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 trace.

otfaux: add snapshot and statistics information to an otf trace.

vtf2otf: translate VTF3 traces to OTF.

otf2vtf: translate OTF to VTF3 backwards (limited functionality).

otfdump: print information about a tracefile in human readable format.

otfcompress: compress/decompress OTF traces.

otfconfig: show configure parameters for the existing OTF installation.

otfprofile: generate concise profile in Latex format for an OTF trace.

otfshrink: create a new otf file that only includes specified processes.

otfinfo: get basic information about a tracefile.

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 differ-
ent 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 neces-
sary if the number of files exceeds the limit of file handles as set by the environ-
ment.

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 expect-
ed 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 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 pro
                           (default: 1)
     -f <n>                max. number of filehandles available per r
     -o <name>             namestub of the output file
                           (default: out)
     -rb <size>            set buffersize of the reader (for each ran
     -wb <size>            set buffersize of the writer (for each ran
     -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 existing
          otf traces at given 'break' time stamps

otfaux [Options] <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
```

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```
                            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.

 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 VTF format.

 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
```

otfdump

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

```
 otfdump - convert otf traces or parts of it into a
           human readable, long version

   Options:
     -h, --help     show this help message
```

```
-V              show OTF version
-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 otfdump needed to read
                the tracefile
```

otfcompress

The otfcompress tool performs compression and decompression on traces.

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

  Usage: otf(de)compress [OPTIONS] <FILES>

    -h, --help   show this help message
    -V           show OTF version
    -c           compress (default action when 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.

```
otf-config - shows parameters of the otf configuration.

otf-config [Options]

  Options:
    -h, --help   show this help message
    --version    show the otf version
    --have-zlib  is zlib 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] [options] <input file name>

  options:
    -h, --help           show this help message
    -V                   show OTF version
    -v                   increase output verbosity
                         (can be used more than once)
    -p                   show progress
    -f <n>               max. number of filehandles available per
                         (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 out
                         (range: 1-16, default: 16)
    -c, --cluster[ <alg>]
                         do additional clustering of processes/thre
                         comparison algorithm <alg> (KMEANS or CLIN
                         (default comparison algorithm: KMEANS)
    -m <mapfile>         write cluster mapping to <mapfile>
                         (implies -c, default: result.map)
    -s <prefix>          call otfshrink to apply the cluster mappin
                         input trace and produce a new trace named
                         with symbolic links to the original (impli
    -H                   use hard groups for CLINKAGE clustering
                         (implies --cluster CLINKAGE)
    -q <0-1>             quality threshold for CLINKAGE clustering
                         (implies --cluster CLINKAGE, default: 0.1)
    --stat               read only summarized information, no event
    --[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: enable

 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 - creates a new otf file that only includes
             specified processes

  options:
     -h, --help     show this help message
     -V             show OTF version
     -i <file>      specify the input trace file
     -o <file>      specify the output file
     -l "<list>"    a space-separated list of processes in quotes
                    to enable, i.e. keep in the copy,
                    e.g. '-l "1 2 3 4 8 5"'
     -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
     -s <mode>      simulation mode: display all selected
                    processes, no files are created,
                    display modes: (l)ist, (r)ange or (t)able
                    defaut: range

   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 a trace.

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) the default level is 1
    -a            set the information level to 4
    -p            show progress bar for reading
                  event files
```