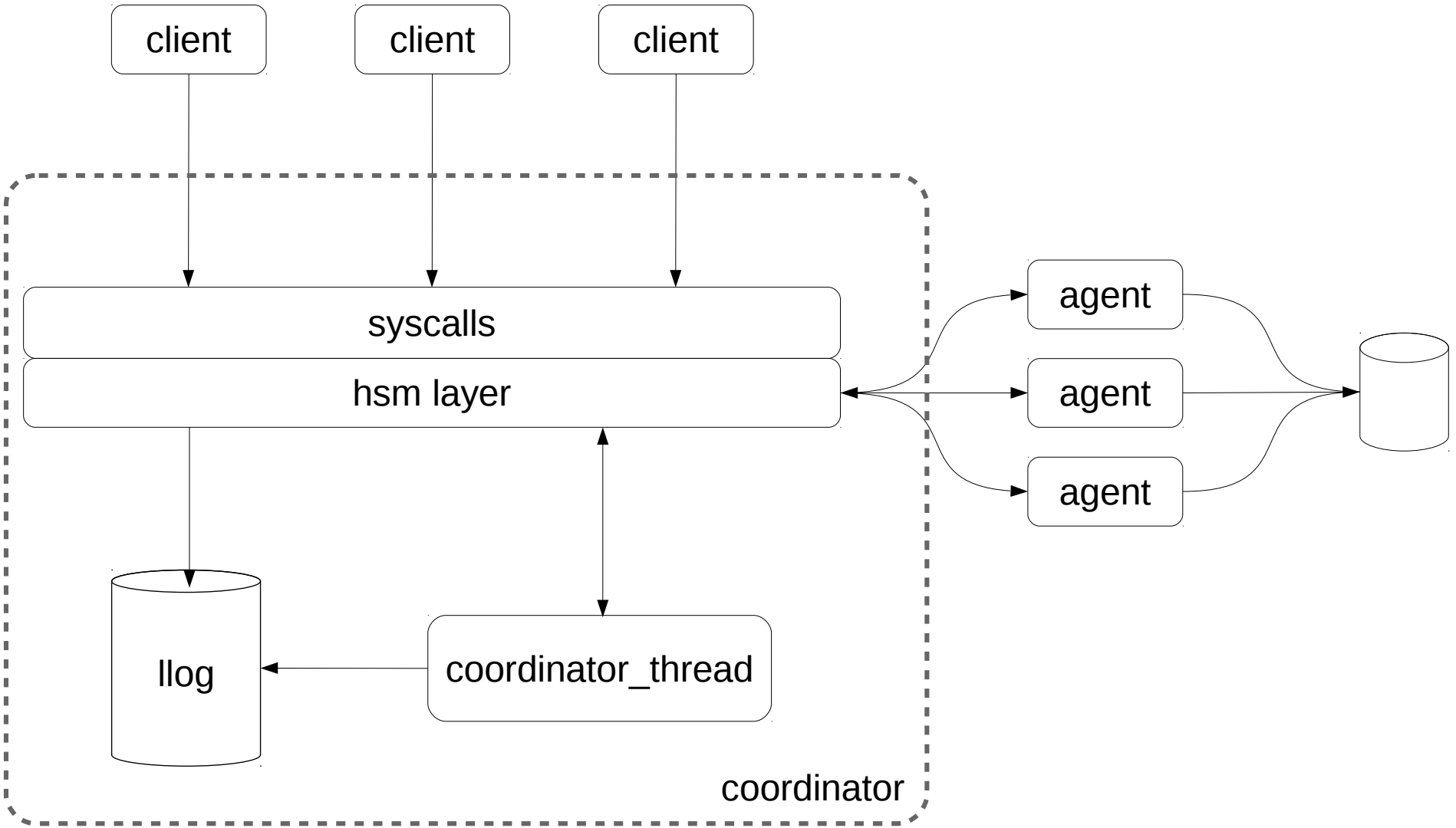
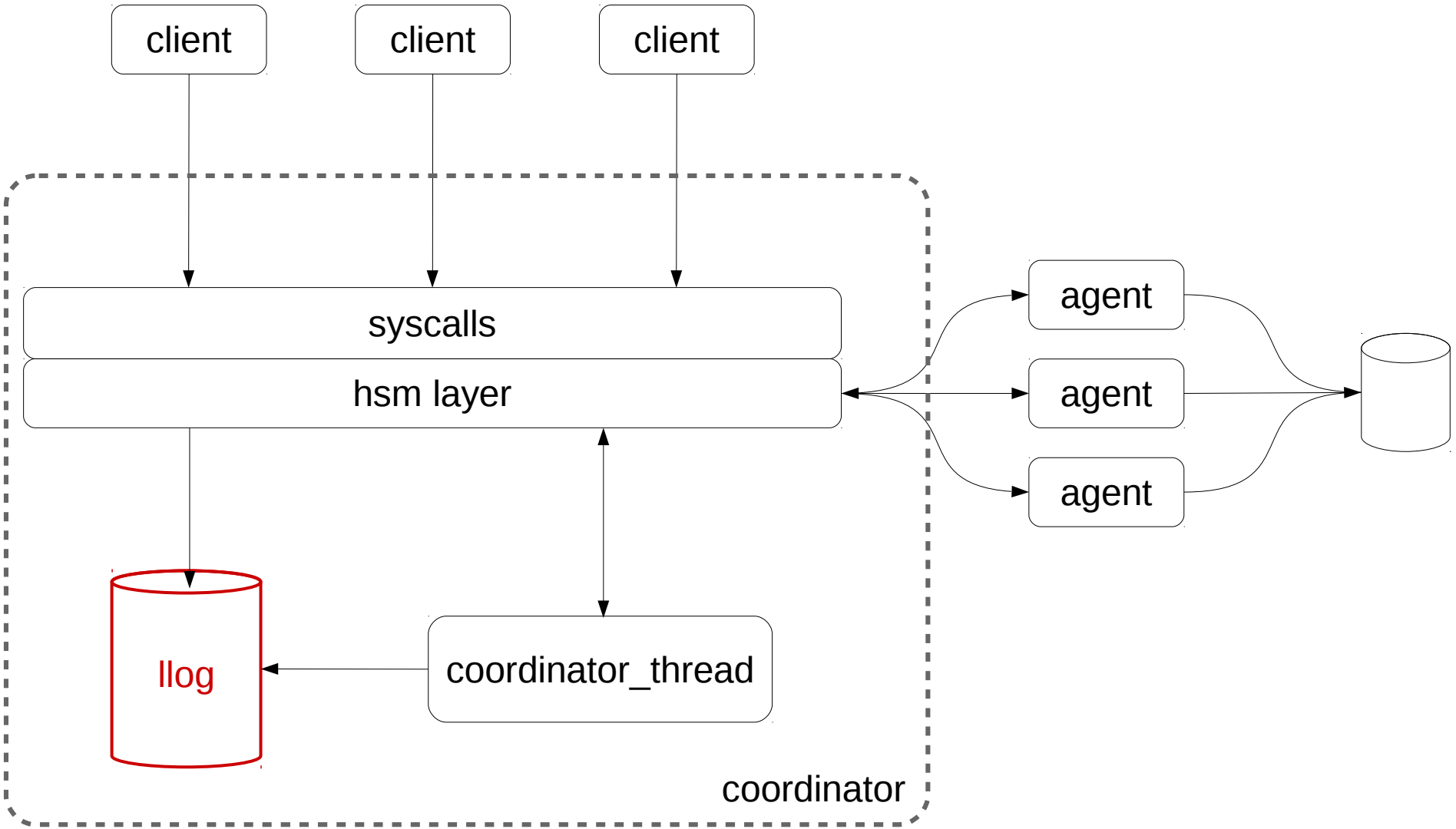
October 6, 2017

Quentin Bouget

Introduction: coordinator's design



Contended design



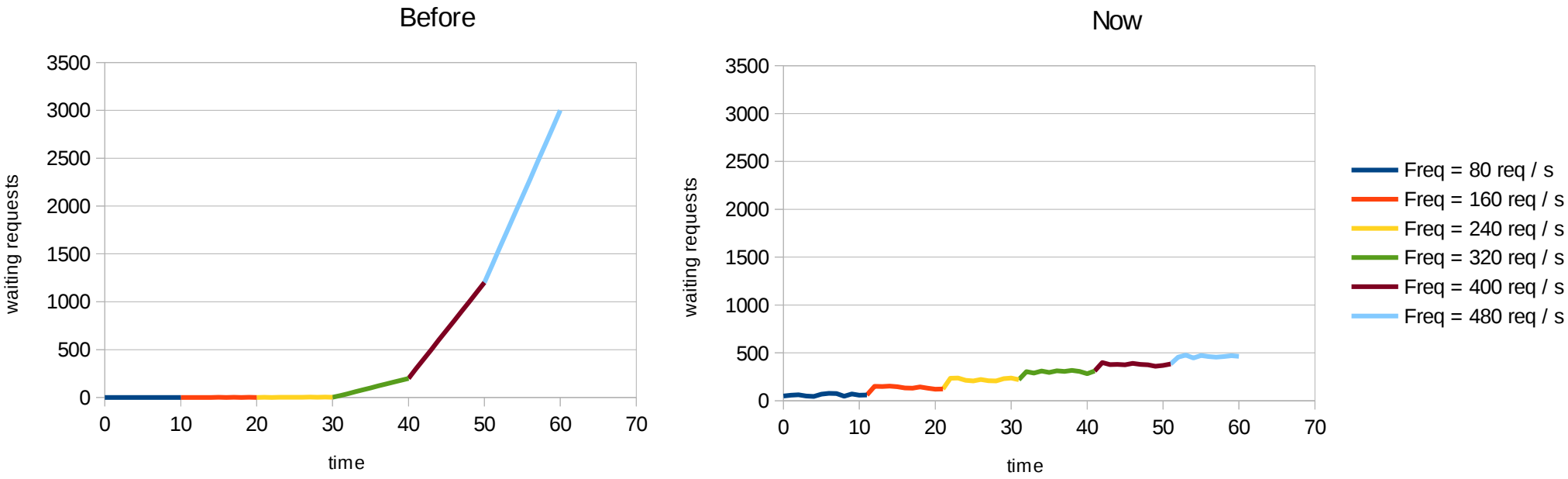
History (~6 months)

bugfix / **performance** / **feature**

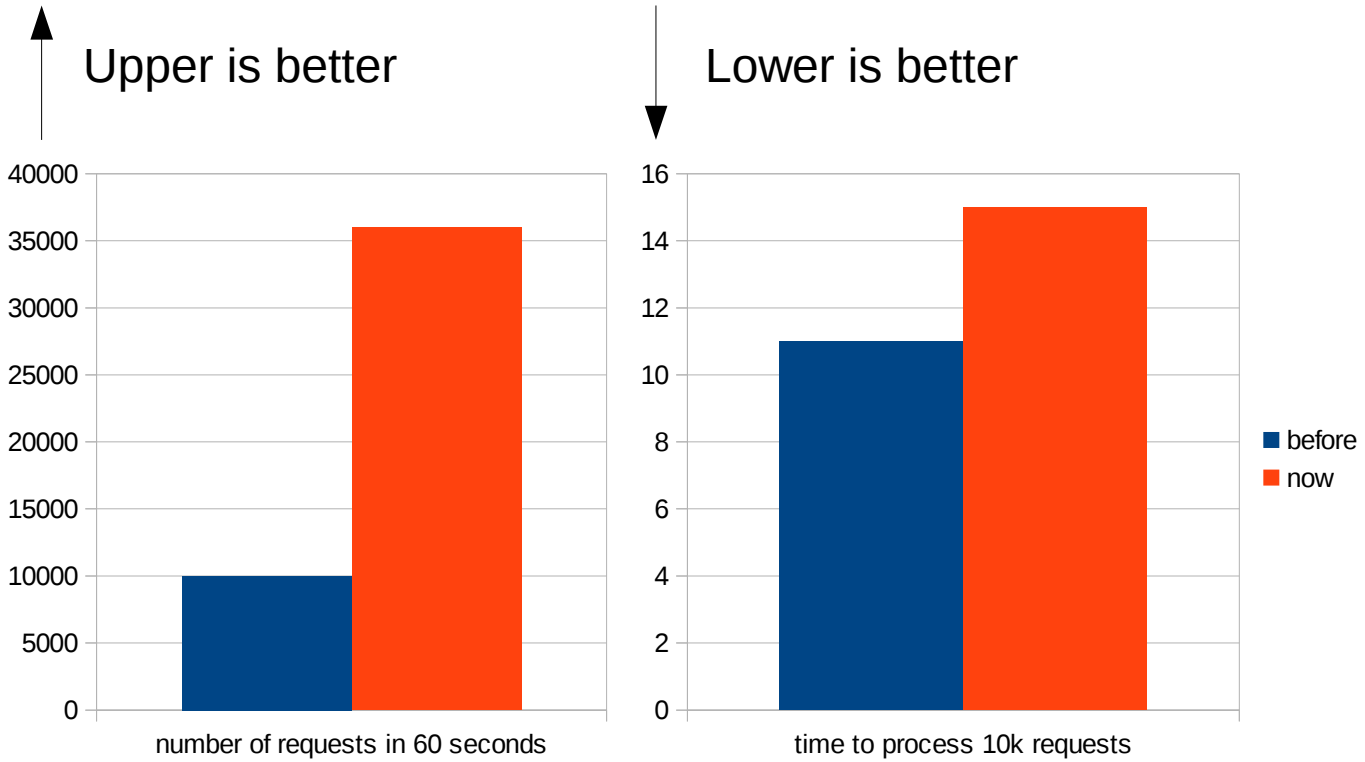
- **f3a4152** LU-7988 hsm: update many cookie status at once
- **afc9ff6** LU-7988 hsm: added coordinator housekeeping flag
- **cc6ef11** LU-7988 hsm: run HSM coordinator once per second at most
- **f11a502** LU-7988 hsm: mark the cdt as stopped when its thread exits
- **dd4b034** LU-4640 mdt: implement Remove Archive on Last Unlink policy
- **65effa6** LU-9338 hsm: cache agent record locations
- **2d5babe** LU-9312 hsm: convert cdt_llog_lock to a rw semaphore
- **958198e** LU-7988 hsm: change coordinator start/stop mechanisms

