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<http://software.intel.com/en-us/articles/intel-parallelstudio>
(Show Me)

1		3
2	가?.....	3
3	가?	6
4	가?	9
5	?	11
6		13



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1-800-548-4725

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http://www.intel.com/products/processor_number

BunnyPeople, Celeron, Celeron Inside, Centrino, Centrino logo, Core Inside, FlashFile, i960, InstantIP, Intel, Intel logo, Intel386, Intel486, Intel740, IntelDX2, IntelDX4, IntelSX2, Intel Core, Intel Inside, Intel Inside logo, Intel. Leap ahead., Intel. Leap ahead., Intel NetBurst, Intel NetMerge, Intel NetStructure, Intel SingleDriver, Intel SpeedStep, Intel StrataFlash, Intel Viiv, Intel vPro, Intel XScale, IPLink, Itanium, Itanium Inside, MCS, MMX, Oplus, OverDrive, PDCharm, Pentium, Pentium Inside, skool, Sound Mark, The Journey Inside, VTune, Xeon Xeon Inside 가 Intel Corporation

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Microsoft

Microsoft Corporation

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1

- Microsoft* Visual Studio*
- 가
- :
1. Visual Studio (File) > (Open) > / (Project/Solution) <install_dir>\samples\matrix\matrix.vcproj
가 Visual Studio 가 (Solution Explorer)
 2. (Build) > (Build Solution)
matrix.exe

2

가?

<install_dir>/samples/matrix
가 ® 가 (Hotspot)
가
가

2.1



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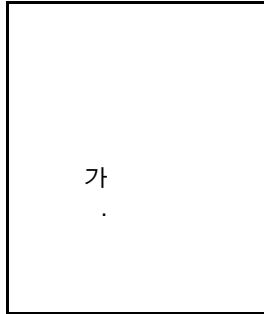
1. Visual Studio

가

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가

2.



가

```
C:\WINDOWS\system32\cmd.exe

C:\work\samples\matrix_AD\matrix\Debug>matrix.exe
Matrix transformation algorithms
Number of Threads = 1
Overall execution time =          21.31 secs
C:\work\samples\matrix_AD\matrix\Debug>_
```

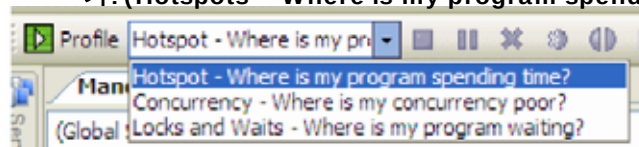
:

2.2

(/)

1.

가?(Hotspots – Where is my program spending time?)



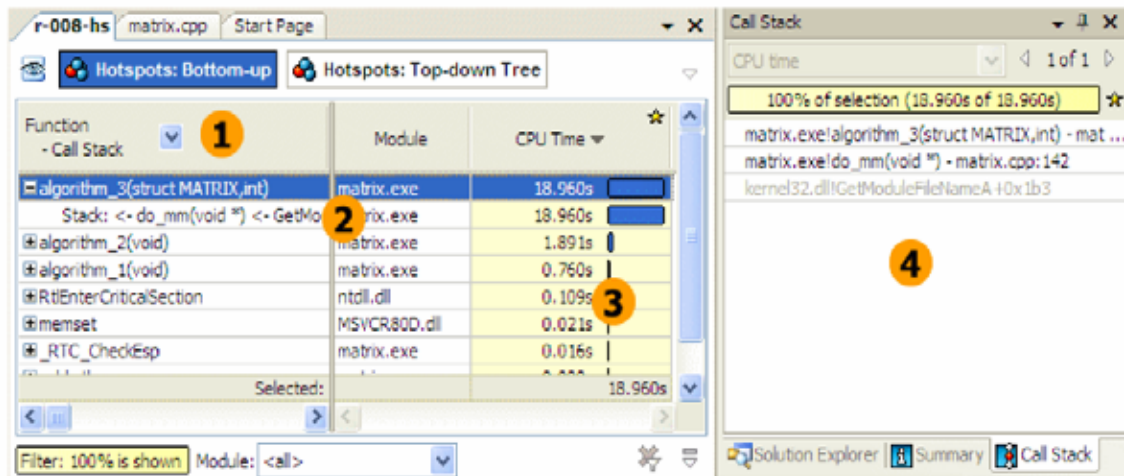
2.

