OTF Tools

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Introduction

The Open Trace Format Library (OTF) comes with support tools that perform frequent tasks.

otfmerge: Change the number of streams for an existing OTF trace.

otfaux: Append snapshot and statistics information to an existing OTF trace.

vtf2otf: Convert VTF3 trace files to OTF format.

otf2vtf: Convert OTF trace files to VTF format. (limited functionality).

otfprint: Convert an OTF trace or parts of it into a human readable, long version.

otfcompress: Compression program for single OTF files.

otfconfig: Show parameters of the OTF configuration.

otfprofile: Generate a profile of an OTF trace in LaTeX format.

otfshrink: Create a new OTF trace that only includes specified processes.

otfinfo: Program to get basic information of an OTF trace.

For all OTF tools the `-V` option will print the OTF version. See below for detailed description of each tool.

otfmerge

The **otfmerge[-mpi]** tool allows to merge an existing OTF trace to a different number of streams. The `-n` option specifies the number of output streams. At maximum there will be as many output streams as there are trace processes. Setting `-n 0` will create the maximum number of streams automatically.

The output file name is set via the `-o` option. With `-f` it is possible to restrict the number of file handles used concurrently by `otfmerge[-mpi]`. This is necessary if the number of files exceeds the limit of file handles as set by the environment.

Via `-rb` and `-wb` the internal input resp. output buffer sizes per stream can be changed. However, the default buffer sizes should be suitable most of the time. The `-stats` and `-snaps` options allow to include statistics and snapshot records when merging. By default they are ignored.

Global definition records are copied to the output trace. Local definitions are also copied even though this is invalidates the trace! Local definitions are not expected and should have been translated to global definitions beforehand by the resp. creator.

The following short help message is given when `otfmerge[-mpi]` is called with the `-h` option:

```
otfmerge[-mpi] - Change the number of streams for an
                 existing OTF trace.

Syntax: otfmerge[-mpi] [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -p            show progress
     -n <n>        set number of streams for output
                   set this to 0 for using one
                   stream per process
                   (default: 1)
     -f <n>        max. number of filehandles
                   available per rank
     -o <name>     namestub of the output file
                   (default: out)
```

```
-rb <size>    set buffersize of the reader
              (for each rank)
-wb <size>    set buffersize of the writer
              (for each rank)
-z <zlevel>   write compressed output
              zlevel reaches from 0 to 9 where
              0 is no compression and 9 is the
              highest level
--stats       cover statistics too
--snaps       cover snapshots too
--long        write long OTF format
```

otfaux

The `otfaux` tool appends auxiliary information to an existing OTF trace. The event records are read but not modified.

There are two kinds of auxiliary data. First, there are snapshot information that provide the complete status of a trace process at a given time stamp. This contains call stack information, pending messages, current performance counter values, etc. Second, there are statistics information accumulated from the beginning of the trace until the current time stamp. Statistics involve the number of calls, exclusive and inclusive time for per function resp. function group or accumulated message count and message volume for communication, etc. Statistics are always monotone increasing not unlike program profiles. Let S_a and S_b two statistics at time stamps $a < b$ then $S := S_b - S_a$ is the profile information for the time interval $[a, b]$.

Both, snapshots and statistics are generated at certain break point, which can be specified in several ways: First, `-n x` allows to have `x` break points distributed regularly over the trace's time interval. Second, `-p y` will generate a break point every `y` ticks starting from the beginning of the trace. If both options are given the one producing more break points wins. In addition break points can be specified with `-t z` which will add a single explicit break point regardless of`-n` and `-p` options.

If the `-g` switch is set then function statistics are replaced by function group statistics. This produces more terse output. The option `-v` switches on verbose mode which prints break point time stamps while processing.

In case there are auxiliary information already present the `-o` option forces otfaux to overwrite it. Otherwise otfaux exits with an error message. Via `-b` internal buffer size per stream can be adjusted although the default setting is suitable most of the time.