Performance improvements

Lower is better



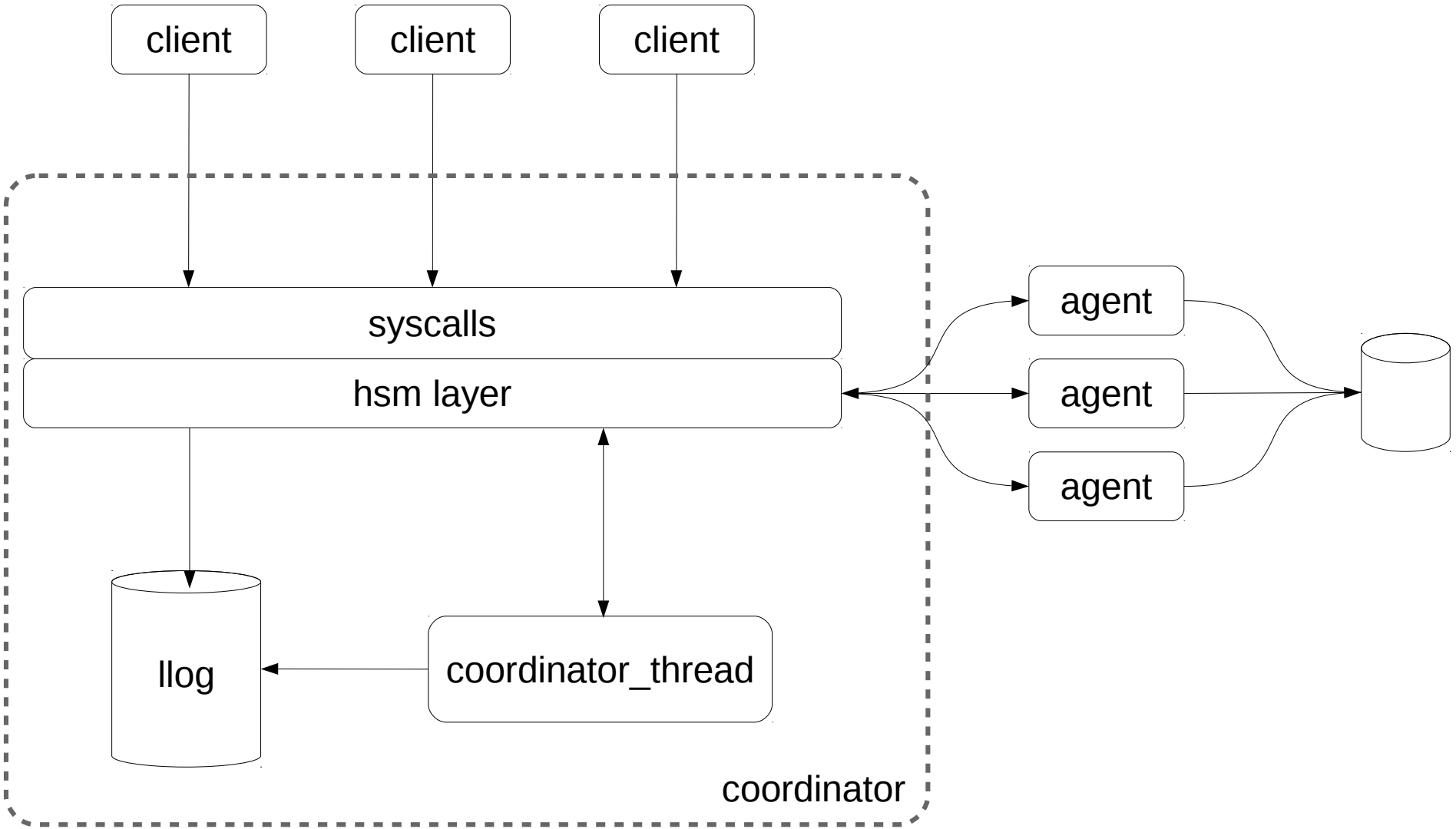
Performance improvements



Remaining issues

- Still not scalable (limited at 500 req/s)
- Current behaviour does not fit every workload
- Bugs: LU-5216, LU-5896

Current design



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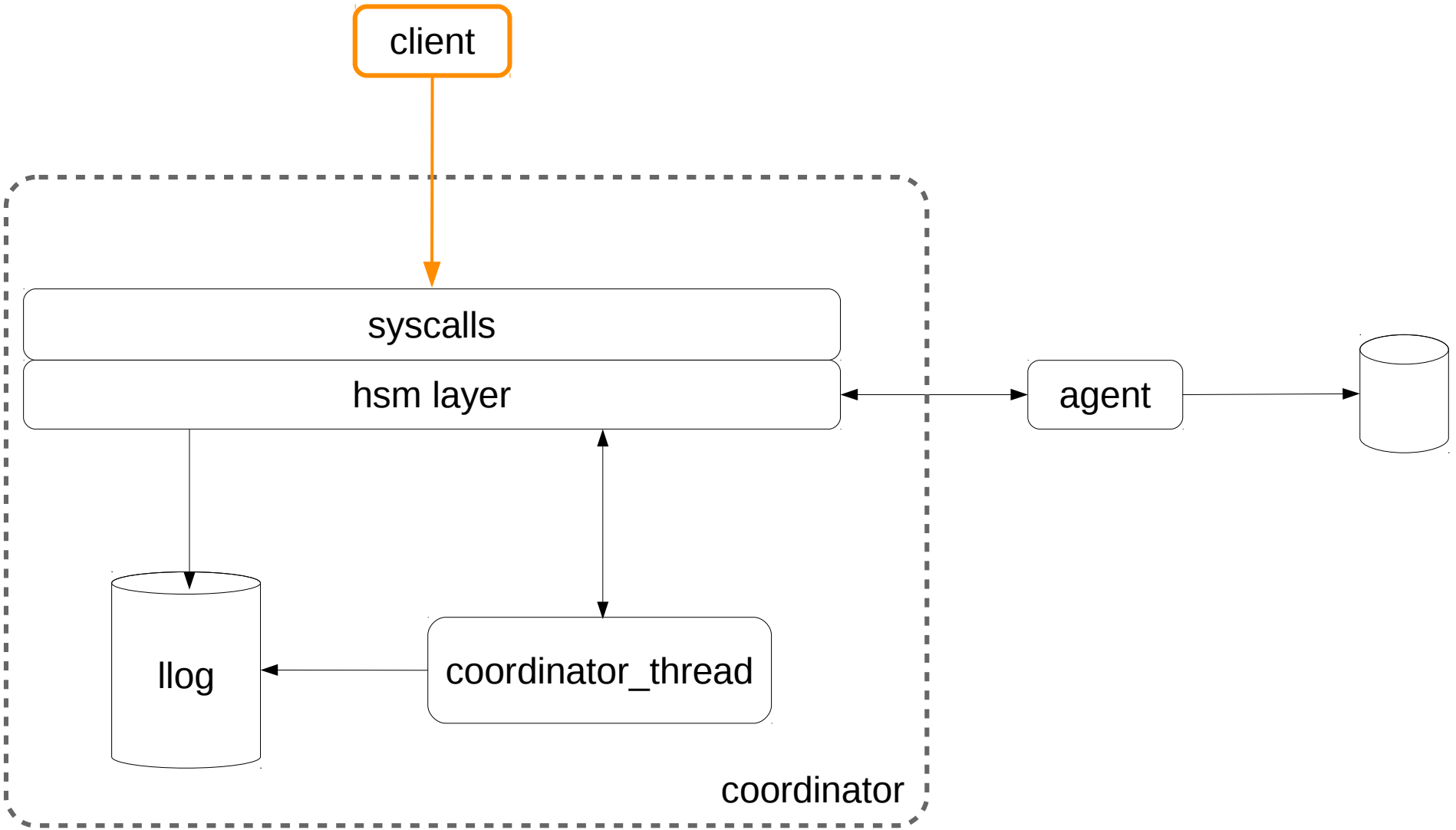

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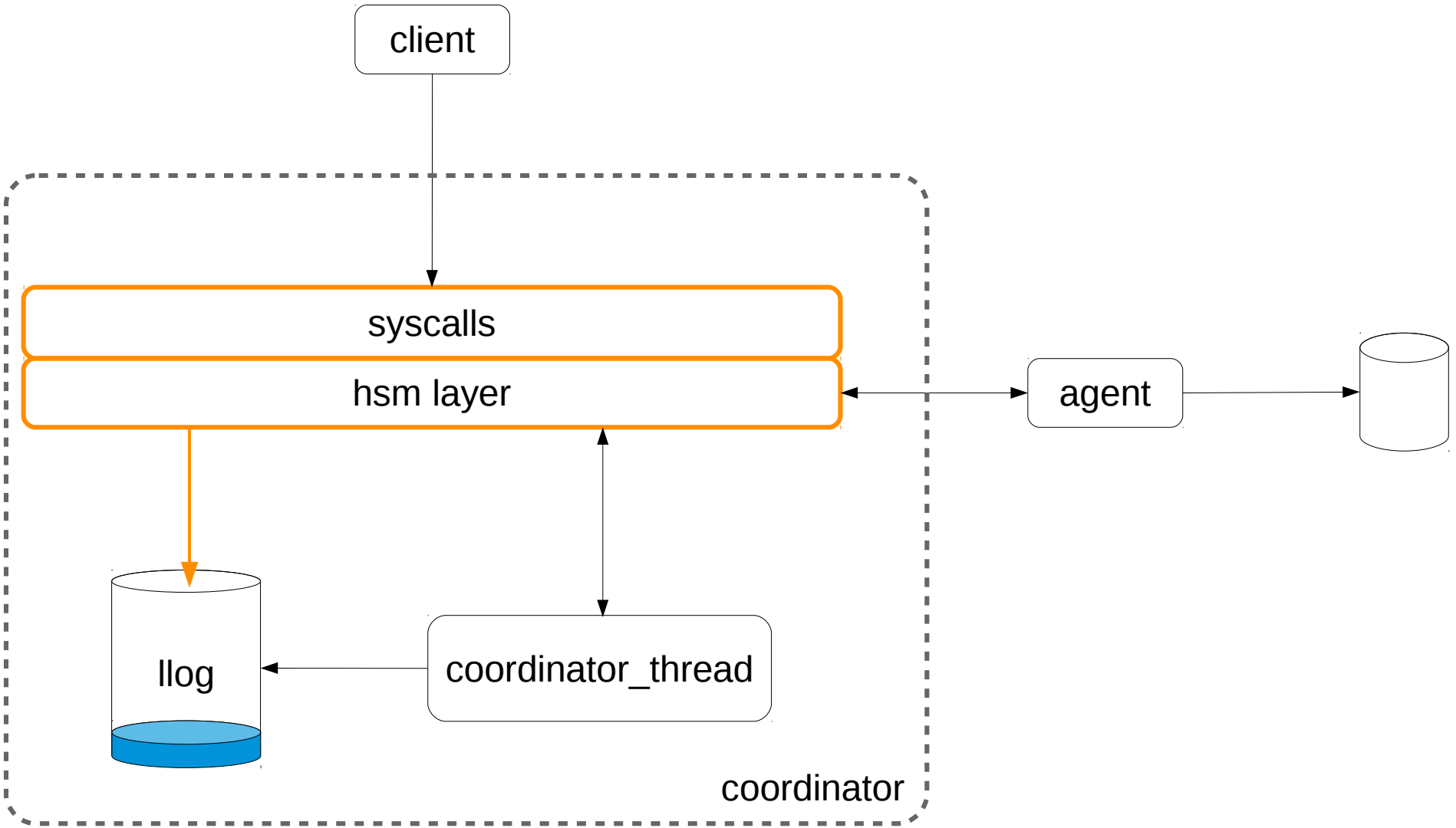