(Profile)

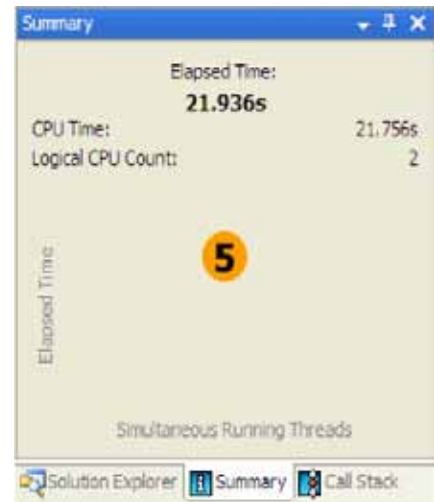


가

: (Hotspots: Bottom-up)



1	(Function - Call Stack)
2	(+)
3	CPU (CPU Time) (Data of Interest) CPU CPU 가
4	CPU
5	(Summary) CPU (CPU Time) CPU (Elapsed Time)



2.3

: (Hotspots: Bottom-up)
algorithm_3

가

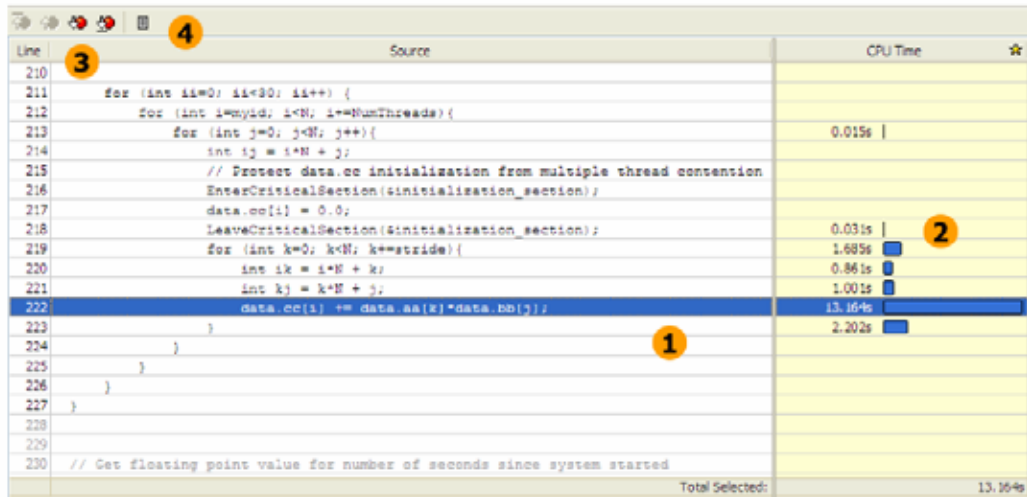
algorithm_3

222 가 가

CPU



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(Source)

1	가 CPU
2	
3	
4	

가

3

가?

(Concurrency)

