Intel® Trace Analyzer and Collector 9.0

A tool for distributed performance profiling

ITAC 9.0: What's New

- Collection
  - Full MPI-3 support
  - New mpirun options to customize collection
  - Experimental TIME-WINDOWS support
  - System calls profiling
- Analysis
  - New Performance Assistant
  - Visual appearance enhancement
  - New Summary Page
- New tutorials

MPI-3 support

Tracing of MPI calls that implement MPI-3 standard

- Non-blocking collectives
- RMA (Remote Memory Access) API

New mpirun data collection keys

Reduce a trace file size or a number of Message Checker reports (supported only at runtime with Hydra process manager):

- `-trace-collectives`: collect info only about Collective operations
- `-trace-pt2pt`: collect info only about Point-to-Point operations

Example:

```
$ [mpirun|mpiexec] -trace-pt2pt -n 4 ./myApp
```

TIME-WINDOWS support (Experimental)

Aimed to reduce amount of collected data by limiting time when events are collected and, subsequently, trace size.

Set up a time frame for trace collection using any of the following:

- `TIME-WINDOWS` option for ITC configuration file
- `VT_TIME_WINDOWS` environment variable

Example:

```
TIME-WINDOWS 0:1,10:20
```

System calls profiling (1|2)

Linux* only. Capability to trace the following system calls:

access	clearerr	close	creat
dup	dup2	fclose	fdopen
feof	ferror	fflush	fgetc
fgetpos	fgets	fileno	fopen
fprintf	fputc	fputs	fread
freopen	fseek	fsetpos	ftell
fwrite	getc	getchar	gets
lseek	lseek64	mkfifo	perror
pipe	poll	printf	putc
putchar	puts	read	readv
remove	rename	rewind	setbuf
setvbuf	sync	tmpfile	tmpnam
umask	ungetc	vfprintf	vprintf
write	writev		

System calls profiling (2|2)

To turn on system calls collection add any of the following lines into ITC configuration file:

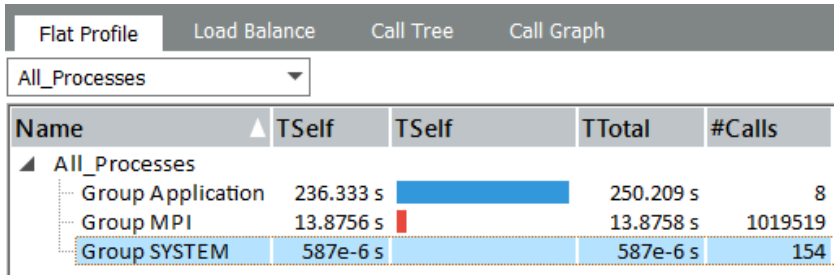
- To collect all system calls:

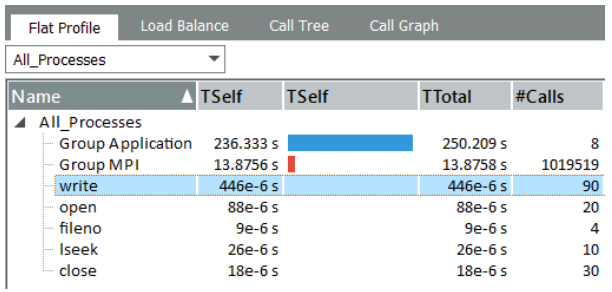
```
ACTIVITY SYSTEM on
```

- To collect an exact function:

```
STATE SYSTEM:<func_name> ON
```

View system calls using ITA (new Group SYSTEM, can be expanded in an ordinary way):