The `-h` switch provides the following short help message:

```
otfaux - Append snapshots and statistics to an
         existing OTF trace at given 'break'
         time stamps.

Syntax: otfaux [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -b <size>     buffer size for read and write
                   operations
     -n <n>        number of breaks
                   (distributed regularly)
                   if -p and -t are not set, the
                   default for -n is 200 breaks
     -p <p>        create break every 'p' ticks
                   (if both, -n and -p are specified
                   the one producing more breaks wins)
     -t <t>        define (additional) break at given
                   time stamp
     -F            force overwrite old snapshots and
                   statistics
     -R            delete existing snapshots and
                   statistics only
     -f <n>        max number of filehandles output
     --funcgroups  create functiongroup summaries
                   instead of function summaries
     --filegroups  create file group summaries instead
                   of file summaries
     -v            verbose mode, print break
                   time stamps
     -a            show advancing progress during
                   operation
```

```
   --snapshots   write ONLY snapshots but NO
                 statistics
   --statistics  write ONLY statistics but NO
                 snapshots

   -s a[,b]*     regard given streams only when
                 computing statistics.
                 expects a single token or comma
                 separated list.
                 this implies the '--statistics'
                 option!
   -l            list existing stream tokens
```

vtf2otf

The `vtf2otf` tool translates a VTF3 trace to OTF. With `-o` the output file name is specified. If it has no '.otf' suffix already then it is appended automatically. This tool supports only those record types supported by OTF. Some deprecated or experimental VTF3 records are ignored.

The number of output streams to be generated is given with `-n n`. The `-f` option allows to restrict the number of file handles to be opened concurrently in case there are too many streams. Again, `-b` adjusts the output buffer size per stream if the default is not suitable. If the `-h` switch is set the following help message is provided:

```
vtf2otf - Convert VTF3 trace files to OTF format.

Syntax: vtf2otf [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -o <file>     output file
     -f <n>        max count of filehandles
     -n <n>        output stream count
     -b <n>        size of the writer buffer
```

```
   -z <n>          use zlib compression
   -io             compute io events. This is
                   neccessary for getting correct
                   durations in IO-operations.
                   Result of this step is a file with
                   extra information. This file is
                   used for creating correct duration-
                   information in a normal run.
                   If you do not have these extra
                   -information-file, the duration of
                   every IO-operation will be zero.
```

otf2vtf

The `otf2vtf` tool performs the backward transformation from OTF to VTF3. Again, `-o` gives the VTF3 output file name including file suffix. Via `-b` OTF's input buffer size per stream can be adjusted if necessary.

With `-A` resp. `-B` the VTF3 sub-format can be set to ASCII (default) resp. binary. The `-h` switch produces a short help message like follows:

```
otf2vtf - Convert OTF trace files to VTF3 format.

Syntax: otf2vtf [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -o <file>     output file
     -b <n>        size of the reader buffer
     -A            write VTF3 ASCII sub-format
                   (default)
     -B            write VTF3 binary sub-format
```

otfprint

(since version 1.12.3; previously named `otfdump`)

The `otfprint` tool prints information about a tracefile in human readable format.

```
otfprint - Convert an OTF trace or parts of it into a
           human readable, long version.

Syntax: otfprint [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -f <n>        set max number of filehandles
                   available
                   (default: 50)
     -o <file>     output file
                   if the ouput file is unspecified
                   the stdout will be used

     --num <a> <b> output only records no. [a,b]
     --time <a> <b>
                   output only records with
                   time stamp in [a,b]

     --nodef       omit definition records
     --noevent     omit event records
     --nostat      omit statistic records
     --nosnap      omit snapshot records
     --nomarker    omit marker records

     --nokeyvalue  omit key-value pairs
     --fullkeyvalue
                   show key-value pairs including the
                   contents of byte-arrays

     --procs <a>   show only processes <a>
                   <a> is a space-seperated list of
```

```
                process-tokens
    --records <a> show only records <a>
                <a> is a space-seperated list of
                record-type-numbers
                record-type-numbers can be found in
                OTF_Definitions.h (OTF_*_RECORD)

    -s, --silent  do not display anything except the
                time otfprint needed to read the
                tracefile
```

otfcompress

The `otfcompress` tool performs compression and decompression on traces.

```
otf(de)compress - Compression program for single
                  OTF files.

Syntax: otf(de)compress [options] <file(s)>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -c            compress (default action if
                   called as 'otfcompress')
     -d            decompress (default action if
                   called as 'otfdecompress')
     -k            keep original file
                   (compressed resp. uncompressed)
     -o <dir>      output directory
                   (implicitly sets -k)
     -[0-9]        use given compression level
                   (default 4)
                   0 - plain
                   1 - minimum compression, fastest
                   9 - maximum compression, slowest
```

otfconfig

The `otfconfig` tool shows various installation parameters of OTF, which are important for developers.

```
otfconfig - Show parameters of the OTF configuration.

Syntax: otfconfig [options]

  options:
     -h, --help    show this help message
     -V, --version show OTF version
     --have-zlib   is zlib enabled
     --have-zoidfs is ZOIDFS for IOFSL enabled
     --includes    path to the otf headers
     --libs        libline needed for linking otf
     --sizes       print size of integer types
```