가

가

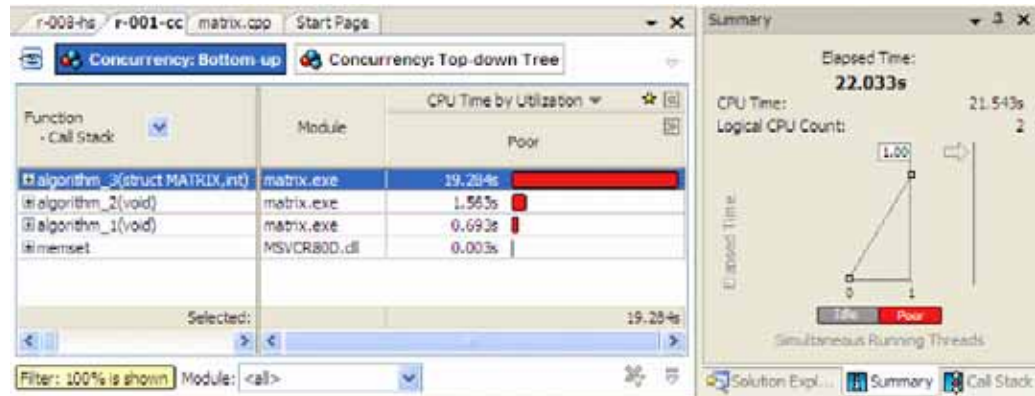


가?

3.1

가?(Concurrency – Where is my concurrency poor?)
(Profile)

(Concurrency)



(Concurrency)

(Summary)

가

CPU (CPU Time by Utilization)

가

(Summary)

0

1

CPU

: (Hotspots: Bottom-up)

가

algorithm_3

가

algorithm_3

가

3.2

1. Visual Studio matrix.cpp
2. 22 USE _MULTIPLE _THREADS TRUE
3. 23 USE _MULTIPLE _THREADS FALSE

가

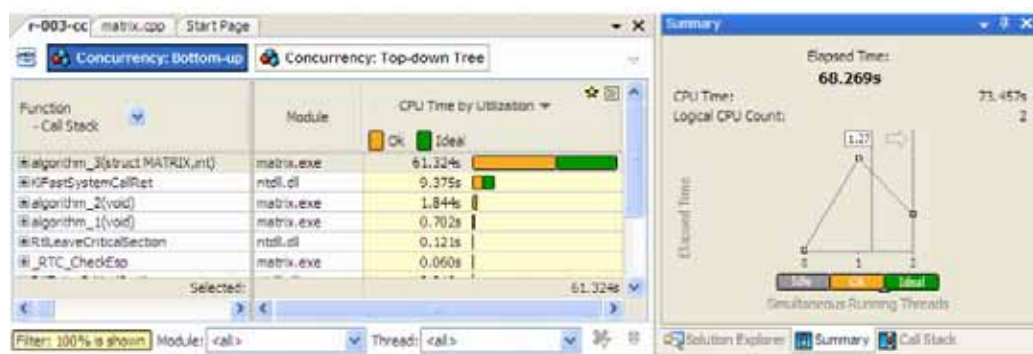
7



5. Visual Studio

3.4

21.31	14.01
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가?



algorithm _3 (CPU (CPU
Time Utilization) Ok).

:

가

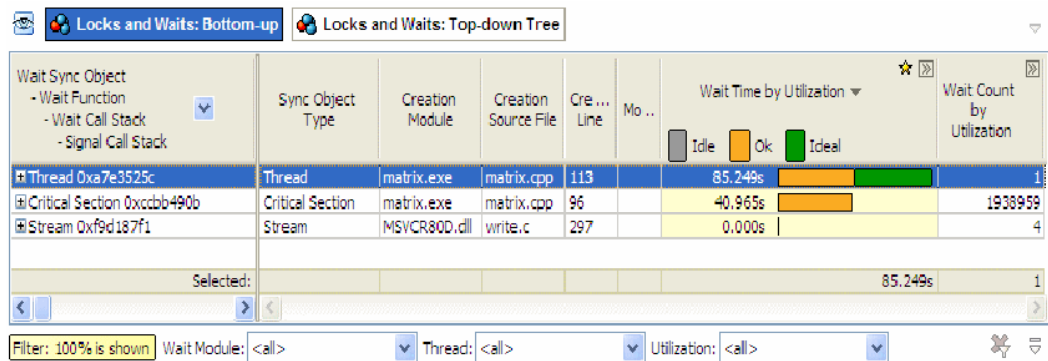
4

가?