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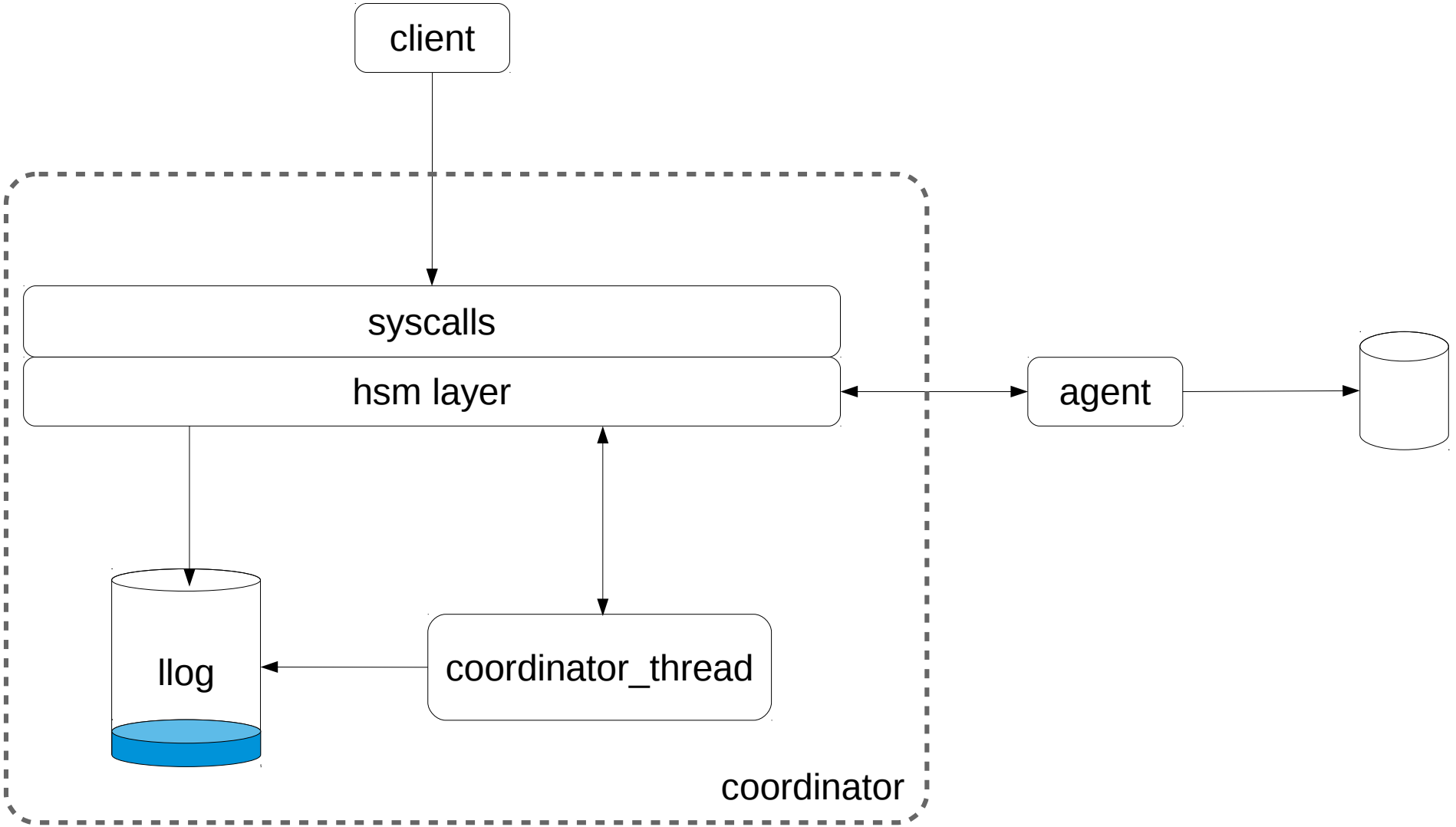

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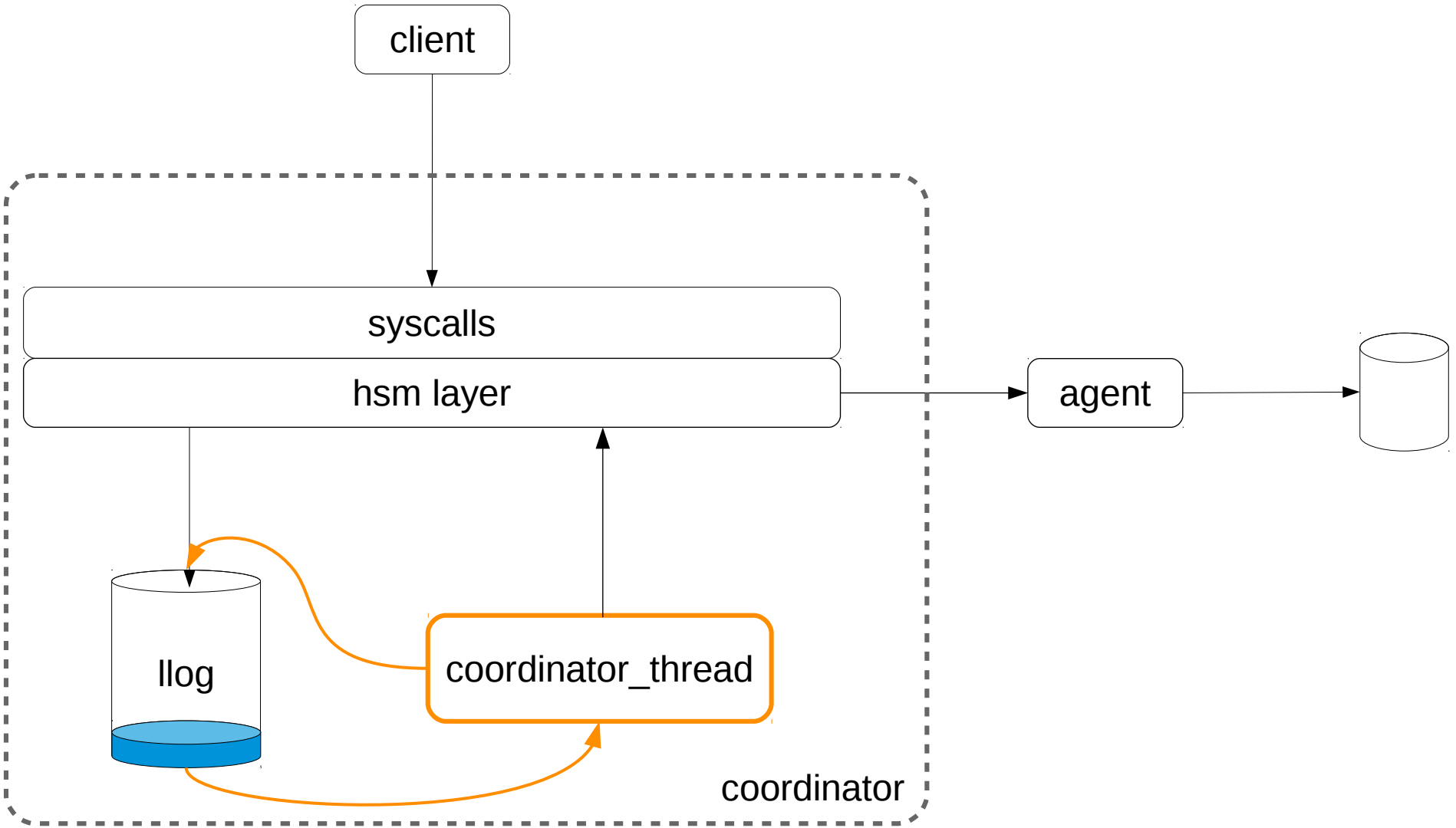

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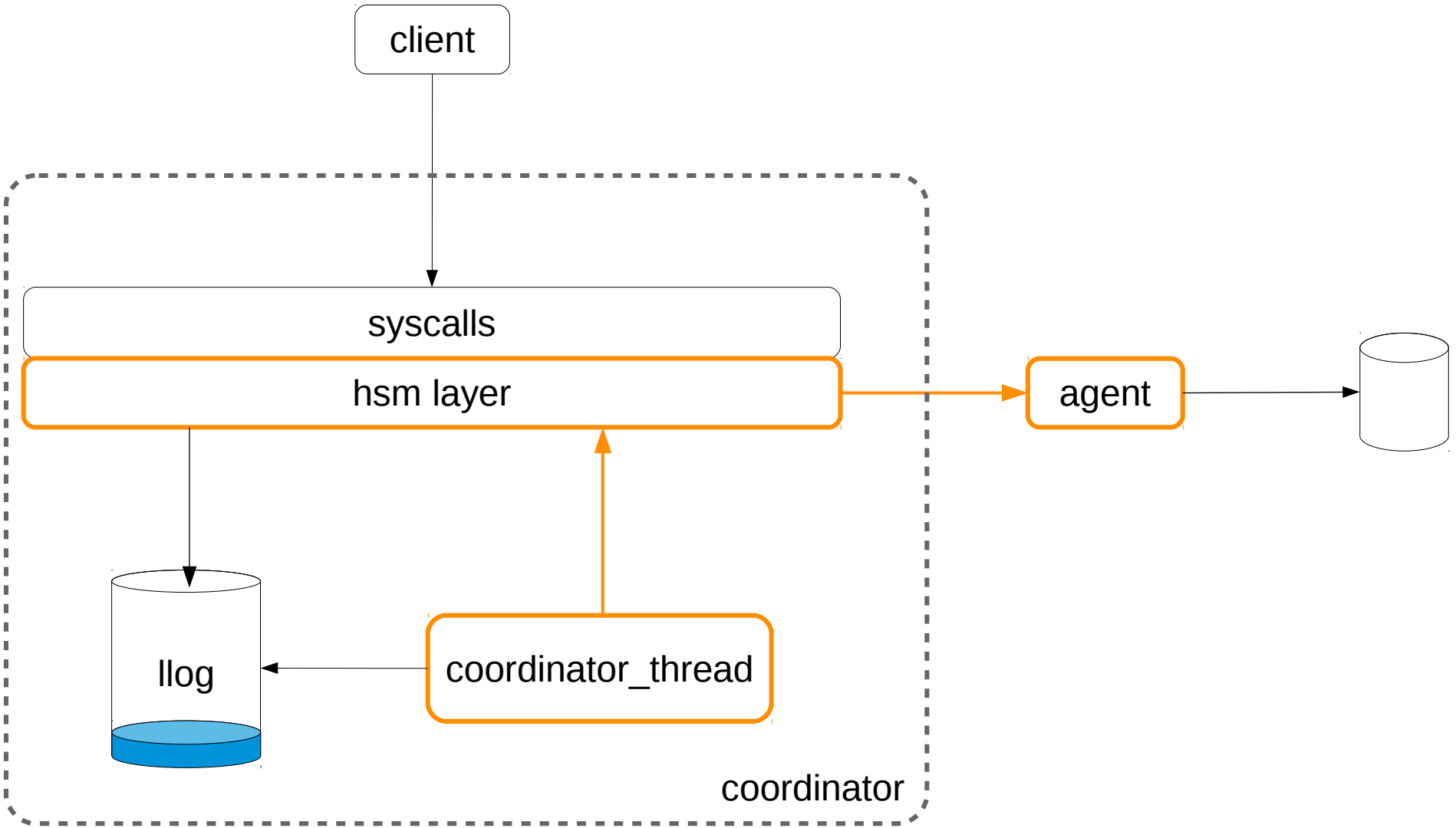

