

profiling

July 9, 2022

[1]: !lscpu

```
Architecture : x86_64
Mode(s) opératoire(s) des processeurs : 32-bit, 64-bit
Boutisme : Little Endian
Tailles des adresses: 43 bits physical, 48 bits virtual
Processeur(s) : 16
Liste de processeur(s) en ligne : 0-15
Thread(s) par cœur : 2
Cœur(s) par socket : 8
Socket(s) : 1
Nœud(s) NUMA : 1
Identifiant constructeur : AuthenticAMD
Famille de processeur : 23
Modèle : 49
Nom de modèle : AMD EPYC 7262 8-Core Processor
Révision : 0
Accroissement de fréquence : activé
Vitesse du processeur en MHz : 1485.871
Vitesse maximale du processeur en MHz : 3400,0000
Vitesse minimale du processeur en MHz : 1500,0000
BogoMIPS : 6399.96
Virtualisation : AMD-V
Cache L1d : 256 KiB
Cache L1i : 256 KiB
Cache L2 : 4 MiB
Cache L3 : 128 MiB
Nœud NUMA 0 de processeur(s) : 0-15
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass dis
abled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and
__user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional
, IBRS_FW, STIBP conditional, RSB fillin
```

Vulnerability Srbds:
Vulnerability Tsx async abort:
Drapeaux :