algorithm_3 Ok CPU

4.1

가?(Locks and Waits – Where is my application
waiting?)
(Locks and Waits: Bottom-up)



가

가



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Line	Source	Wait Time by Utilization		Wait Count by Utilization
		Idle	Ok	Ideal
115	printf("CreateThread %d failed %d\n",myid[i],GetLastError());			
116	exit(1);			
117	}			
118	}			
119				
120	// Wait for all "algorithm_3" threads to finish			
121	int done = WaitForMultipleObjects(NumThreads, h, TRUE, INFINITE);	85.249s		85.2487
122				
123	// Display overall execution time			
124	double overall_end_time = GetSeconds();			
125	printf("Overall execution time = %10.2f secs\n",			
126	overall_end_time - overall_start_time);			
127				
128	DeleteCriticalSection (&initialization_section);			

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: (Locks and Waits: Bottom-up)
(Critical Section)

Line	Source	Wait Time by Utilization		Wait Count by Utilization
		Idle	Ok	Ideal
210				
211	for (int ii=0; ii<30; ii++) {			
212	for (int i=myid; i<N; i+=NumThreads){			
213	for (int j=0; j<N; j++){			
214	int ij = i*N + j;			
215	// Protect data.cc initialization from multiple threads			
216	EnterCriticalSection(&initialization_section);	40.965s		40.965
217	data.cc[i] = 0.0;			
218	LeaveCriticalSection(&initialization_section);			
219	for (int k=0; k<N; k+=stride){			
220	int ik = i*N + k;			
221	int kj = k*N + j;			
222	data.cc[i] += data.aa[k]*data.bb[j];			
223	}			

algorithm_3

data.cc[i] = 0 . 0; i i 가
for for
i for i+=NumThreads

?



4.2

Visual Studio 가 EnterCriticalSection (216)
LeaveCriticalSection (218)

4.3

matrix.exe

```
C:\WINDOWS\system32\cmd.exe

C:\work\samples\matrix_AD\matrix\Debug>matrix.exe
Matrix transformation algorithms
Using Multiple Threads
Number of Threads = 2
Overall execution time =           13.83 secs
C:\work\samples\matrix_AD\matrix\Debug>
```

14.01 13.83

5

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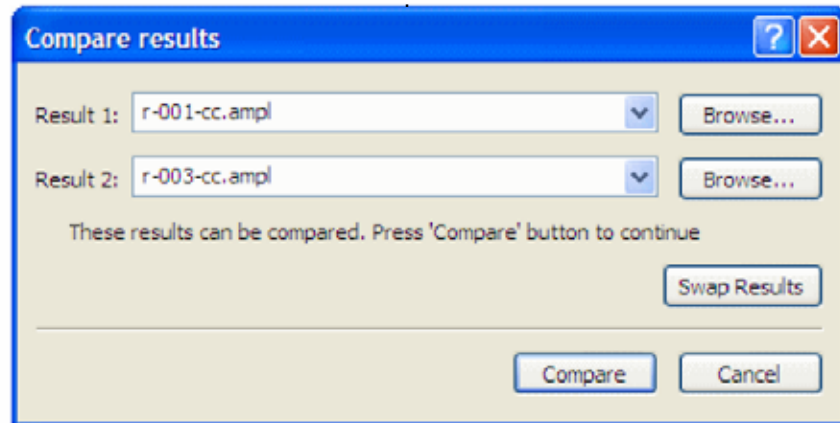
1.

