

Exemplo de utilização ompP no SeARCH

Os comandos e bibliotecas necessárias estão instalados em /share/apps/ompP

Programa `pi.c` em anexo

```
$ PATH=/share/apps/ompP/bin:$PATH

$ kinst-omp-papi gcc -DREAD_INPUT -fopenmp -std=gnu99 -o pi pi
$ ls

opari.rc      opari.tab.o  pi.4-0.ompp.txt  pi.c.opari.inc
opari.tab.c pi            pi.c             pi.mod.c

$ qsub -V -I -lnodes=1:ppn=4,walltime=00:12:00

qsub: job 104992.search6.di.uminho.pt ready

[amp@compute-541-25 ~]$

$ cd $PBS_O_WORKDIR

$ export OMPP_APPNAME=pi
$ export OMPP_OUTFORMAT=CSV

$ export OMP_NUM_THREADS=4

$ export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/share/apps/papi/5.3.2/lib/

[amp@compute-541-26 000]$ ./pi

Enter the number of intervals: 10000

pi is approximately = 3.14159265442312385375
Error               = 0.00000000083333073775
  wall clock time   = 0.01095123705454170704
Hello from thread 2
Hello from thread 0
Hello from thread 1
Hello from thread 3
sleep 3
sleep 2
sleep 1
sleep 0

[amp@compute-541-26 000]$ ls -l
total 252
.....
-rw-r--r-- 1 amp jade 8428 Nov 18 11:51 pi.4-0.ompp.txt
.....
```

Repetir a execução após efetuar:

```
$ export OMPP_CTR1=PAPI_TOT_INS
```


Conteúdo do Ficheiro pi.4-0.ompp.txt

```
-----  
-  
----      ompP General Information      -----  
-  
-----  
-  
Start Date       : Tue Nov 18 11:51:37 2014  
End Date         : Tue Nov 18 11:51:41 2014  
Duration         : 4.02 sec  
Application Name : pi  
Type of Report   : final  
User Time        : 0.82 sec  
System Time      : 0.00 sec  
Max Threads      : 4  
ompP Version     : 0.8.99  
ompP Build Date  : Nov 16 2014 11:48:14  
PAPI Support     : available  
Max Counters     : 4  
PAPI Active      : no  
Used Counters    : 0  
OMPP_CTR1       : not set  
OMPP_CTR2       : not set  
OMPP_CTR3       : not set  
OMPP_CTR4       : not set  
Max Evaluators   : 4  
Used Evaluators  : 0  
OMPP_EVAL1      : not set  
OMPP_EVAL2      : not set  
OMPP_EVAL3      : not set  
OMPP_EVAL4      : not set  
  
-----  
-  
----      ompP Region Overview      -----  
-  
-----  
-  
PARALLEL: 1 region:  
  * R00001 pi.c (59-69)  
  
PARALLEL LOOP: 1 region:  
  * R00005 pi.c (89-94)  
  
LOOP: 1 region:  
  * R00002 pi.c (61-63)  
  
USER REGION: 1 region:  
  * R00004 pi.c (76-78) ('foo')  
  
CRITICAL: 1 region:  
  * R00003 pi.c (64-67) (unnamed)
```

```

-----
-
----      ompP Callgraph      -----
-
-----
-

```

Inclusive (%)	Exclusive (%)		
4.02 (100.0%)	0.00 (0.01%)		[pi: 4 threads]
0.01 (0.34%)	0.01 (0.23%)	PARLOOP	-R00005 pi.c (89-94)
0.00 (0.11%)	0.00 (0.11%)	USERREG	+-R00004 pi.c (76-78)
('foo')			
4.00 (99.65%)	1.50 (37.37%)	PARALLEL	+-R00001 pi.c (59-69)
0.00 (0.001%)	0.00 (0.001%)	LOOP	-R00002 pi.c (61-63)
2.50 (62.28%)	2.50 (62.28%)	CRITICAL	+-R00003 pi.c (64-67)
(unnamed)			

```

-----
-
----      ompP Flat Region Profile (inclusive data)  -----
-
-----
-

```

R00005 pi.c (89-94) PARALLEL LOOP

TID	execT	execC	bodyT	exitBarT	startupT
shutdwnT	taskT				
0	0.01	1	0.01	0.00	0.00
0.00	0.00				
1	0.01	1	0.01	0.00	0.00
0.00	0.00				
2	0.01	1	0.01	0.00	0.00
0.00	0.00				
3	0.01	1	0.01	0.00	0.00
0.00	0.00				
SUM	0.05	4	0.05	0.00	0.00
0.00	0.00				

R00004 pi.c (76-78) ('foo') USER REGION

TID	execT	execC
0	0.01	2500
1	0.01	2500
2	0.01	2500
3	0.01	2500
SUM	0.02	10000

R00001 pi.c (59-69) PARALLEL

TID	execT	execC	bodyT	exitBarT	startupT
shutdwnT	taskT				
0	4.00	1	4.00	0.00	0.00
0.00	0.00				
1	4.00	1	3.00	1.00	0.00
0.00	0.00				
2	4.00	1	2.00	2.00	0.00
0.00	0.00				
3	4.00	1	1.00	3.00	0.00
0.00	0.00				
SUM	16.00	4	10.00	6.00	0.00
0.00	0.00				

```

R00002 pi.c (61-63) LOOP
  TID      execT      execC      bodyT      exitBarT      taskT
    0        0.00         1        0.00        0.00         0.00
    1        0.00         1        0.00        0.00         0.00
    2        0.00         1        0.00        0.00         0.00
    3        0.00         1        0.00        0.00         0.00
  SUM        0.00         4        0.00        0.00         0.00

```

```

R00003 pi.c (64-67) (unnamed) CRITICAL
  TID      execT      execC      bodyT      enterT      exitT
    0        4.00         1        1.00        3.00         0.00
    1        3.00         1        1.00        2.00         0.00
    2        2.00         1        1.00        1.00         0.00
    3        1.00         1        1.00        0.00         0.00
  SUM       10.00         4        4.00        6.00         0.00

```

```

-----
----      ompP Callgraph Region Profiles (incl./excl. data)      -----
-
-----

```

```

[*00] pi
[+01] R00005 pi.c (89-94) PARALLEL LOOP
  TID      execT      execC      bodyT/I      bodyT/E      exitBarT
startupT  shutdownT      taskT
    0        0.01         1         0.01         0.01         0.00
0.00      0.00         0.00
    1        0.01         1         0.01         0.01         0.00
0.00      0.00         0.00
    2        0.01         1         0.01         0.01         0.00
0.00      0.00         0.00
    3        0.01         1         0.01         0.01         0.00
0.00      0.00         0.00
  SUM        0.05         4         0.05         0.04         0.00
0.00      0.00         0.00

```

```

[*00] pi
[+01] R00005 pi.c (89-94) PARALLEL LOOP
[=02] R00004 pi.c (76-78) ('foo') USER REGION
  TID      execT/I      execT/E      execC
    0        0.00         0.00        2500
    1        0.00         0.00        2500
    2        0.00         0.00        2500
    3        0.00         0.00        2500
  SUM        0.02         0.02       10000

```

```

[*00] pi
[+01] R00001 pi.c (59-69) PARALLEL
  TID      execT      execC      bodyT/I      bodyT/E      exitBarT
startupT  shutdownT      taskT
    0        4.00         1         4.00         0.00         0.00
0.00      0.00         0.00
    1        4.00         1         3.00         0.00         1.00
0.00      0.00         0.00
    2        4.00         1         2.00         0.00         2.00
0.00      0.00         0.00
    3        4.00         1         1.00         0.00         3.00
0.00      0.00         0.00
  SUM       16.00         4        10.00         0.00         6.00
0.00      0.00         0.00

```

```

[*00] pi
[+01] R00001 pi.c (59-69) PARALLEL
[=02] R00002 pi.c (61-63) LOOP
  TID      execT      execC      bodyT/I      bodyT/E      exitBarT
taskT
  0        0.00        1          0.00         0.00         0.00
0.00
  1        0.00        1          0.00         0.00         0.00
0.00
  2        0.00        1          0.00         0.00         0.00
0.00
  3        0.00        1          0.00         0.00         0.00
0.00
  SUM      0.00        4          0.00         0.00         0.00
0.00

```

```

[*00] pi
[+01] R00001 pi.c (59-69) PARALLEL
[=02] R00003 pi.c (64-67) (unnamed) CRITICAL
  TID      execT      execC      bodyT/I      bodyT/E      enterT
exitT
  0        4.00        1          1.00         1.00         3.00
0.00
  1        3.00        1          1.00         1.00         2.00
0.00
  2        2.00        1          1.00         1.00         1.00
0.00
  3        1.00        1          1.00         1.00         0.00
0.00
  SUM     10.00        4          4.00         4.00         6.00
0.00

```

```

-----
-
----      ompP Overhead Analysis Report      -----
-
-----

```

```

Total runtime (wallclock)   : 4.02 sec [4 threads]
Number of parallel regions  : 2
Parallel coverage           : 4.01 sec (99.99%)

```

Parallel regions sorted by wallclock time:

(%)	Type	Location	Wallclock
R00001 (99.65)	PARALLEL	pi.c (59-69)	4.00
R00005 0.34)	PARLOOP	pi.c (89-94)	0.01 (
		SUM	4.01
(99.99)			

Overheads wrt. each individual parallel region:

	Total	Ovhds (%)	=	Synch (%)	+	Imbal (%)	+
Limpar (%)	+	Mgmt (%)					
R00001	16.00	12.00 (75.00)		6.00 (37.50)		6.00 (37.50)	
0.00 (0.00)		0.00 (0.00)					
R00005	0.05	0.00 (2.49)		0.00 (0.00)		0.00 (0.94)	
0.00 (0.00)		0.00 (1.55)					

Overheads wrt. whole program:

	Total	Ovhds (%)	=	Synch (%)	+	Imbal (%)	+
Limpar (%)	+	Mgmt (%)					
R00001	16.00	12.00 (74.74)		6.00 (37.37)		6.00 (37.37)	
0.00 (0.00)		0.00 (0.00)					
R00005	0.05	0.00 (0.01)		0.00 (0.00)		0.00 (0.00)	
0.00 (0.00)		0.00 (0.01)					
SUM	16.06	12.00 (74.75)		6.00 (37.37)		6.00 (37.37)	
0.00 (0.00)		0.00 (0.01)					