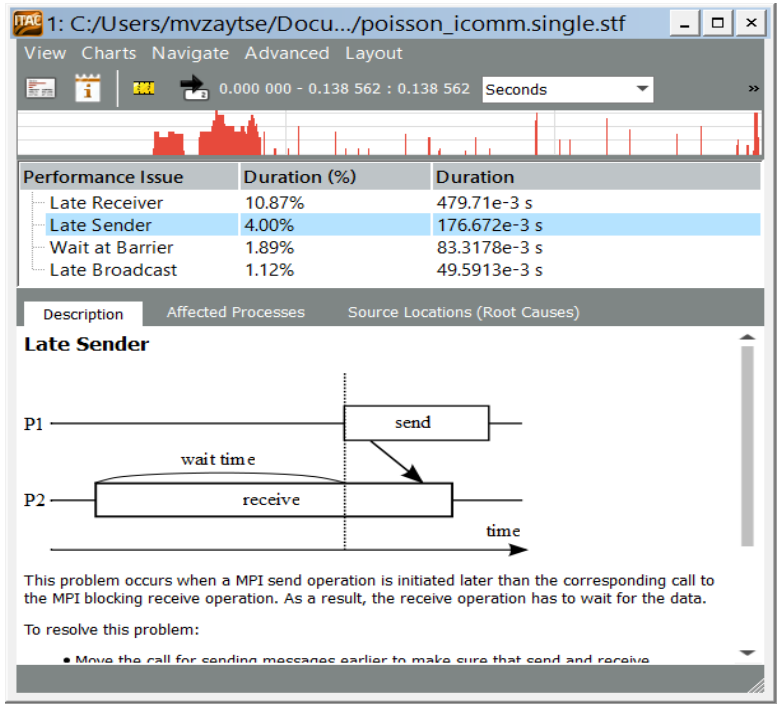




New Performance Assistant

Automatic highlights of performance issues, both in GUI and CLI.