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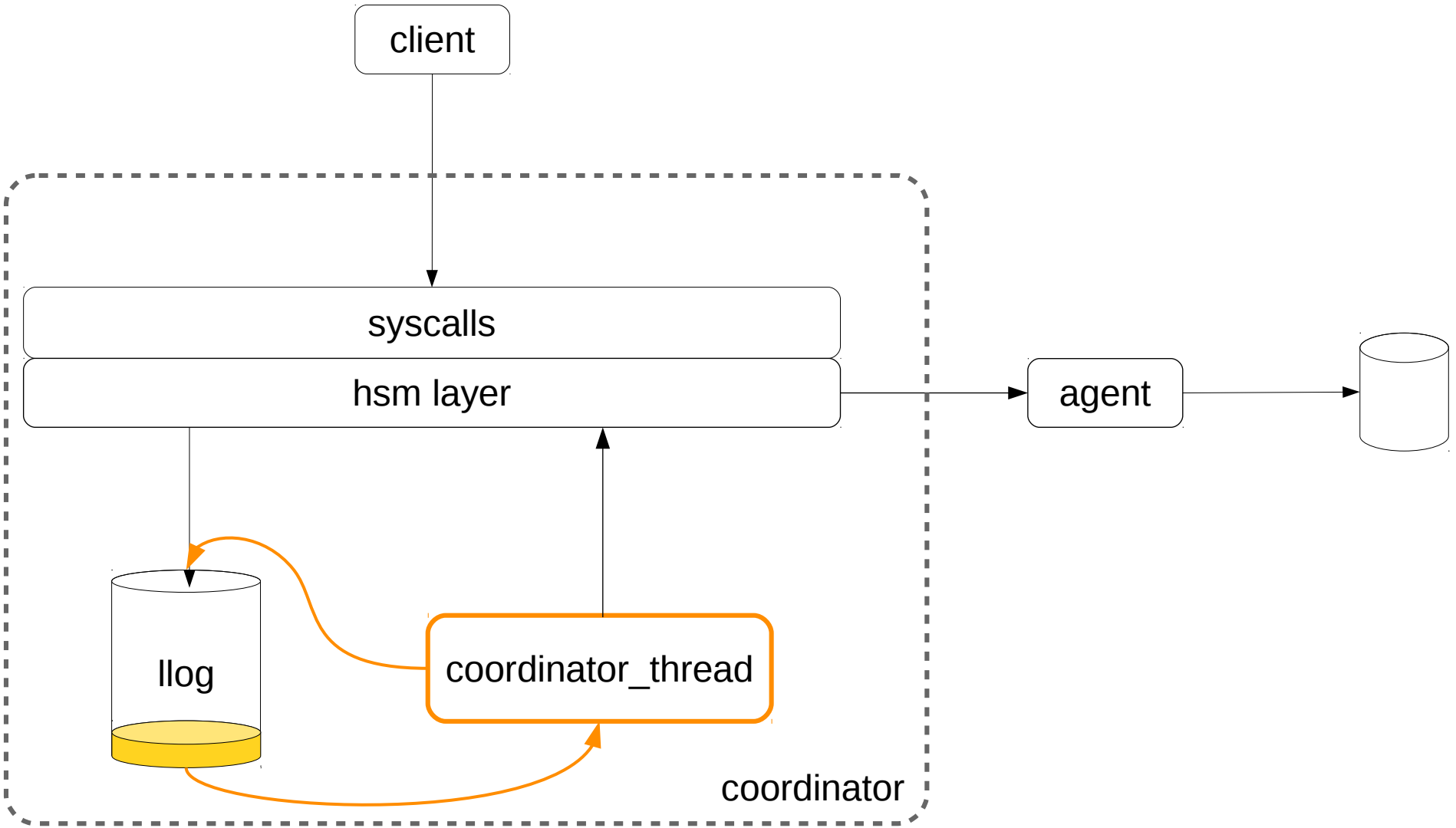

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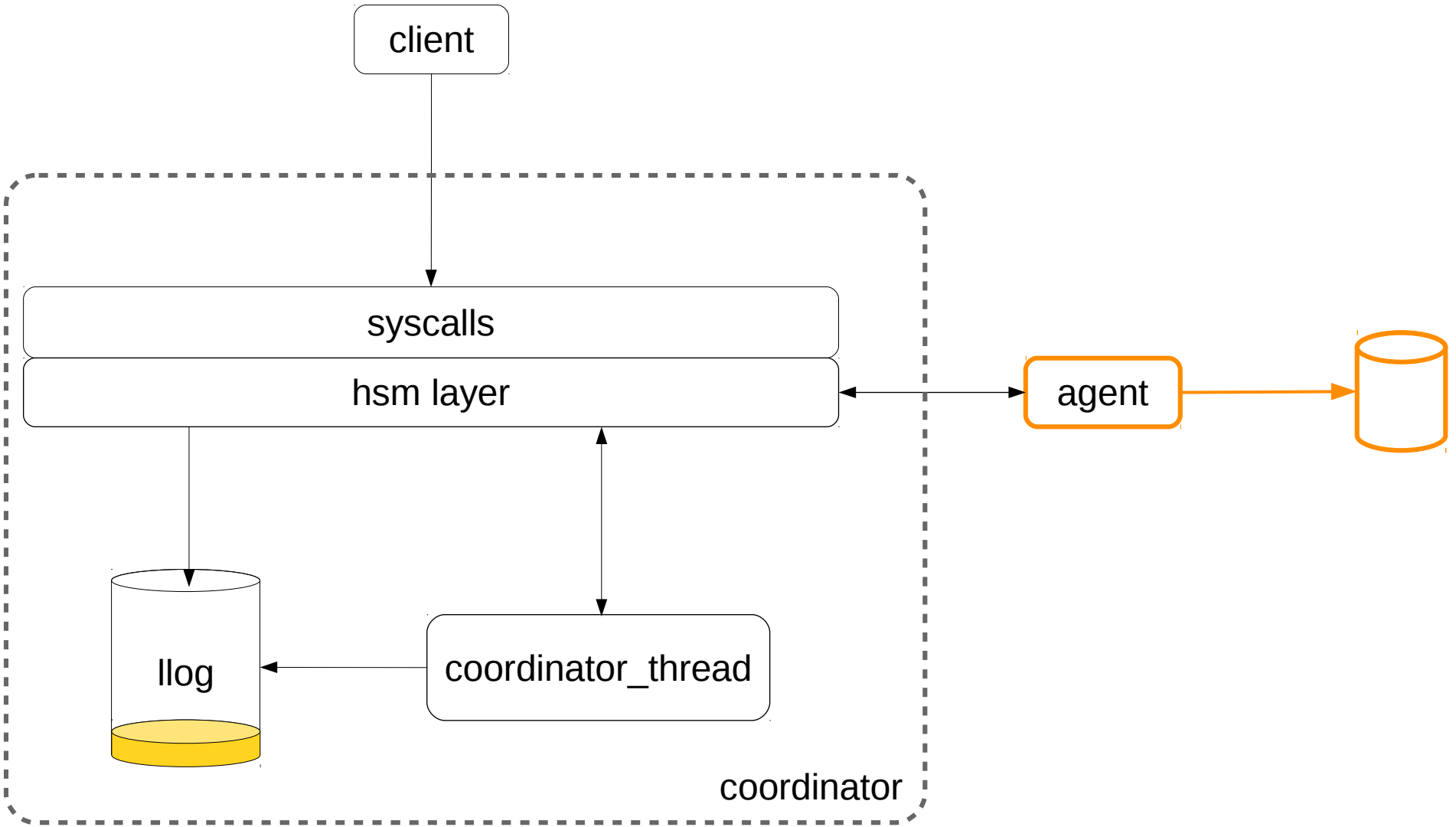

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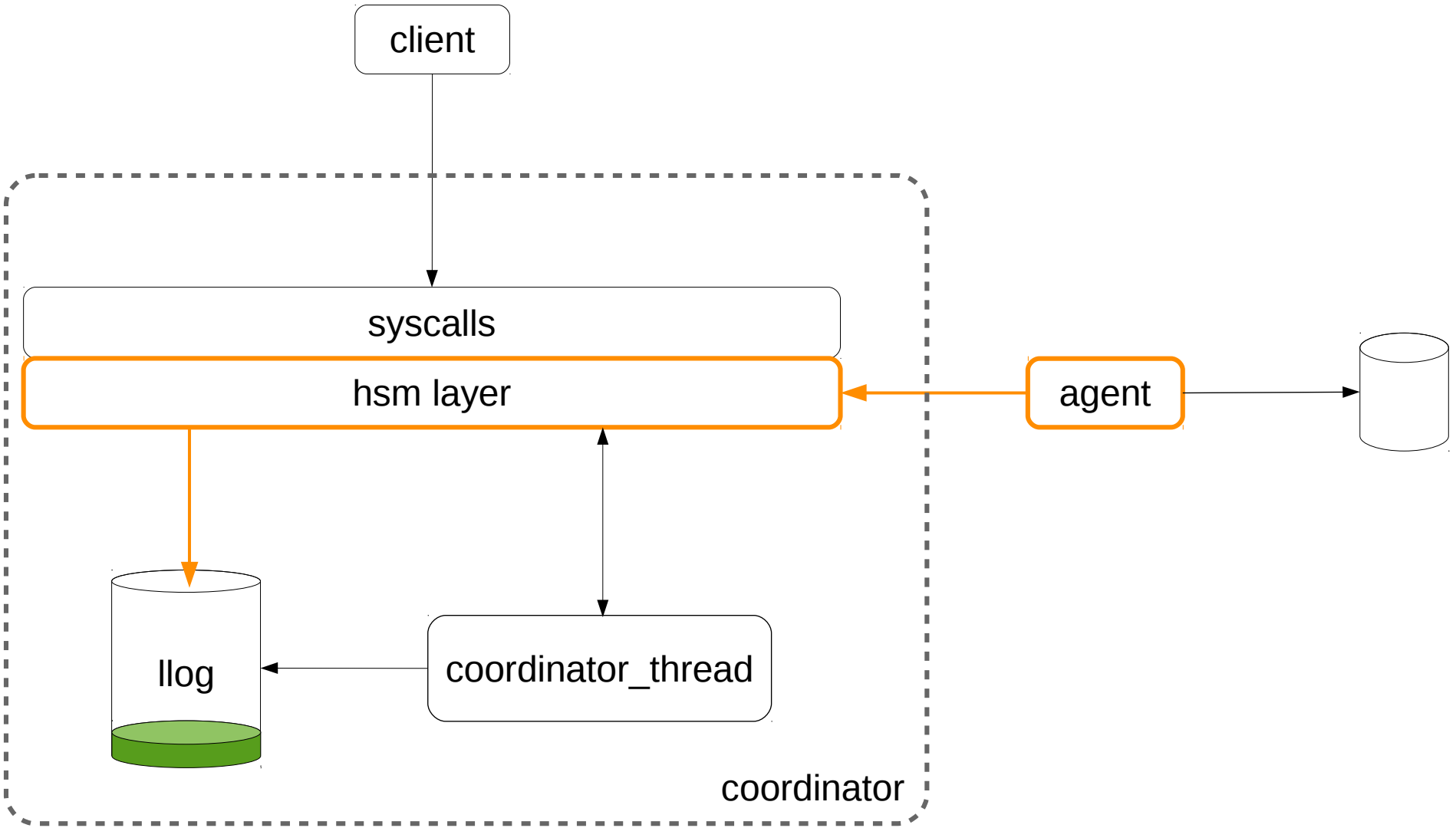

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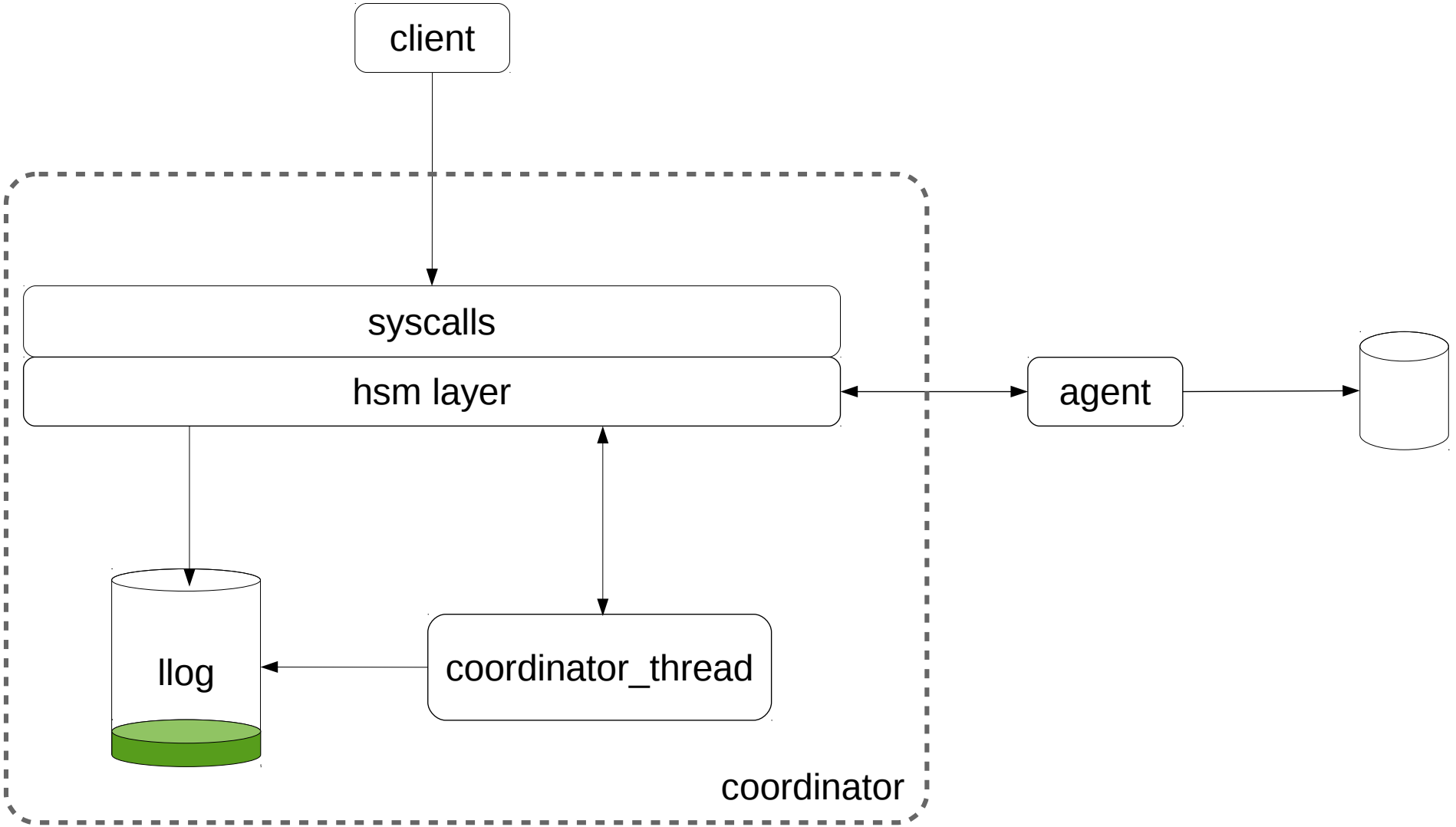