2. **(Profile)**
 (Compare Results) 
 (Compare Results) 가

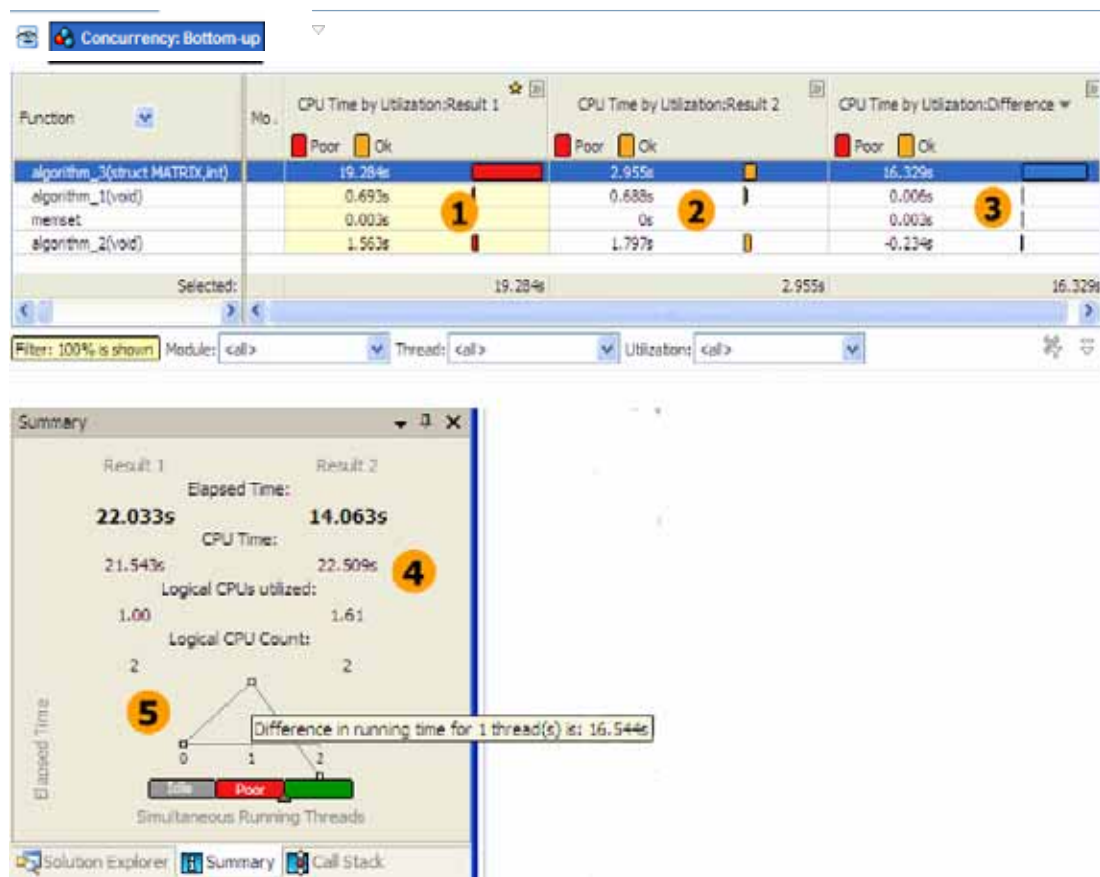


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3.



: (Concurrency: Bottom-up)





1	가 Poor matrix.exe CPU .
2	가 Ok matrix.exe CPU .
3	<CPU > = < 1 CPU > - < 2 CPU > CPU . , algorithm_3 2 CPU 16 .
4	. 2) CPU (CPU Time) : 1) (Elapsed Time) CPU (Logical CPUs utilized) CPU . 3) . 4) CPU (Logical CPU count) CPU .
5	(< 1 > - < 2 >)

matrix.exe (2)
(Ideal) (115%)
algorithm _3 16 .

6

가 ® .

®	Microsoft* Visual Studio* . Visual Studio (Help) (Intel Parallel Amplifier) > Parallel Amplifier Help) (Context- sensitive Help) F1 .
가	<installdir>\documentation\<locale> 가 . 가 가 가 Visual Studio (Help) (Intel Parallel Amplifier) > 가 (Sample Code Guide) .
	HTML ® HTML



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	Windows* Parallel Studio) > Parallel Amplifier) > (Intel Parallel Amplifier Documentation)	(Intel (Intel
®	® ● ® ● ® ● ® Studio) > > (Intel Parallel	가 가 C/C++