Currently 4 types of issues are supported, see screenshots:




```
nnlmpicl409$ traceanalyzer --cli --assist poisson_icomm.single.stf

>>>>> Welcome to the Intel(R) Trace Analyzer command line interface. <<<<

TraceFile::request: 0 - 18446744073709551615 - 18446744073709551615 - 18446744073709551615
With STF profiles

Analysing...
Done.

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PERFORMANCE ISSUE: Late Sender
DESCRIPTION: This problem occurs when a MPI send operation is initiated later than
             the corresponding call to the MPI blocking receive operation.
             As a result, the receive operation has to wait for the data.
             To resolve this problem:
               - Move the call for sending messages earlier to make sure that send
                 and receive operations happen at approximately the same time. This
                 can be done by lessening the computation prior to the send function
                 call or by adding computation prior to the receive function call.
               - Use non-blocking receive functions (MPI_Irecv).
AFFECTED PROCESSES:
   <Process #>        <Duration %> <Duration ticks>    <Duration s>
    TOTAL                  4.02 %         88336124       0.08834 s
    Process         4      0.5328 %        11708396       0.01171 s
    Process        10      0.4774 %        10489993       0.01049 s
    Process        12      0.4683 %        10291442       0.01029 s
    Process         2      0.4478 %         9840164       0.00984 s
    Process         0      0.4153 %         9126236      0.009126 s
    Process         8      0.3934 %         8644838      0.008645 s
    Process        14      0.3929 %         8634122      0.008634 s
    Process         6      0.3834 %         8425262      0.008425 s
    Process         5      0.1428 %         3137778      0.003138 s
    Process        13      0.1389 %         3052146      0.003052 s
    Process         9     0.08717 %         1915665      0.001916 s
    Process        15     0.06338 %         1392744      0.001393 s
    Process         1     0.04604 %         1011637      0.001012 s
    Process        11     0.01342 %          294877     0.0002949 s
    Process         7     0.01207 %          265325     0.0002653 s
    Process         3    0.004801 %          105499     0.0001055 s
SOURCE LOCATION:
   <Source:Line>      <Duration %> <Duration ticks>    <Duration s>
    pardat.f90:225         2.809 %         61739023       0.06174 s
```
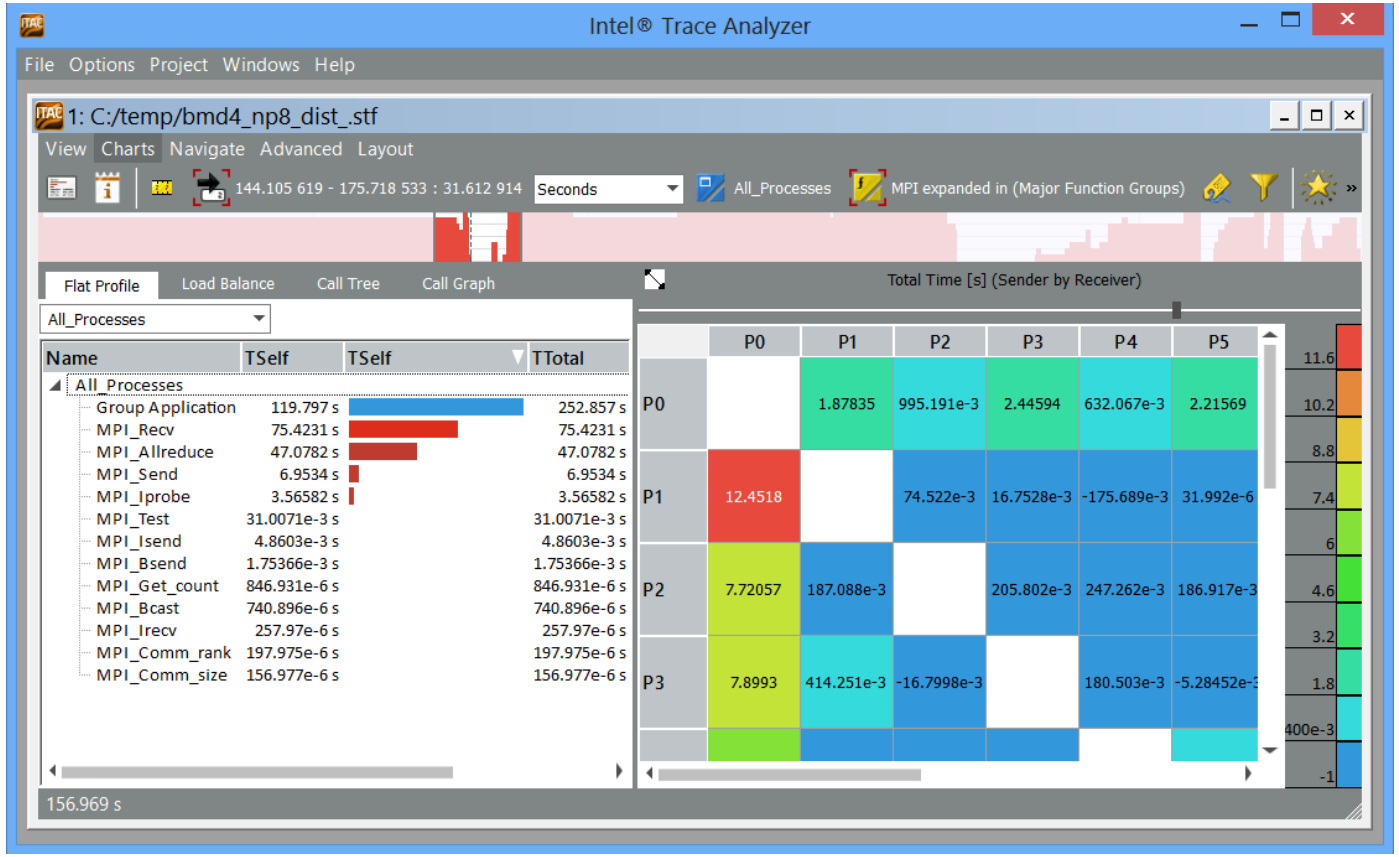
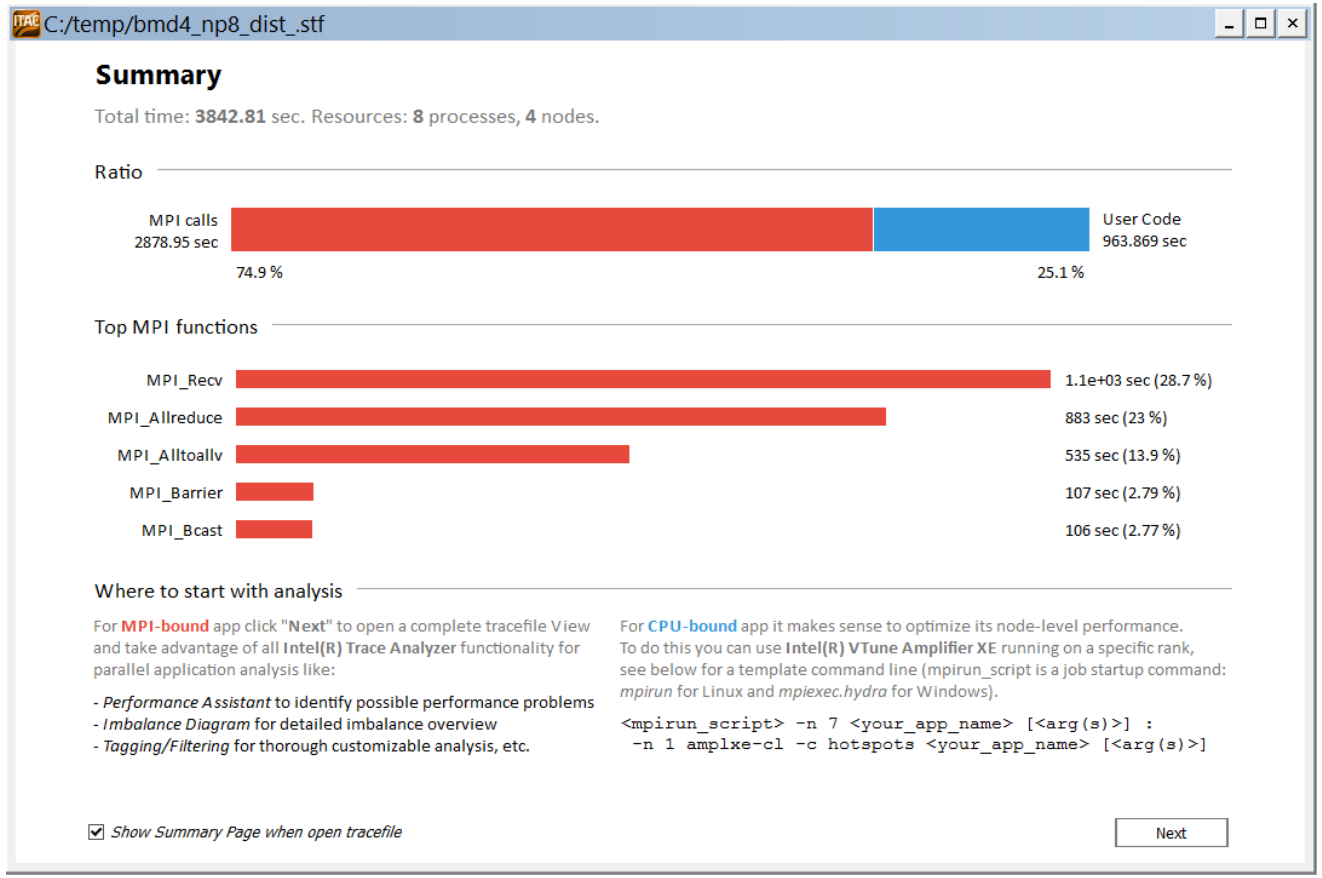