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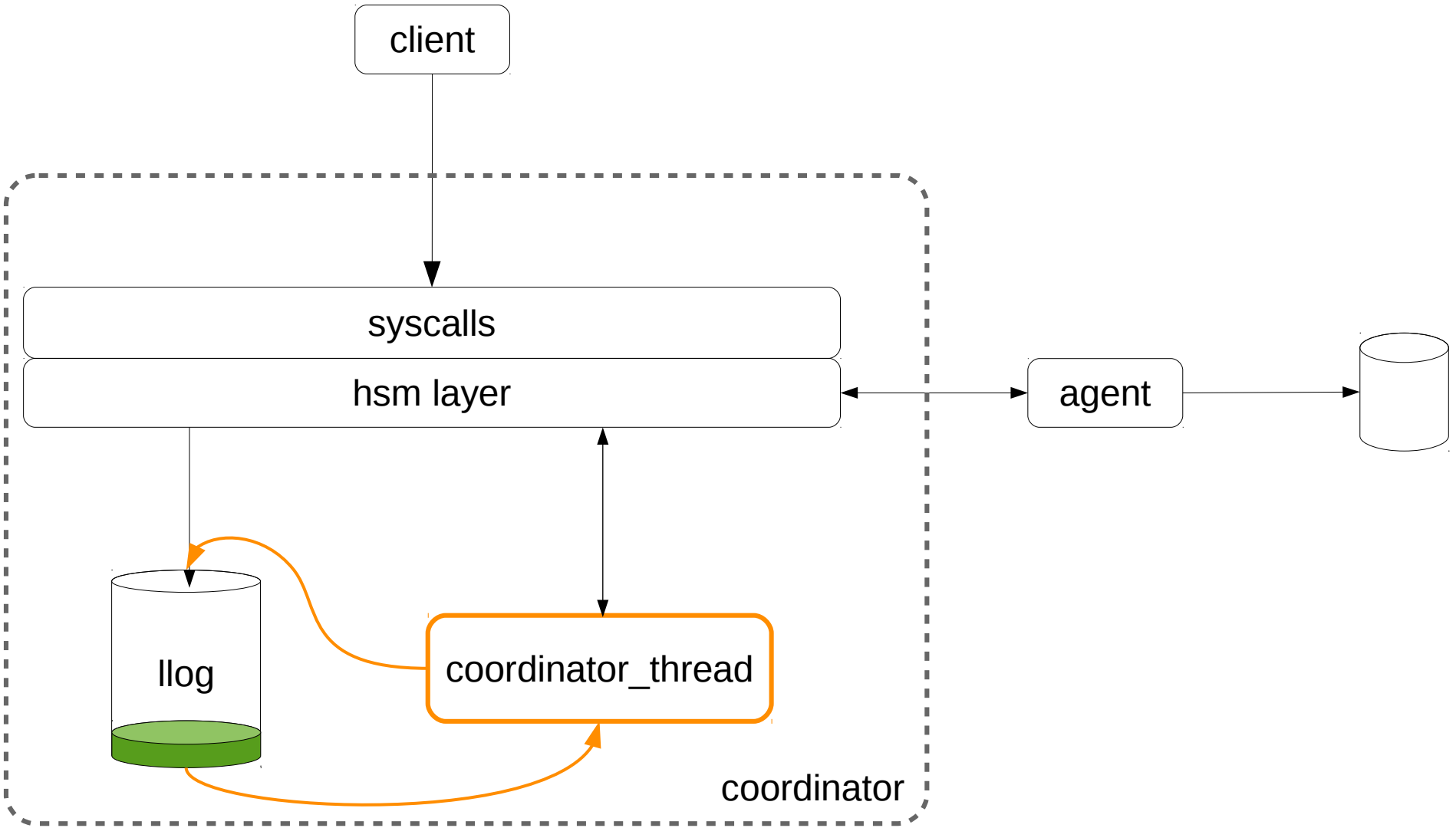

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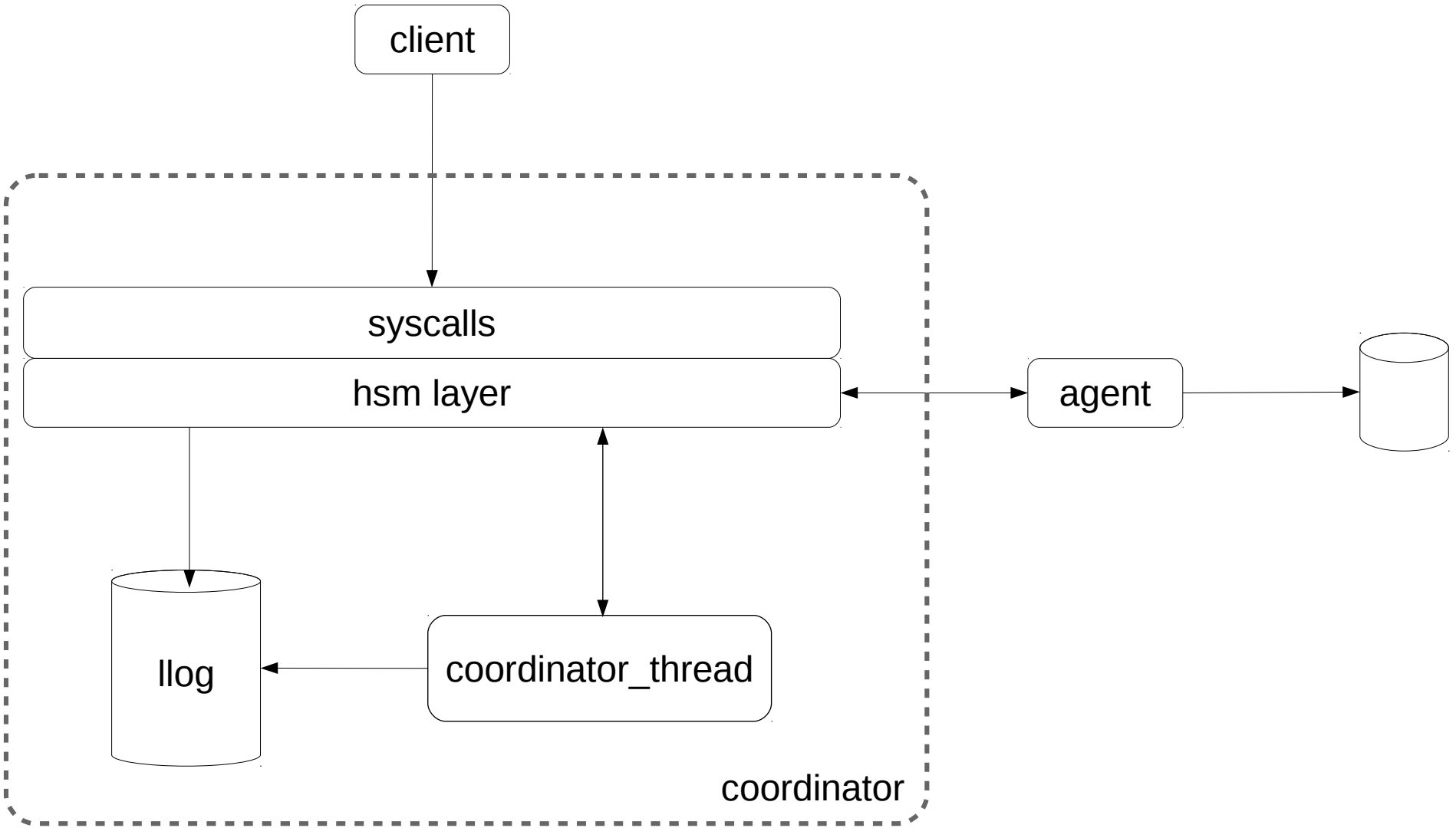
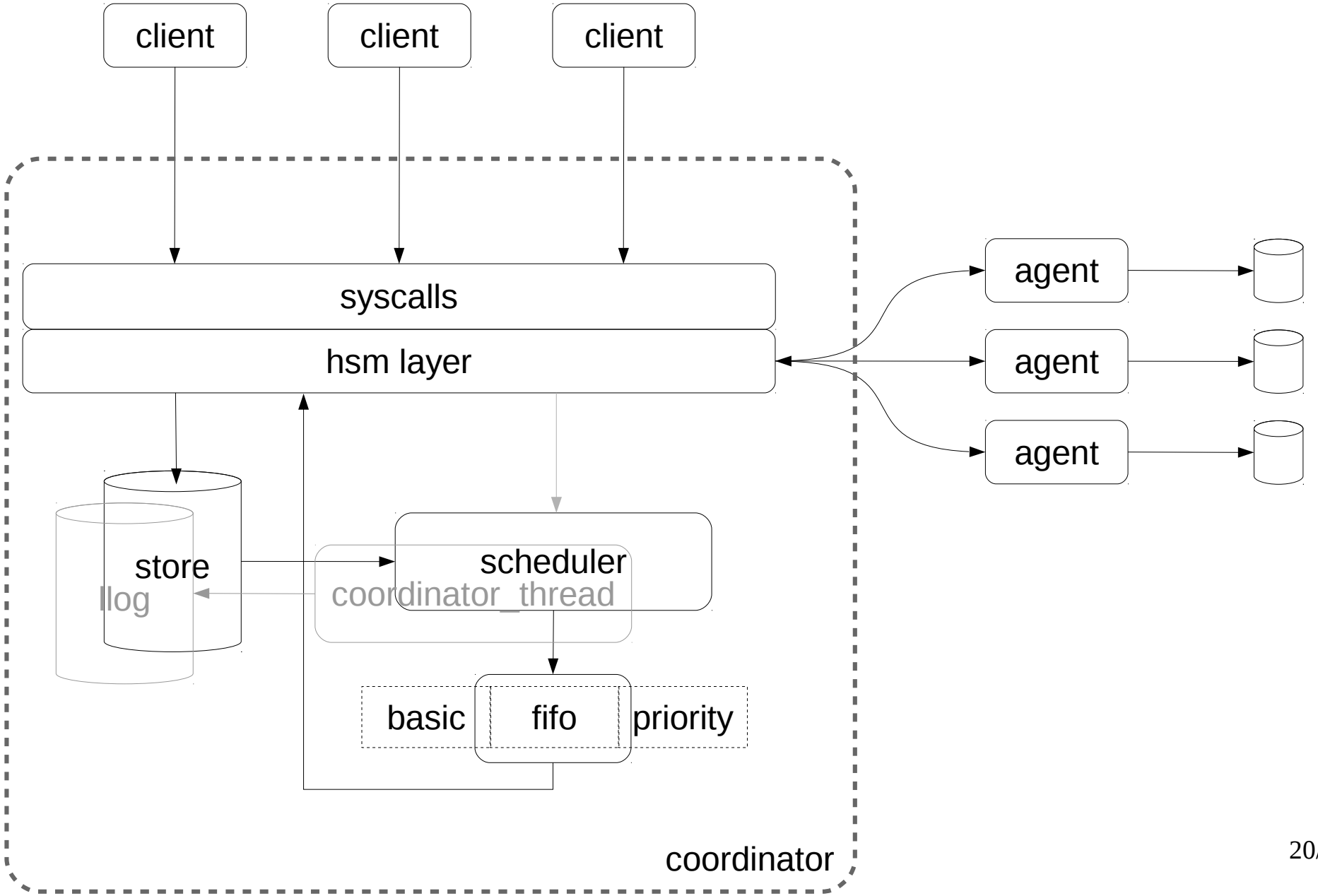


Proposal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basic
fifo
priority
coordinator

New structures

scheduler:

- declare_request
- cancel_request
- register_agent
- unregister_agent

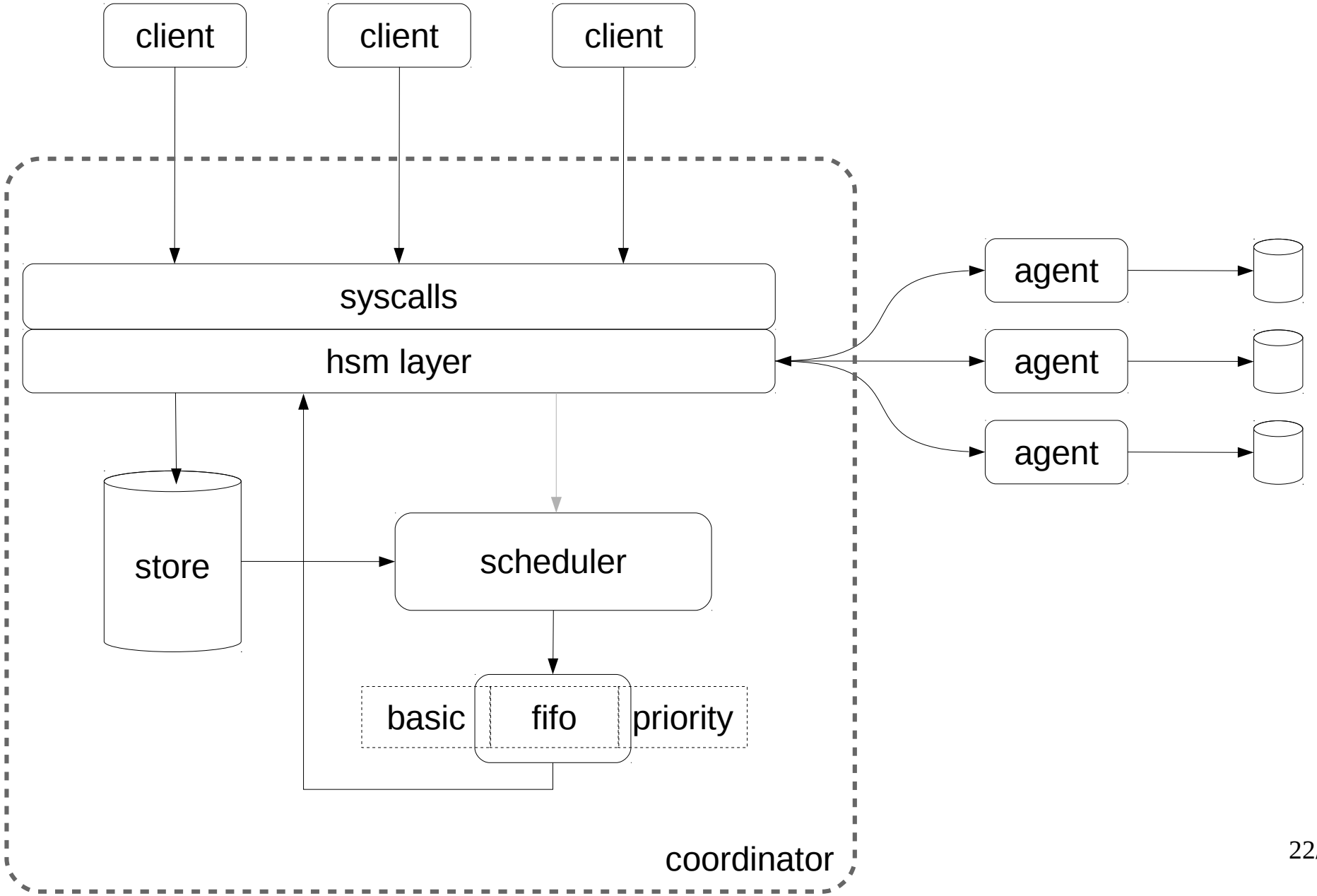
store:

- declare_request
- cancel_request

iterator:

