

MPI-Tracing on Windows

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Agenda

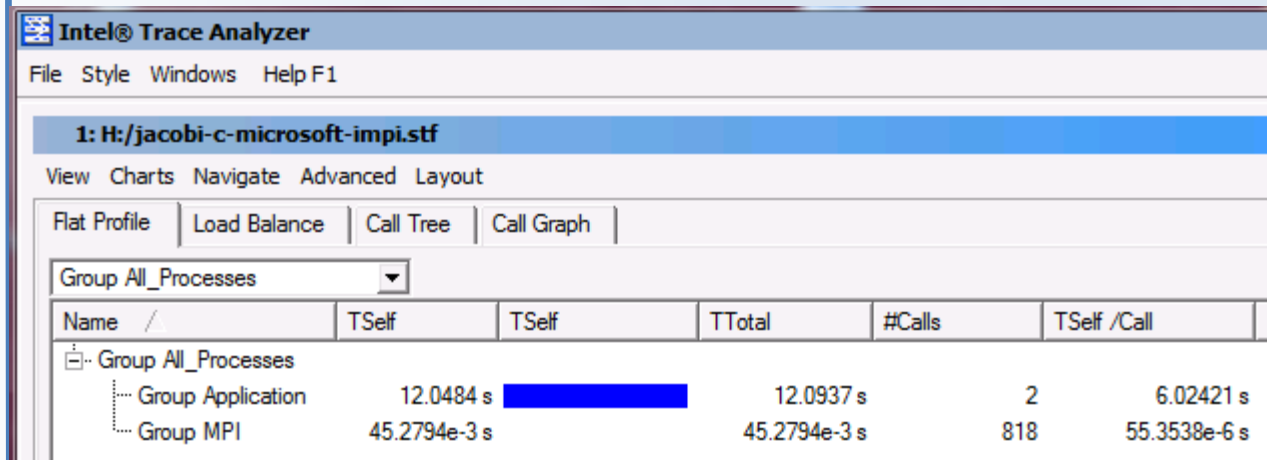
- Intel Trace Analyzer and Collector
- MS-MPI + Event Tracing for Windows
- Epilog4Win



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Intel Trace Analyzer & Collector Overview

- MPI analysis tool available on Windows
 - Low-overhead, event-based Tracing
 - Profiling of message-passing (and multi-threading) applications



- Get overview or detailed MPI profile information

Name /	TSelf	TSelf	TTotal
Group All_Processes			
Group Application	401.022e-3 s		401.604e-3 s
MPI_Isend	106.298e-6 s		106.298e-6 s
MPI_Irecv	47.6318e-6 s		47.6318e-6 s
MPI_Waitall	188.362e-6 s		188.362e-6 s
MPI_Allreduce	238.997e-6 s		238.997e-6 s

Intel Trace Analyzer and Collector: Usage

- Usage instructions:
 - Link with `VT.lib` from `C:\Program Files (x86)\Intel\ICT\3.1\ITAC\7.1\lib\#arch`, `arch` is either `impi32` (32bit) or `impi64` (64bit)
 - Initialize environment with `C:\Program Files (x86)\Intel\ICT\3.1\ITAC\7.1\bin\itacvars.bat`, then execute program as usually (specify working directory)
 - A trace file named `#executable.stf` is written along with other data files. Open in Intel Trace Analyzer from Start → All Programs → Intel Software Development Tools → Intel Trace Analyzer and Collector 7.1

Demo

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MS-MPI Tracing Overview

- Bundled with MS-MPI comes a tracing provider for ETL
 - ETL: Event tracing for Windows
 - Just add a switch to mpiexec
- No native GUI for ETL-based MPI analysis (yet), but:
 - Converter to OTF format: Use Vampir GUI
 - Vampir GUI on Windows is in beta, available on `cluster-win-beta`
 - Vampir GUI on Linux can be used as well
 - Converter to CLOG format: Use JumpShot

MS-MPI Tracing: Usage

- Add option `-t` or `-trace` with optional argument *filter*:
 - all = (api + interconn), or any combination of
 - api: Trace MPI api events, can be limited to: pt2pt, poll, coll, rma, comm, errh, group, attr, dtype, io, topo, init, info, misc
 - interconn: Trace Interconnect-specific event, can be limited to: icsock, icshm, icnd
- Add option `-tracefile` *filename* to set trace name:
 - Default is `%USERPROFILE%\mpi_trace.el`
 - `_%CCP_JOBID%.%CCP_TASKID%.%CCP_TASKINSTANCEID%` is appended to default name
- After tracing a clock synchronization is necessary:
 - `mpiexec -core 1 mpicsync trace.etl`

Demo

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Epilog4Win: Usage

1. Download the code package from http://icl.cs.utk.edu/projectsfiles/kojak/software/kojak/win_epilog.zip - will be available in *Shared_Software* share shortly
 2. Link your application with `epilog.lib` instead of `msmpi.lib`
 3. When executing your application, put `epilog.dll` and `elg_merge.exe` in path
- Access the resulting `a.elg` trace file from Unix and use the tool of your choice:
 - First Expert and then Cube: Search for inefficiency patterns
 - `module load VIHPS scalasca`
 - `expert a.elg; cube a.cube;`
 - First `elg2vtf` and then Vampir: Visual Message Trace

The End

Thank you for your attention!

Questions?

