

## Analysing with ONE view

```
$ maqao oneview -R1 [options] -- cmd
```

cmd corresponds to the name of the executable to analyse and its parameters.

### **ONE View general options:**

- `-xp=exp_dir`: If specified, the results will be stored in directory exp\_dir. If omitted, directory `maqao_<timestamp>` will be created in the current directory.
- `--output-format=html` (default) | `xlsx` | `text` | `all`: Output format.
- `--with-scalability=[strong` (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`). Other variables can be referenced by enclosing them in brackets (`<>`). For instance: `mpi_command="mpirun -n <number_processes>"`
- `--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:**

- `--mpi-command=mpi_cmd`: MPI runtime invocation. Will prepend cmd.
- `--number-processes-per-node=num`: Number of MPI tasks (or processes) per node (recommended if known and `num > 1`)

### **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/<executable_name>_one_html/index.html` in a browser to display the HTML reports.
- XLSX reports are in file `exp_dir/RESULTS/<executable_name>_one_0_0.xlsx`
- The path to the reports is displayed at the end of ONE View analysis.

## Sample invocations of ONE View

- Command line on interactive MPI run

- Original line: `$ OMP_NUM_THREADS=2 mpirun -n 4 ./my_exe my_args`

- Corresponding ONE View invocation:

```
$ OMP_NUM_THREADS=2 maqao oneview -R1 --number-processes=4 \
--mpi-command="mpirun -n <number_processes>" \
--number-processes-per-node=2 -- ./my_exe my_args
```

- Command line for job scheduler script (script must be edited to replace original command line with keyword "`<run_command>`")

```
$ maqao oneview -R1 --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 -R1 --config=my_config.lua
```

- Compare existing ONE View reports

```
$ maqao oneview --compare-reports --inputs=exp_dir1,exp_dir2,...
```

## 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

- Analysing a given loop or set of loops

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

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

- 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