Tips and Tricks for CEP2 Custom Settings (v2.3.0)

This sheet describes options to minimize the impact of CEP2 on your computer while maximizing its scientific output. Results may vary for different hardware and WCG projects.

General customization options:
There are 3 places in which settings can be customized:

A) the Device Profile page on the WCG website
B) the BOINC Advanced View Preferences
C) the BOINC Simple View Preferences

We recommend custom settings in A as the most general case. They are forwarded to BOINC (e.g., by clearing B), but can be overwritten in B or C.

General setup strategies:

i) *idle only*, i.e., WCG runs only while your computer is truly idle
ii) *background*, i.e., WCG in addition also runs while you are working

For most users/hardware we recommend an idle only setup, which does not interfere with the user. It is usually more efficient and convenient to run at 100% while idle and 0% while busy instead of 40% at all times. The background mode can be useful for powerful computers which are only lightly used.

Settings (in prioritized order):

1) `Leave applications in memory while suspended? YES`

Explanation: CEP2 checkpointing is not very efficient; this powerful setting prevents loss of progress due to interruptions (except for reboots)

Exception: if computer has very little RAM (e.g., less than 1GB per core)

2) `Use no more than: 100% of processor time`

Explanation: WCG may as well use the full computer performance

Exception: if your computer (e.g., laptop) gets too hot

3) `On multiprocessors, use: 100% of processors`

Explanation: WCG may as well use the full computer capacity

Exception: hyper-threading gives virtual cores which, if fully loaded, can sometimes lead to decreased overall performance (compare wall-clock to cpu time); reduce to 50% to disengage hyper-threading or combine CEP2 with less demanding WCG projects (cf. item 4)

4) `Number of workunits per host for The Clean Energy Project - Phase 2: 4 (5,6,…)`

Explanation: many simultaneous CEP2 runs can lead to an I/O bottleneck which can clog up all runs and decrease the overall performance; we made good experience with 4 runs per hard-drive, but this is hardware dependent; remaining cores can be filled up with other less I/O intensive WCG projects

5) `Do work while computer is in use?  NO (YES)`

Explanation: NO for idle only use, YES for background use (see discussion above)

6) `Suspend work if CPU usage is above  50% (25%)`

Explanation: for idle only use: prevents impact on system tasks; for background use: frees up computer when user needs a certain degree of performance

(50% usually sufficient, 25% more conservative/user oriented; hardware/user dependent)

7) `Use no more than: 100% of memory while computer idle`

Explanation: for idle only use: WCG may as well use the full computer capacity

8) `Use no more than: 0% of virtual memory`

Explanation: virtual memory is extremely inefficient; if RAM is too small for CEP2, we recommend running a different WCG project

9) `Use no more than: 50% (75%) of memory while computer in use`

Explanation: for background use: makes sure that user does not run out of RAM

(50% usually sufficient, 75% for large RAM machines; 512MB free RAM left usually works well)

10) `Do work only after computer is idle for: 3 (5, 10,…) minutes`

Explanation: for idle only use: the lower the number, the sooner WCG starts crunching – but it should not impede the user

11) `Project Weight: 100.0`

Explanation: if you are a big WCG supporter

12) `Do work while computer is running on batteries? NO`

Explanation: you usually don't want to drain your laptop batteries running WCG

13) The Snooze/Pause button in the BOINC manager is great if during background use you temporarily want your computer all for yourself

Simply choose more conservative settings if your computer feels sluggish/unresponsive – don't leave WCG!

Best wishes,

Your Harvard CEP team

P.S.: We appreciate any feedback and thoughts you have about these suggestions.