g
Not affected
Not affected
fpu vme de pse tsc msr pae mce cx8 apic
sep mtrr pge mca cmov pat pse36 clflush
mmx fxsr sse sse2 ht syscall nx mmxext f
xsr_opt pdpe1gb rdtscp lm constant_tsc r
ep_good nopl nonstop_tsc cpuid extd_apic
id aperfmperv pni pclmulqdq monitor ssse
3 fma cx16 sse4_1 sse4_2 movbe popcnt ae
s xsave avx f16c rdrand lahf_lm cmp_lega
cy svm extapic cr8_legacy abm sse4a misa
lignsse 3dnowprefetch osvw ibs skinit wd
t tce topoext perfctr_core perfctr_nb bp
ext perfctr_llc mwaitx cpb cat_l3 cdp_l3
hw_pstate sme ssbd mba sev ibrs ibpb st
ibp vmmcall sev_es fsgsbase bmi1 avx2 sm
ep bmi2 cqm rdt_a rdseed adx smap clflus
hopt clwb sha_ni xsaveopt xsavec xgetbv1
xsaves cqm_llc cqm_occup_llc cqm_mbm_to
tal cqm_mbm_local clzero irperf xsaveerp
tr rdpru wbnoinvd amd_ppin arat npt lbrv
svm_lock nrip_save tsc_scale vmcb_clean
flushbyasid decodeassists pausefilter p
fthreshold avic v_vmsave_vmload vgif uni
p rdpid overflow_recov succor smca

```
[2]: import sys
import os
os.environ['OMP_NUM_THREADS']="1"
import time
import numpy
import fabio
import pyFAI
from pyFAI.test.utilstest import UtilsTest
from pyFAI.gui import jupyter
import pyFAI.azimuthalIntegrator
pyFAI
```

```
[2]: <module 'pyFAI' from '/home/jerome/.venv/py39/lib/python3.9/site-
packages/pyFAI/__init__.py'>
```

```
[3]: img = fabio.open(UtilsTest.getimage("Pilatus6M.cbf")).data
ai = pyFAI.load(UtilsTest.getimage("Pilatus6M.poni"))
npt = 1000
split = "full"
method = [split, "csr", "cython"]
unit="r_mm"
```

```
ai
```

```
[3]: Detector Pilatus 6M      PixelSize= 1.720e-04, 1.720e-04 m  
Wavelength= 1.033200e-10m  
SampleDetDist= 3.000000e-01m  PONI= 2.254060e-01, 2.285880e-01m  
rot1=0.000000  rot2= 0.000000  rot3= 0.000000 rad  
DirectBeamDist= 300.000mm      Center: x=1329.000, y=1310.500 pix  
Tilt=0.000 deg  tiltPlanRotation= 0.000 deg
```

```
[4]: %timeit -o ai.integrate1d(img, npt, unit=unit, method=method)
```

```
176 ms ± 265 µs per loop (mean ± std. dev. of 7 runs, 1 loop each)
```

```
[4]: <TimeitResult : 176 ms ± 265 µs per loop (mean ± std. dev. of 7 runs, 1 loop  
each)>
```

```
[5]: %timeit -o ai.integrate1d(img, npt, unit=unit, method=(split, "csr", "python"))
```

```
157 ms ± 1.13 ms per loop (mean ± std. dev. of 7 runs, 10 loops each)
```

```
[5]: <TimeitResult : 157 ms ± 1.13 ms per loop (mean ± std. dev. of 7 runs, 10 loops  
each)>
```

```
[6]: from pyFAI.engines.CSR_engine import CSRIntegrator, CsrIntegrator1d
```

```
[7]: csr = [j for i, j in ai.engines.items() if i.implementation=="python"][0].engine
```

```
[8]: %timeit csr.integrate_ng(img)
```

```
154 ms ± 118 µs per loop (mean ± std. dev. of 7 runs, 10 loops each)
```

```
[9]: import copy  
csc = copy.deepcopy(csr)
```

```
[10]: csc._csr = csc._csr.tocsc()  
csc._csr2 = csc._csr2.tocsc()
```

```
[11]: %timeit csc.integrate_ng(img)
```

```
147 ms ± 701 µs per loop (mean ± std. dev. of 7 runs, 10 loops each)
```

```
[12]: %prun csc.integrate_ng(img)
```

```
118 function calls in 0.153 seconds
```

```
Ordered by: internal time
```

```
ncalls  tottime  percall  cumtime  percall  filename:lineno(function)
```

```

3      0.078    0.026    0.078    0.026 {built-in method scipy.sparse.
↳_sparsetools.csc_matvec}
1      0.068    0.068    0.146    0.146 CSR_engine.py:90(integrate)
1      0.007    0.007    0.153    0.153 CSR_engine.py:194(integrate)
3      0.000    0.000    0.078    0.026 _compressed.py:480(_mul_vector)
2      0.000    0.000    0.000    0.000 {method 'reduce' of 'numpy.ufunc'
↳objects}
1      0.000    0.000    0.153    0.153 {built-in method builtins.exec}
3      0.000    0.000    0.078    0.026 _base.py:400(dot)
6      0.000    0.000    0.000    0.000 numeric.py:1873(isscalar)
2      0.000    0.000    0.000    0.000 fromnumeric.py:69(_wrapreduction)
3      0.000    0.000    0.078    0.026 _base.py:510(_mul_dispatch)
3      0.000    0.000    0.078    0.026 _base.py:619(__matmul__)
17     0.000    0.000    0.000    0.000 {built-in method builtins.
↳isinstance}
3      0.000    0.000    0.000    0.000 {built-in method numpy.zeros}
2      0.000    0.000    0.000    0.000 <__array_function__ internals>:
↳177(prod)
1      0.000    0.000    0.000    0.000 <string>:1(<lambda>)
1      0.000    0.000    0.000    0.000 warnings.py:458(__enter__)
6      0.000    0.000    0.000    0.000 {built-in method _abc.
↳_abc_instancecheck}
1      0.000    0.000    0.000    0.000 warnings.py:181(_add_filter)
5      0.000    0.000    0.000    0.000 {built-in method builtins.getattr}
3      0.000    0.000    0.000    0.000 _sputils.py:193(isscalarlike)
3      0.000    0.000    0.000    0.000 _sputils.py:54(upcast_char)
2      0.000    0.000    0.000    0.000 fromnumeric.py:2927(prod)
1      0.000    0.000    0.000    0.000 {method 'remove' of 'list' objects}
6      0.000    0.000    0.000    0.000 abc.py:96(__instancecheck__)
1      0.000    0.000    0.000    0.000 warnings.py:437(__init__)
3      0.000    0.000    0.000    0.000 _sputils.py:250(isdense)
2      0.000    0.000    0.000    0.000 {built-in method numpy.core.
↳_multiarray_umath.implement_array_function}
3      0.000    0.000    0.000    0.000 _data.py:23(_get_dtype)
1      0.000    0.000    0.153    0.153 <string>:1(<module>)
1      0.000    0.000    0.000    0.000 warnings.py:165(simplefilter)
6      0.000    0.000    0.000    0.000 _base.py:119(get_shape)
3      0.000    0.000    0.000    0.000 {method 'get' of 'dict' objects}
1      0.000    0.000    0.000    0.000 containers.py:66(poissonian)
2      0.000    0.000    0.000    0.000 containers.py:50(parse)
1      0.000    0.000    0.000    0.000 {built-in method numpy.empty}
2      0.000    0.000    0.000    0.000 fromnumeric.py:70(<dictcomp>)
2      0.000    0.000    0.000    0.000 containers.py:70(do_variance)
1      0.000    0.000    0.000    0.000 warnings.py:477(__exit__)
1      0.000    0.000    0.000    0.000 {method 'insert' of 'list' objects}
1      0.000    0.000    0.000    0.000 {method 'disable' of '_lsprof.
↳Profiler' objects}