- next

Proposal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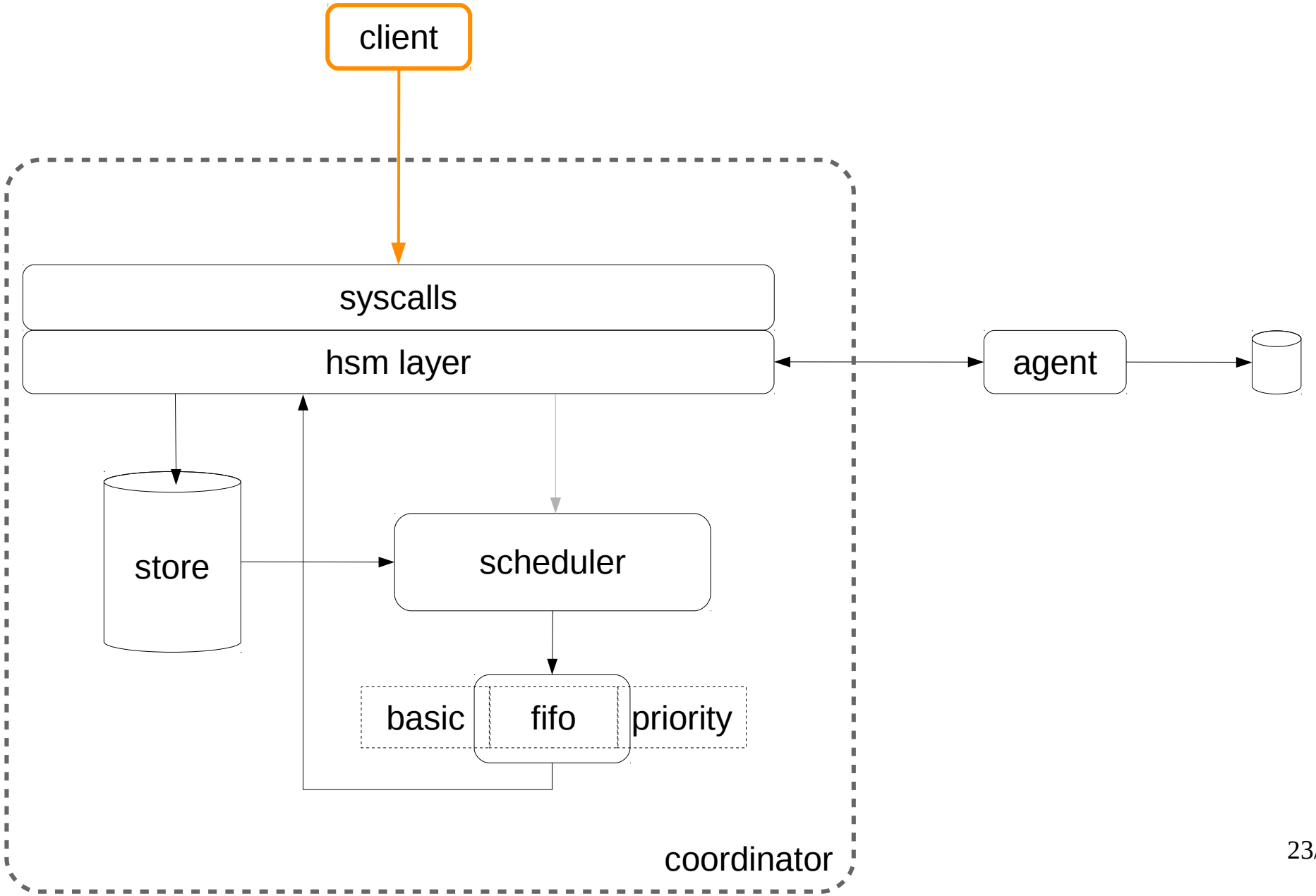
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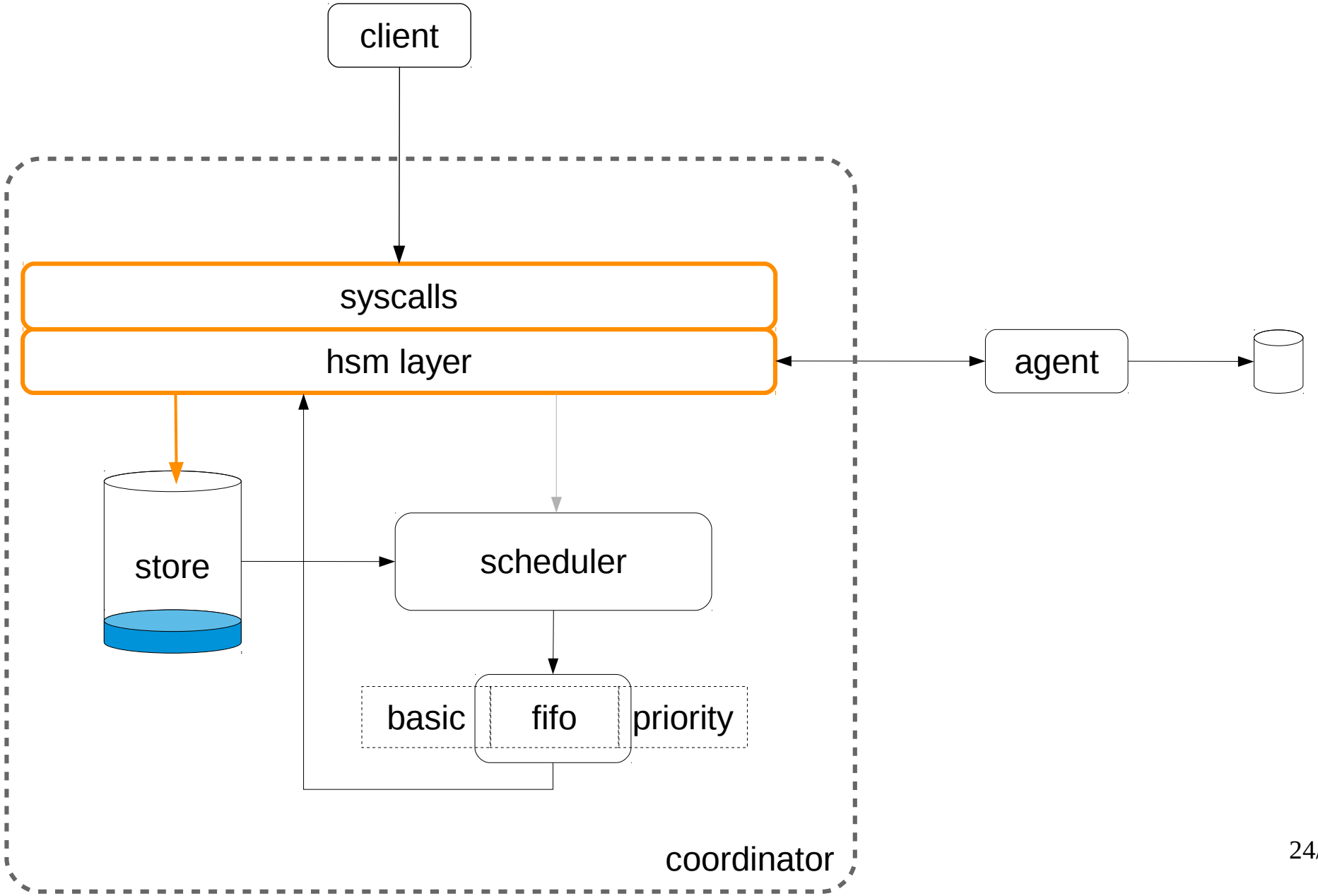
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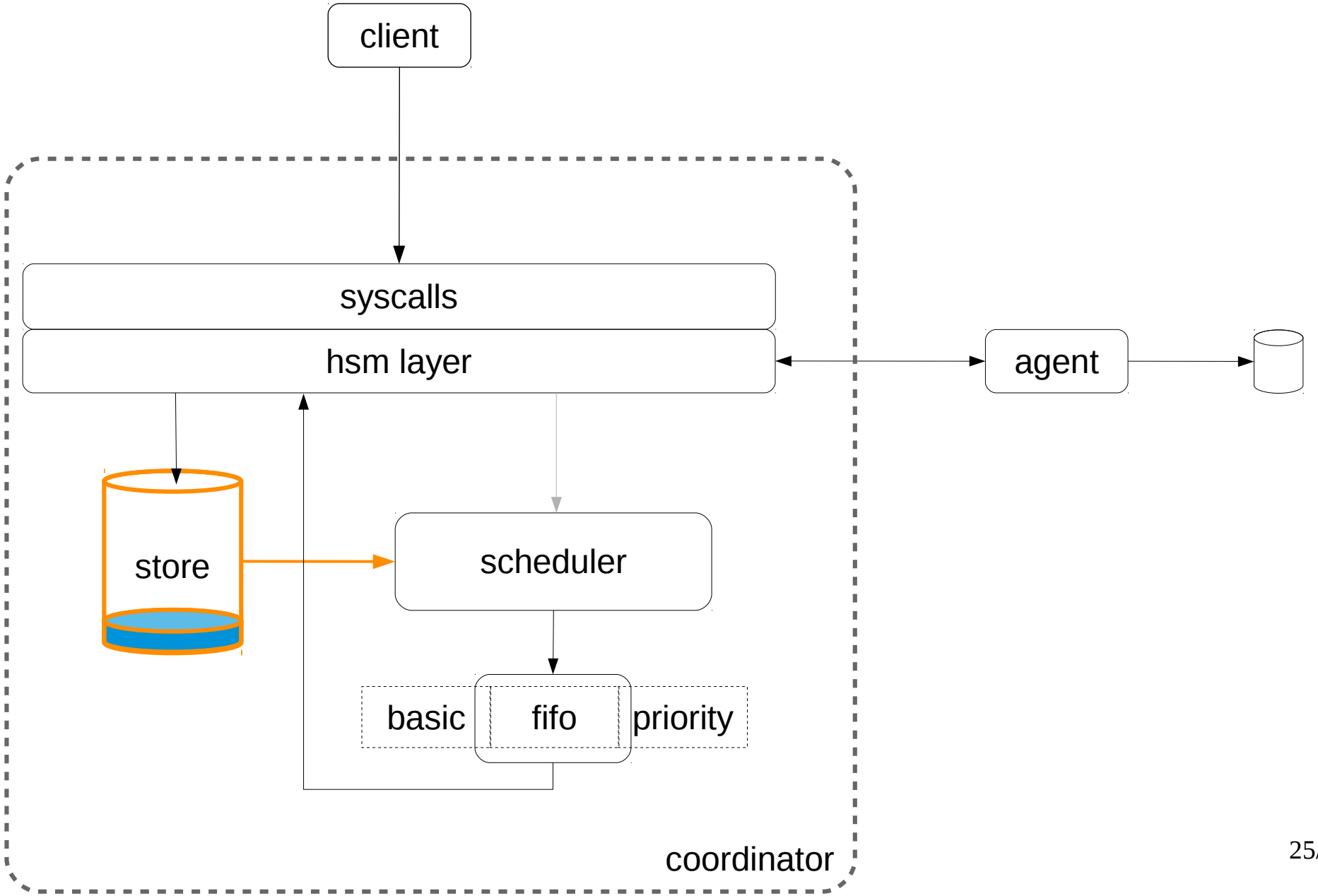
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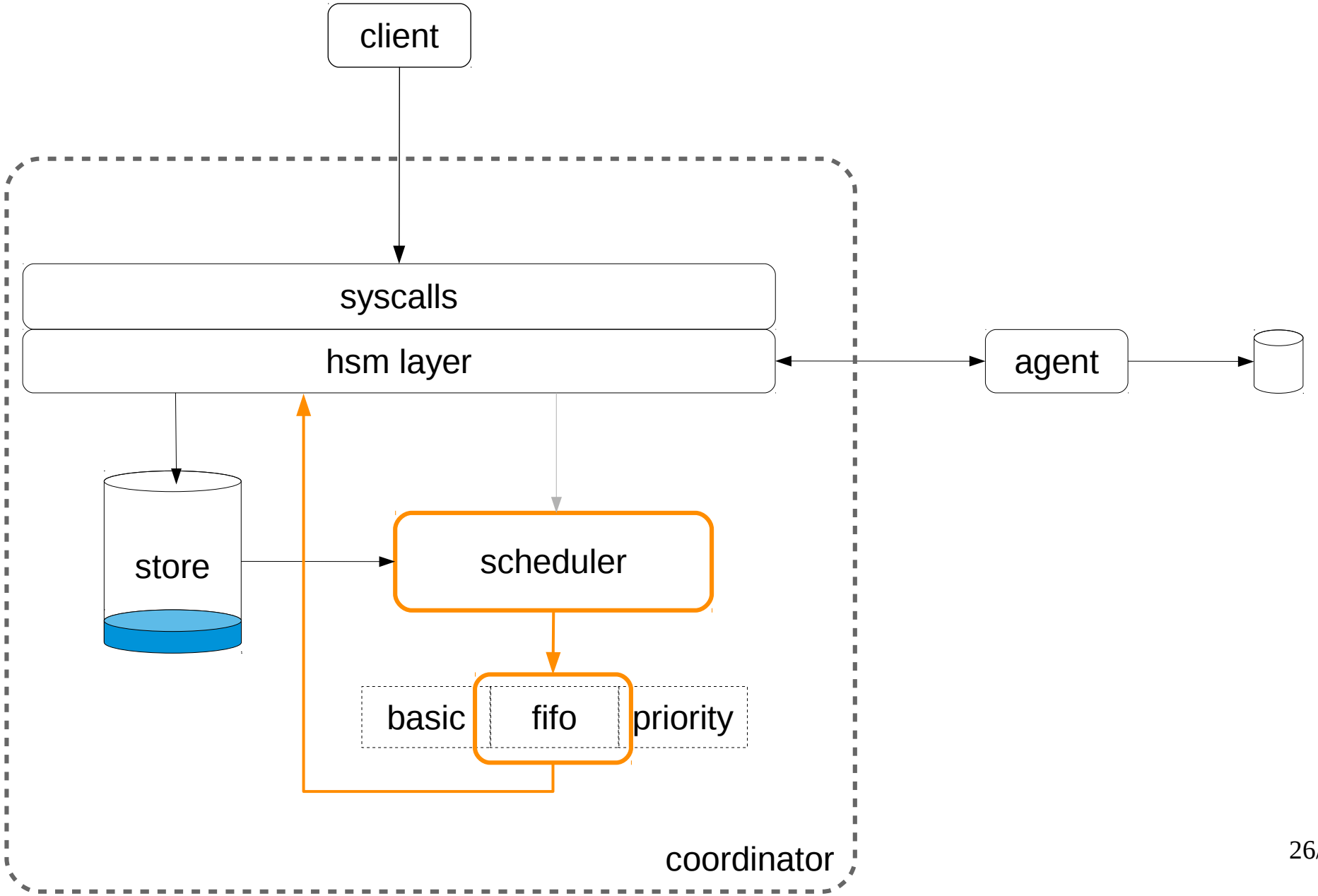
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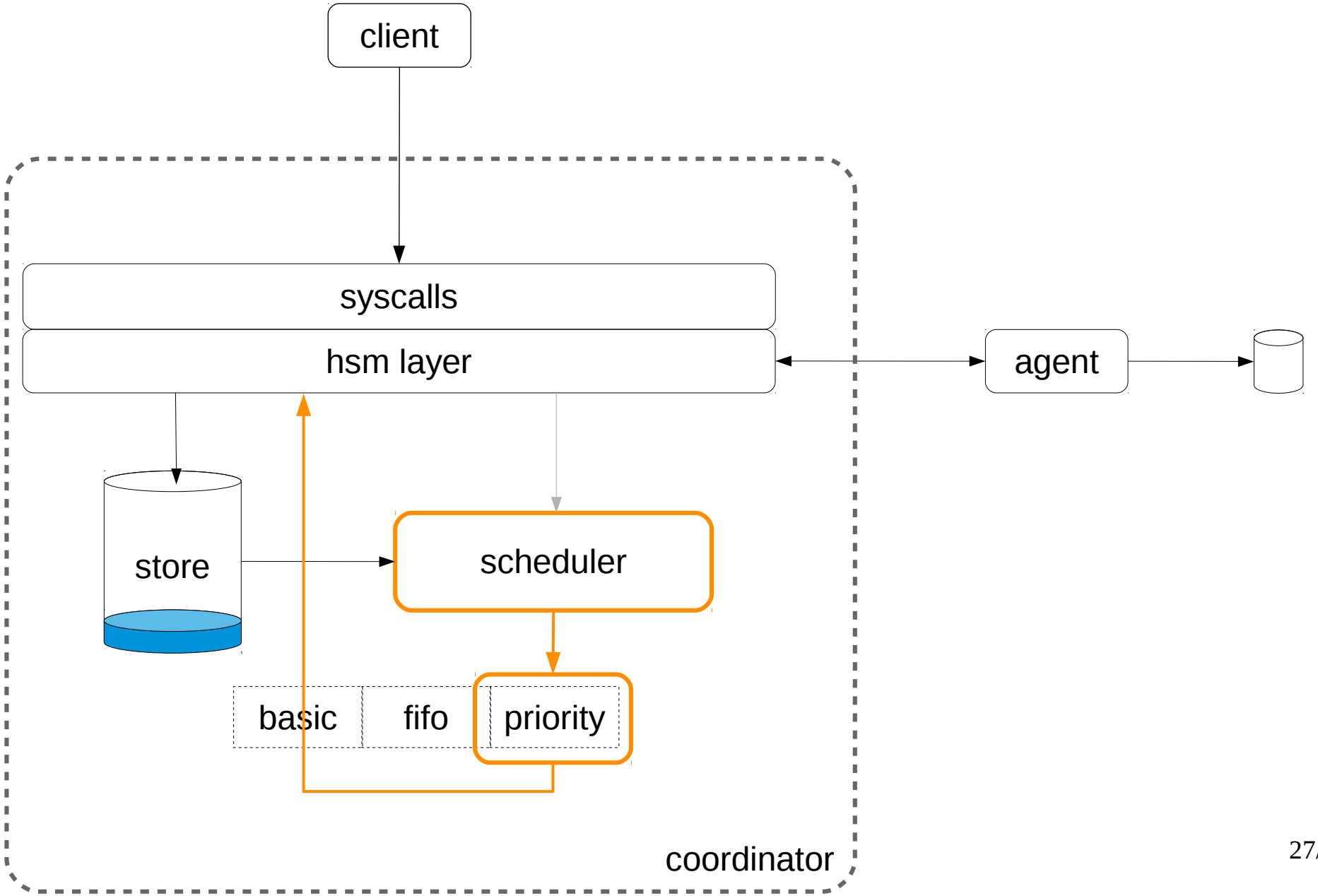
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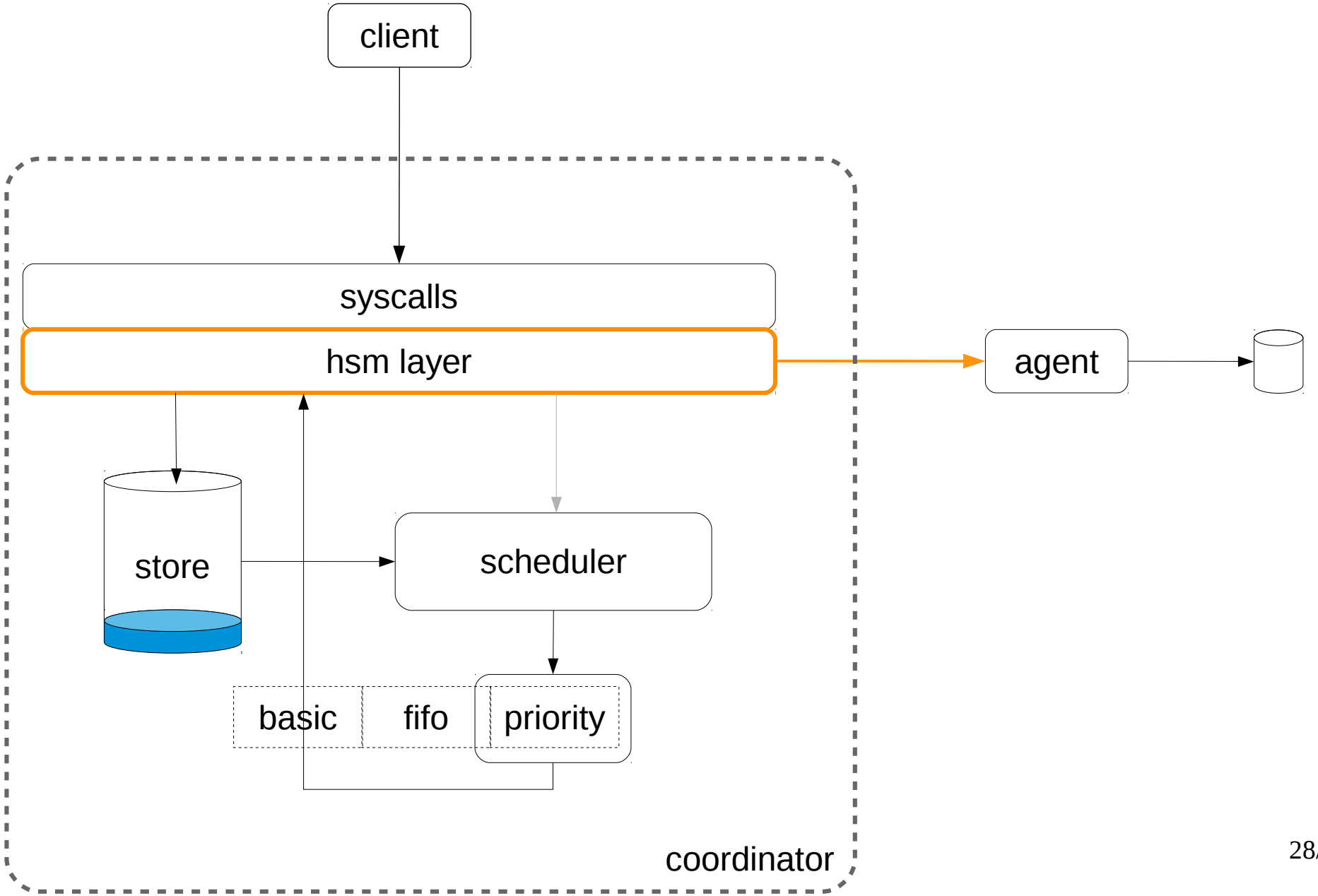
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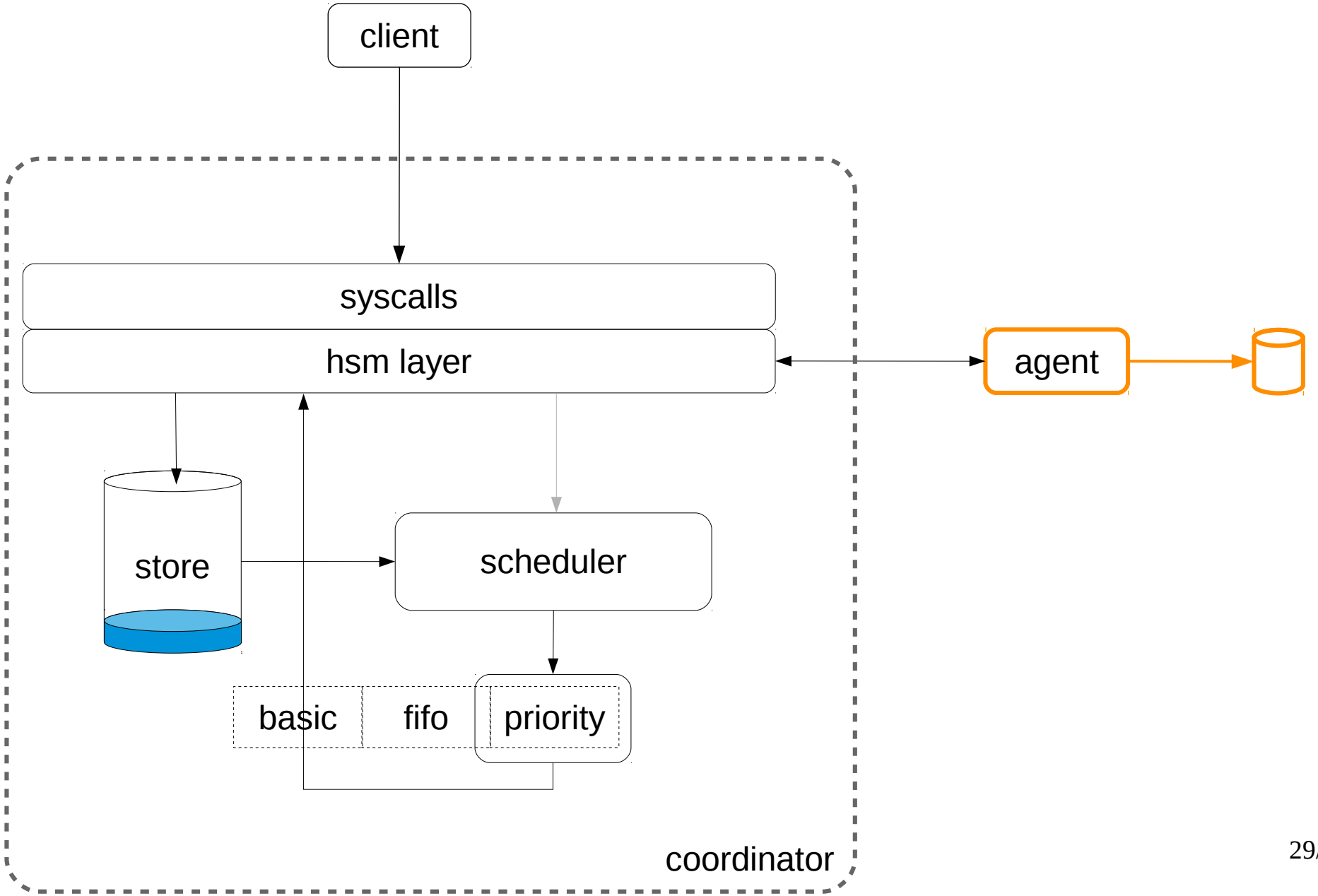