Visual appearance enhancement

New default fonts and color scheme, new style for standard controls as scroll bar, buttons, check boxes, combo boxes etc.



New Summary Page

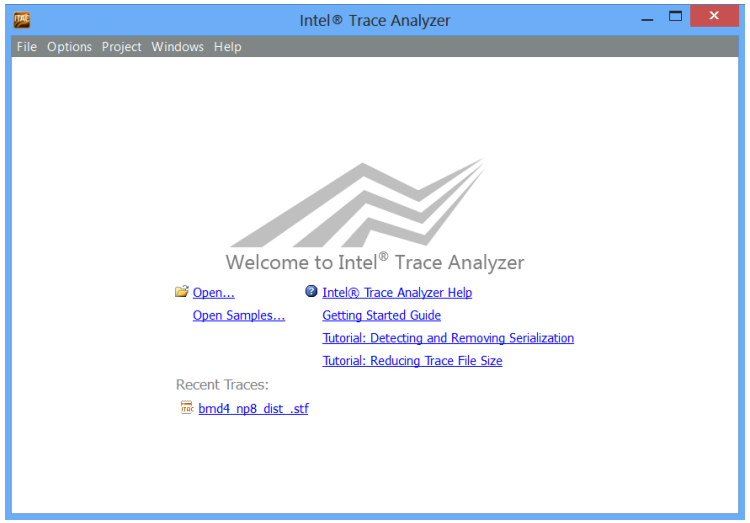
At-a-glance view on MPI activity and hints on how to start the analysis of the application:

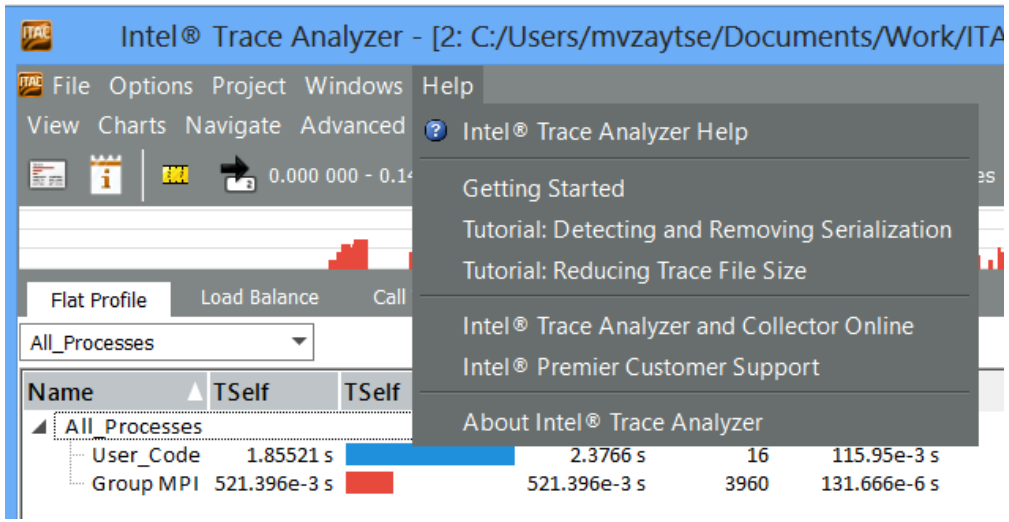


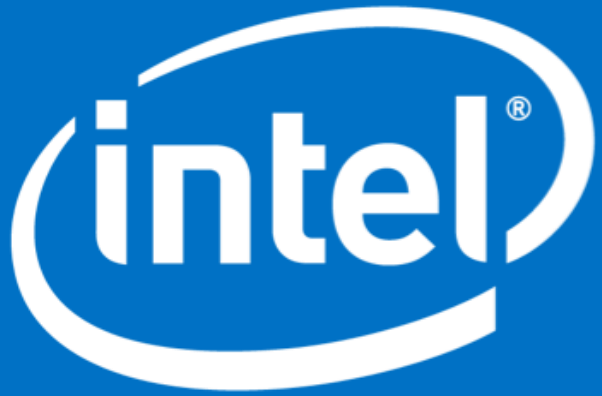
New tutorials

- Tutorial: Detecting and Removing Serialization
- Tutorial: Reducing Trace File Size

Available both from Welcome Page and Help-menu:



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