piLite: a unified interface to local resource managers on supercomputing resources

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What is piLite?

- piLite is a gateway designed to unify the process of remote jobs execution and management on supercomputing resources
- The program provides a common interface that masks the real local resource manager (LRM) used on remote supercomputer installation
- piLite can be used via direct remote access to the supercomputing resources as well as in GridNNN infrastructure as a regular gateway

PiLite functionality

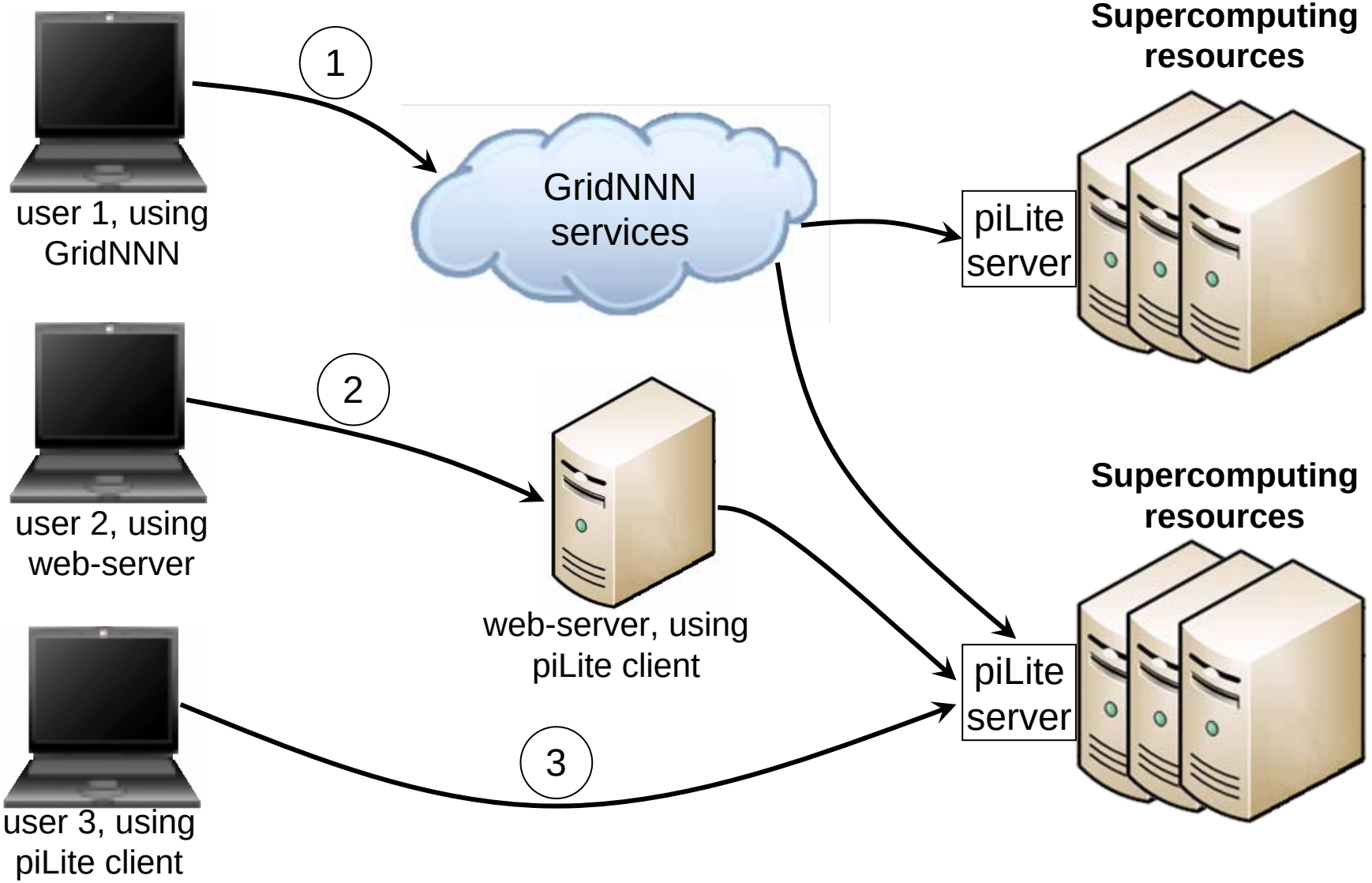
- jobs submission *(job-submit)*
- obtaining job status *(job-status)*
- obtaining list of active jobs *(job-list)*
- premature job termination on user's command *(job-cancel)*
- output data management *(job-get-output)*
- a real time downloading of the special monitoring file intended to track the correctness of the job execution *(job-get-monitor)*

PiLite components

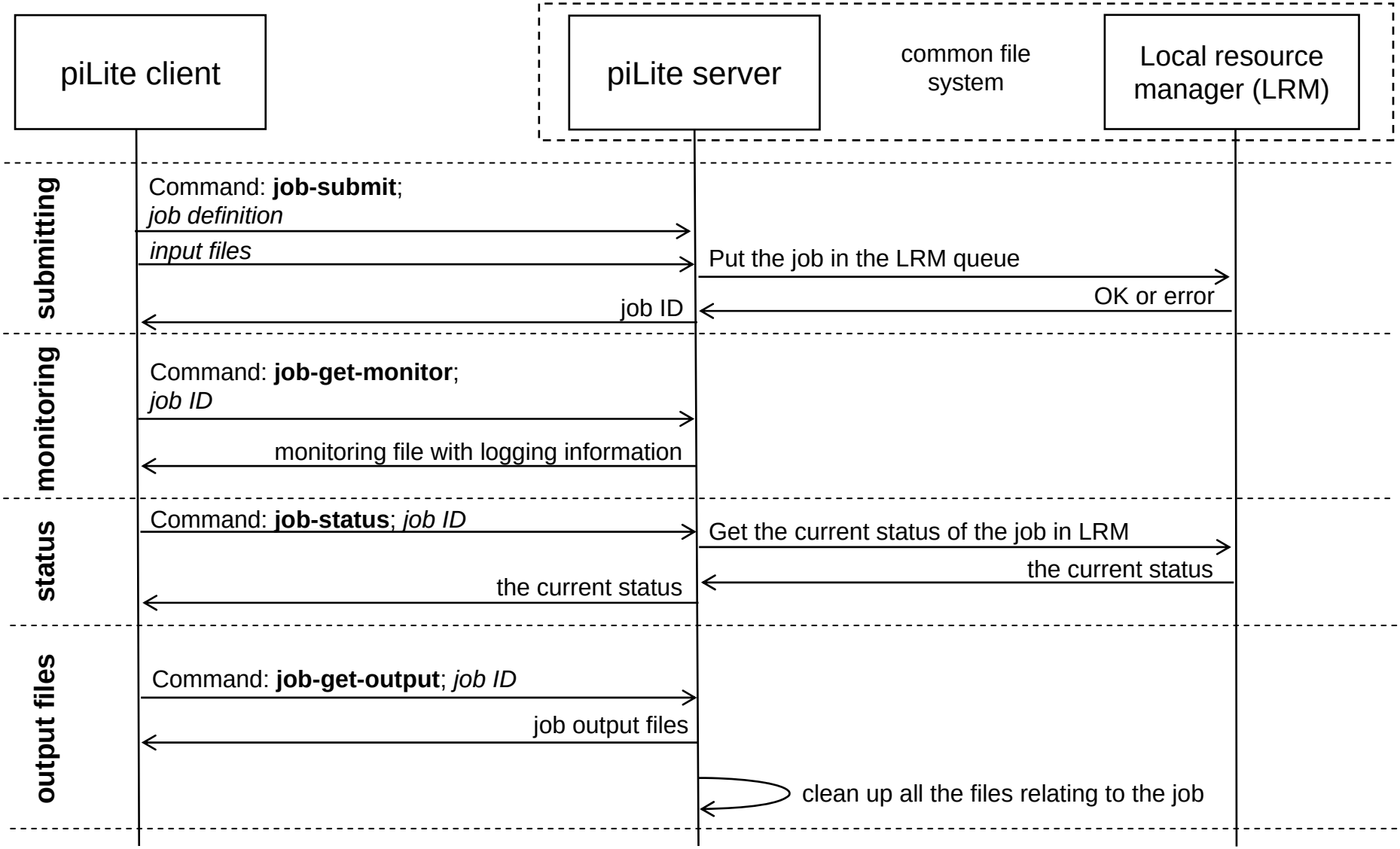
The program consists of two components:

- piLite server - a common unified interface to LRM
  - should be installed on supercomputing resources
  - fully compatible with the GridNNN RESTful web services in program interface and job definition format
- piLite client - portable, lightweight command-line tool used for direct remote access to the piLite server
  - could be combined with the web interface thus providing more simplicity in use of supercomputing resources

How does it work?



Sequence diagram



Implementation features

- piLite is an open-source project available on github: *https://github.com/grid4hpc/pilite*
- piLite is written in Perl
- Interoperation:
  - being installed on supercomputing resources piLite server could easily be integrated into the existing GridNNN infrastructure
  - piLite client interoperates with piLite server using Secure Shell protocol (SSH)
- Currently supported LRMs:
  - PBS
  - Fork

Practical use

- piLite was used in GridNNN project (www.ngrid.ru)
- piLite was used as the gateway to the supercomputing resources during execution of the contract *No 14.514.11.4058* "Creating a numerical model of the water flow around a ship with account of the wave formation and laminar-turbulent transition in the boundary layer on the ship's hull".