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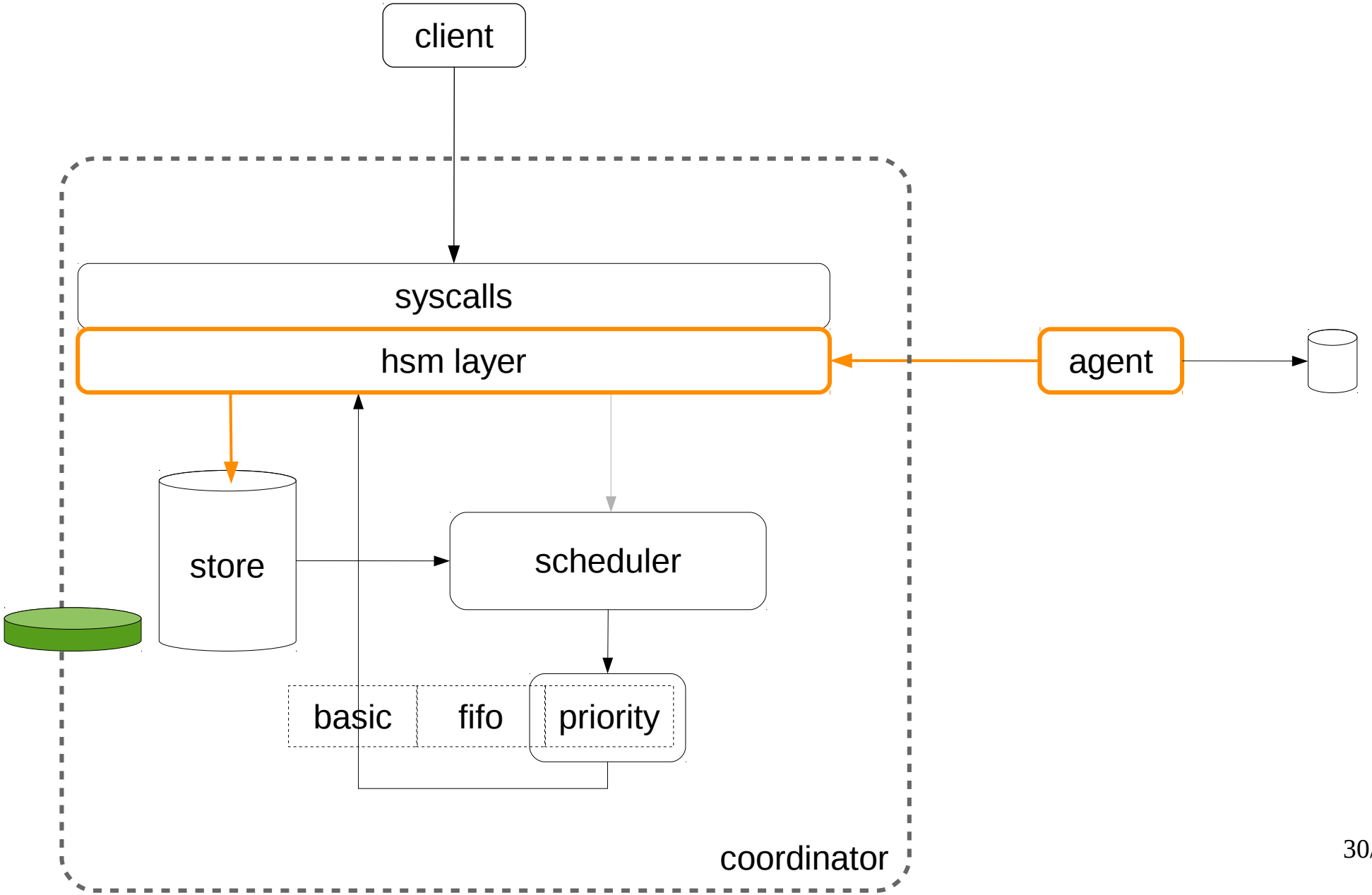
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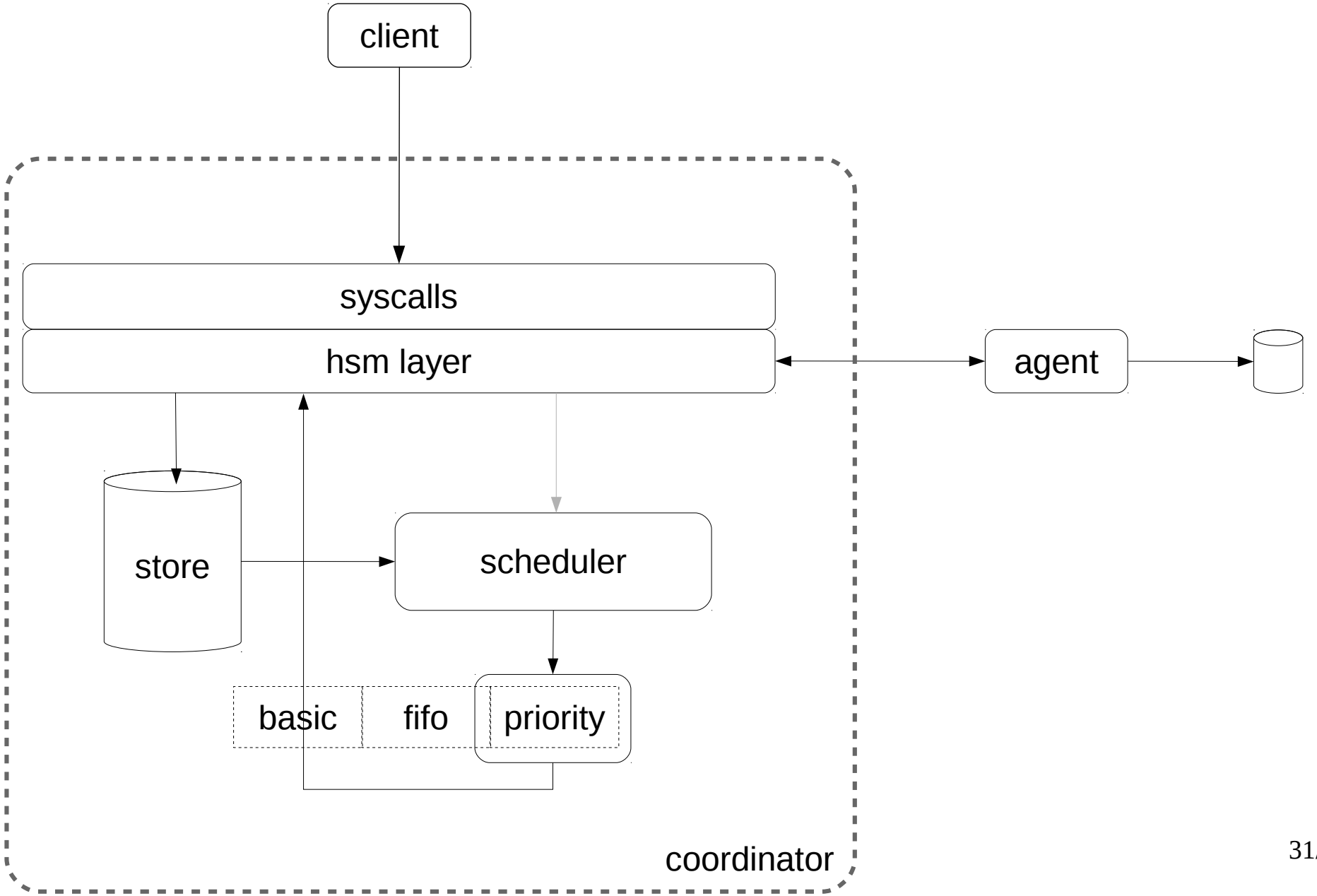
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Pros and cons

+ scalable
+ tunable / improvable
+ cleaner code
+ new features

– hard to integrate
– lots of coding / review

DE LA RECHERCHE À L'INDUSTRIE

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Thank you!

Integration planning

1. Clean split between hsm and mdt
2. General code cleanup
3. Remove completed requests from the llog
4. Stop storing the requests' state in the llog
5. Replace the llog (?)
6. Move on to loadable policies