```

```

      2  0.000  0.000  0.000  0.000 fromnumeric.py:
↳_2922(_prod_dispatcher)
      2  0.000  0.000  0.000  0.000 {method 'items' of 'dict' objects}
      1  0.000  0.000  0.000  0.000 {built-in method __new__ of type
↳object at 0x906da0}
      3  0.000  0.000  0.000  0.000 {built-in method _warnings.
↳_filters_mutated}

```

```
[13]: %prun csr.integrate_ng(img)
```

118 function calls in 0.155 seconds

Ordered by: internal time

```

ncalls  tottime  percall  cumtime  percall  filename:lineno(function)
      3  0.085  0.028  0.085  0.028  {built-in method scipy.sparse.
↳_sparsetools.csr_matvec}
      1  0.063  0.063  0.148  0.148  CSR_engine.py:90(integrate)
      1  0.007  0.007  0.155  0.155  CSR_engine.py:194(integrate)
      3  0.000  0.000  0.085  0.028  _compressed.py:480(_mul_vector)
      2  0.000  0.000  0.000  0.000 {method 'reduce' of 'numpy.ufunc'
↳objects}
      1  0.000  0.000  0.155  0.155  {built-in method builtins.exec}
      3  0.000  0.000  0.085  0.028  _base.py:510(_mul_dispatch)
      3  0.000  0.000  0.085  0.028  _base.py:400(dot)
      2  0.000  0.000  0.000  0.000 fromnumeric.py:69(_wrapreduction)
      6  0.000  0.000  0.000  0.000 numeric.py:1873(isscalar)
     17  0.000  0.000  0.000  0.000 {built-in method builtins.
↳isinstance}
      3  0.000  0.000  0.000  0.000 {built-in method numpy.zeros}
      3  0.000  0.000  0.085  0.028  _base.py:619(__matmul__)
      1  0.000  0.000  0.000  0.000 warnings.py:458(__enter__)
      2  0.000  0.000  0.000  0.000 <__array_function__ internals>:
↳177(prod)
      1  0.000  0.000  0.000  0.000 warnings.py:181(_add_filter)
      1  0.000  0.000  0.000  0.000 <string>:1(<lambda>)
      6  0.000  0.000  0.000  0.000 {built-in method _abc.
↳_abc_instancecheck}
      3  0.000  0.000  0.000  0.000 _sputils.py:193(isscalarlike)
      5  0.000  0.000  0.000  0.000 {built-in method builtins.getattr}
      3  0.000  0.000  0.000  0.000 _sputils.py:54(upcast_char)
      2  0.000  0.000  0.000  0.000 fromnumeric.py:2927(prod)
      1  0.000  0.000  0.000  0.000 {method 'remove' of 'list' objects}
      1  0.000  0.000  0.000  0.000 warnings.py:437(__init__)
      3  0.000  0.000  0.000  0.000 _sputils.py:250(isdense)
      6  0.000  0.000  0.000  0.000 abc.py:96(__instancecheck__)

```

```

2    0.000    0.000    0.000    0.000 {built-in method numpy.core.
↳_multiarray_umath.implement_array_function}
3    0.000    0.000    0.000    0.000 _data.py:23(_get_dtype)
1    0.000    0.000    0.155    0.155 <string>:1(<module>)
1    0.000    0.000    0.000    0.000 warnings.py:165(simplefilter)
3    0.000    0.000    0.000    0.000 {method 'get' of 'dict' objects}
6    0.000    0.000    0.000    0.000 _base.py:119(get_shape)
1    0.000    0.000    0.000    0.000 {built-in method numpy.empty}
1    0.000    0.000    0.000    0.000 containers.py:66(poissonian)
2    0.000    0.000    0.000    0.000 containers.py:50(parse)
2    0.000    0.000    0.000    0.000 containers.py:70(do_variance)
2    0.000    0.000    0.000    0.000 fromnumeric.py:70(<dictcomp>)
1    0.000    0.000    0.000    0.000 warnings.py:477(__exit__)
1    0.000    0.000    0.000    0.000 {method 'disable' of '_lsprof.
↳Profiler' objects}
2    0.000    0.000    0.000    0.000 fromnumeric.py:
↳2922(_prod_dispatcher)
1    0.000    0.000    0.000    0.000 {method 'insert' of 'list' objects}
3    0.000    0.000    0.000    0.000 {built-in method _warnings.
↳_filters_mutated}
2    0.000    0.000    0.000    0.000 {method 'items' of 'dict' objects}
1    0.000    0.000    0.000    0.000 {built-in method __new__ of type
↳object at 0x906da0}

```

[]: