The `ParallelTaskCollection`

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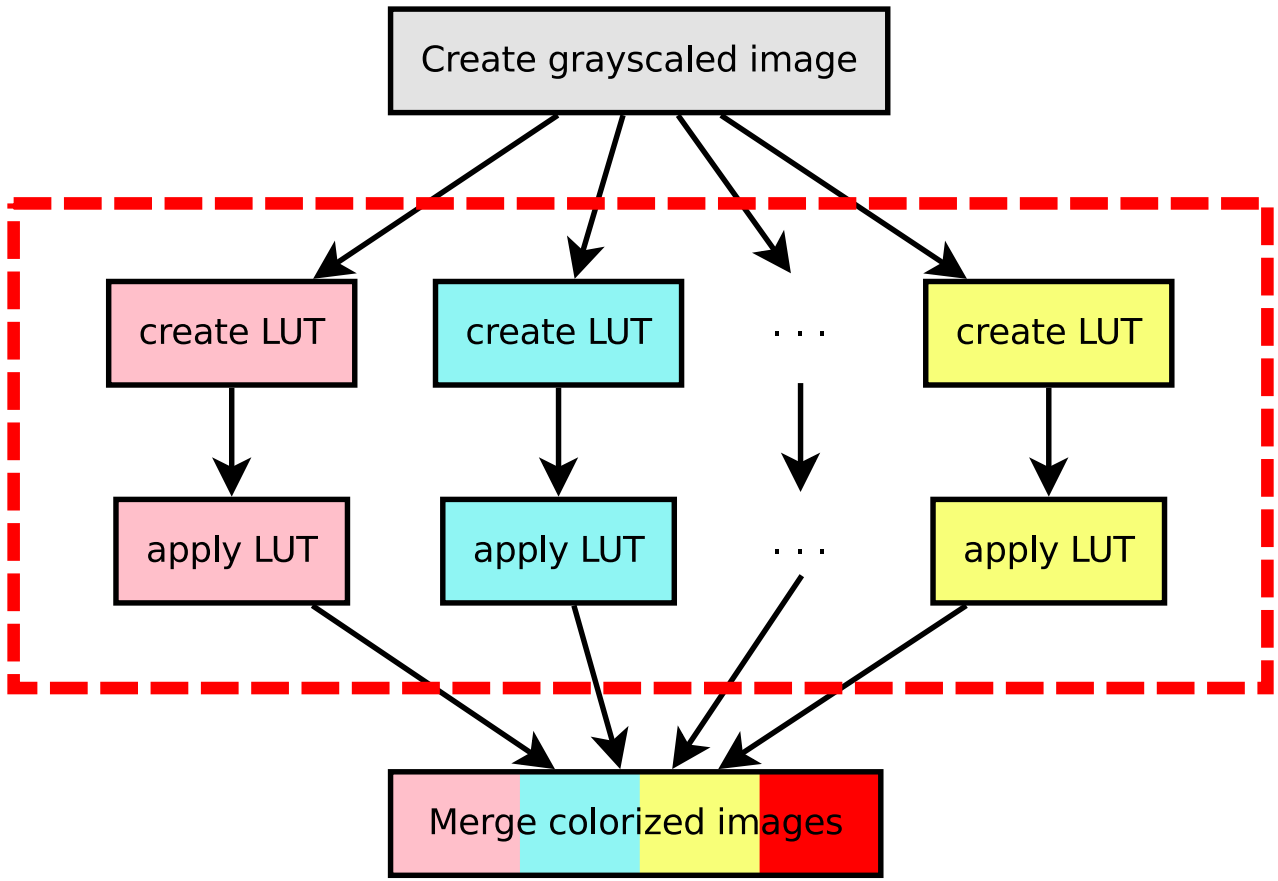
Running jobs in parallel

`ParallelTaskCollection` provides an interface for running jobs in parallel.



ParallelTaskCollection - example

```
from gc3libs.workflow import ParallelTaskCollection

class ParallelHello(ParallelTaskCollection):
    def __init__(self, hwstring, ncopies, **extra):
        tasks = []
        for i in range(ncopies):
            extra_args = extra.copy()
            extra_args['output_dir'] += ".%d" % i
            task.append(
                GHelloWorld(
                    hwstring,
                    **extra_args))
        # This is IMPORTANT!!!
        ParallelTaskCollection.__init__(self, tasks, **extra)
```

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Exercise 9.A

Start from the source code of exercise 5.B:

- Modify `new_tasks` so that it returns a list containing only an instance of a `ParallelHello` class.
- Create a `ParallelHello` class which inherits from `ParallelTaskCollection` and runs 20 instances of the `GHelloWorld` application.

Further customizations of `ParallelTaskCollection`

`terminated()` method: Default implementation:

```
def terminated(self):
    """
    Called when the job state transitions to `TERMINATED`,
    i.e., the job has finished execution (with whatever exit
    status, see `returncode`) and the final output has been
    retrieved.

    Default implementation for `TaskCollection` is to set the
    exitcode to the maximum of the exit codes of its tasks.
    """
    self.execution._exitcode = max(
        task.execution._exitcode for task in self.tasks
        )
```

The `self.tasks` attribute of the `ParallelTaskCollection` contains a list of all the tasks of the collection

Exercise 9.B

Start from the source code of exercises 5.C

- Create a `ParallelCpuinfo` class which inherits from `ParallelTaskCollection`
- update `new_tasks` method to return a list of `ParallelCpuinfo` instances.
- implement a `terminated` method in the `ParallelCpuinfo` which prints the model names from the various `GArchApplication` applications
- modify the `after_main_loop` method of the `GArchScript` class in order to get the results from the various `ParallelCpuinfo` objects

Exercise 9.C

Create a new script that takes one or more directories from command line, creates a job for each file inside those directories and execute the `md5sum` command on each file in parallel.

- Create a `MD5SumApplication` application that accept one argument `filename` and execute `md5sum` on it.
- Create a `ProcessFilesInParallel` ParallelTaskCollection that, given a directory as argument, creates an `MD5SumApplication` application for each file in that directory.
- Create a `MD5SumScript` SessionBasedScript that takes one or more directories as arguments and runs a `ProcessFilesInParallel` task for each directory