otfprofile

The `otfprofile[-mpi]` tool creates a concise profile of an OTF trace in Latex format.

```
otfprofile[-mpi] - generate a profile of a trace in
                   LaTeX format.

Syntax: otfprofile[-mpi] -i <input file name> [options]

  options:
     -h, --help    show this help message
     -V            show OTF version
     -v            increase output verbosity
                   (can be used more than once)
     -i <file>     specify the input trace name
     -p            show progress
     -f <n>        max. number of filehandles
```

```
               available per rank
               (default: 50)
-b <size>      set buffersize of the reader
               (default: 1048576)
-o <prefix>    specify the prefix of output file(s)
               (default: result)
-g <n>         max. number of process groups in
               LaTeX output
               (range: 1-16, default: 16)
-c, --cluster do additional clustering of
               processes/threads
--cluster-alg <alg>
               set comparison algorithm for clustering
               to "KMEANS" or "CLINKAGE"
               (default: KMEANS)
-s <prefix>    call otfshrink to apply the cluster
               mapping to input trace and produce a
               new trace named <prefix> with symbolic
               links to the original (implies -c)
-H             use hard groups for CLINKAGE
               clustering
               (implies --cluster-alg CLINKAGE)
-q <0-1>       quality threshold for CLINKAGE
               clustering
               (implies --cluster-alg CLINKAGE,
                default: 0.1)
-d, --disp <options>
               do additional analysis of irregularities
               using various output options to be
               specified in a comma-separated list
               possible values are:
                 filter  create VampirTrace filter rules
                         from analysis information,
                 info    add information of
                         irregularities to PDF output,
                 marker  add marker information to
                         trace file
               (implies --tex, default: info)
--disp-mode <mode>
               set profiling level within the analysis to
               "per-function" or "per-call-path"
```

```
                (default: per-function)
    --disp-reduction <percentage>
                set percentage of call-paths
                to be filtered.
                (default: 15)
    --disp-filter <file>
                name of the previous filter file that
                will be added to the new filter file
    -M, --csv-msg-matrix
                write communication matrix in CSV file
                (implies --csv)
    -S, --csv-msg-size
                write message length statistics in CSV file
                (implies --csv)
    --stat      read only summarized information,
                no events
    --[no]csv   enable/disable producing CSV output
                (default: disabled)
    --[no]tex   enable/disable producing LaTeX output
                (default: enabled)
    --[no]pdf   enable/disable producing PDF output
                (implies --tex if enabled,
                 default: enabled)

PDF creation requires the PGFPLOTS package version >1.4
http://sourceforge.net/projects/pgfplots/
```

otfshrink

The `otfshrink` tool creates a new otf file that is reduced to specified processes.

```
otfshrink - Create a new OTF trace that only includes
            specified processes.

Syntax: otfshrink [options] -i <file>

  options:
```

```
      -h, --help    show this help message
      -V            show OTF version
      -i <file>     input file name
      -o <name>     namestub of the output file
                    (default: out)
      -l "<list>"   a list of processes in quotes
                    to enable, i.e. keep in the copy,
                    e.g. '-l "1,2 4-8 3",10 12-20'
      -v            invert setting from '-l',
                    i.e. deactivate/exclude listed
                    processes
      -m "<list>"   map all listed processes to one
                    representative and remove all
                    remaining ones
                    must not be mixed with '-l' and '-v'
      -f <file>     read multiple '-m' lists from
                    the given file
                    one list/group per line, empty
                    lines allowed
      -k            do not remove processes which have
                    a representative
                    only valid in combination with
                    '-m' or '-f'
      -s <mode>     simulation mode: display all
                    selected processes, no files are
                    created,
                    (display modes: (l)ist, (r)ange, or
                    (t)able, defaut: range)
      -p <file>     displays all processes with name
                    and id input file without ".otf"

 Multiple instances of '-l', '-m', and '-f' may be used.
```

otfinfo

The `otfinfo` tool is useful to get basic information about a tracefile.

```
otfinfo - Program to get basic information of an
          OTF trace.

Syntax: otfinfo [options] <input file name>

  options:
     -h, --help    show this help message
     -V            show OTF version
     -f <n>        set max number of filehandles
                   available
     -l <ilevel>   set the information level for
                   the output
                   (0 - 4, default: 1)
     -a            set the information level to 4
     -p            show progress bar for reading
                   event files
```