MAQAO Quick reference sheet

Analysing with ONE view

```
$ maqao oneview --create-report=one -options=… -- <cmd>
```

ONE View general options:

- `-xp=exp_dir`: Path to directory storing the results. If omitted, directory `maqao_<timestamp>` will be created in the current directory.
- `--output-format=out_format`: Output format. Accepted values are `html` (default), `xlsx`, `text` and `all` (for all three formats).
- `--with-scalability=[on]|off(default)|weak`: Toggles scalability mode. The `multiruns_params` array must be filled in the configuration file.

Using a configuration file for ONE View:

- `--config=cfg_path`: Uses file `cfg_path` to retrieve options. Options in `cfg_path` are similar to the execution options described below (without '--' and replacing '-' with '_') and declared as Lua variables (`option="value"` or `option=number`). For instance: `run_command="<binary> -myoption"`
- `--create-config=sample_cfg`: Generates sample configuration file. If `sample_cfg` is omitted, "**config.lua**" will be created in the current directory.

Parallel execution options:

- `--omp-num-threads=num`: Number of OpenMP threads. Overrides the OMP_NUM_THREADS environment variable.
- `--mpi-command=mpi_cmd`: MPI runtime invocation. Will prepend `<cmd>`.
- `--number_tasks_nodes=num`: Number of MPI tasks (or processes) per node

Batch scheduling execution options:

- `--batch-script=script_path`: Path to job scheduler script. The script must have been modified to replace the application executable and its arguments with keyword `<run_command>`.
- `--batch-command=batch_cmd`: Command for invoking the job scheduler, using keyword `<batch_script>` to reference `script_path`.

Viewing reports:

- Text reports are displayed directly on the console output.
- HTML: open **<exp_dir>/RESULTS/<binary_name>_one_html/index.html** in a browser to display the HTML reports.
- XLSX reports are in file **<exp_dir>/RESULTS/<binary_name>_one_0_0.xlsx**
- The path to the reports is displayed at the end of ONE View analysis.

Legacy execution options (maqao 2.12 and earlier):

- `--binary=bin_path`: Path to application executable. Can be relative
- `--run-command=run_cmd`: Command to run the application, using keyword `<binary>` to reference `bin_path`. If omitted, considered to be `./<binary>`

Sample invocations of ONE View

- Command line on interactive MPI run

```
$ maqao oneview --create-report=one --mpi-command="mpirun -n 4" \
  --omp-num-threads=2 --number_tasks_nodes=2 -- <cmd>
```

- Command line for job scheduler script (script must be edited to replace `<cmd>` with `<run_command>`)

```
$ maqao oneview --create-report=one --batch-script="script.job" \
  --batch-command="my_jobsched <batch_script>"
```

- Using ONE View configuration file

```
$ maqao oneview --create-config=my_config.lua
{edit my_config.lua to fill all required variables}
$ maqao oneview --create-report=one --config=my_config.lua
```

- Compare existing ONE View reports

```
$ maqao oneview --compare-reports --inputs=exp_dir1,exp_dir2,… \
[-xp=output_dir]
```

Advanced: Invoking LProf / CQA separately

Profiling with MAQAO LProf

If ***exp_dir*** is omitted, a directory named ***maqao_lprof_<timestamp>*** will be created.

- Sequential / OpenMP profiling

```
$ maqao lprof [-xp=exp_dir] -- ./foo arg1 arg2 …
```

- MPI / hybrid profiling

```
$ maqao lprof [-xp=exp_dir] --mpi-command="mpirun -n 32 -ppn 4" \
  ppn=4 -- ./foo arg
```

- Displaying profiling results

```
$ maqao lprof -xp=exp_dir -df # Functions profiling results
$ maqao lprof -xp=exp_dir -dl # Loops profiling results
```

Analysis with CQA

id1, *id2*, *id3* … are the numerical loop identifiers returned by **LProf**.

- Analysing a given loop or set of loops

```
$ maqao cqa ./my_app -loop=id1,id2,id3…
```

- Analysing all innermost loops in a given function or set of functions

```
$ maqao cqa ./my_app -fct-loops="regexp"
```

- Analysing the body of a given function or set of functions

```
$ maqao cqa ./my_app fct-body="regexp"
```

regexp is a regular expression: *foo* matches "foo1", "foo" or "afoo", while *^bar$* matches "bar" only