

NAME

hwloc-distrib – Build a number of cpu masks distributed on the system

SYNOPSIS

hwloc-distrib [*options*] <integer>

OPTIONS**--single**

Singlify each output to a single CPU.

--taskset

Show CPU set strings in the format recognized by the taskset command-line program instead of hwloc-specific CPU set string format.

-v --verbose

Verbose messages.

-i <file>, --input <file>

Read topology from XML file <file> (instead of discovering the topology on the local machine). If <file> is "-", the standard input is used. XML support must have been compiled in to hwloc for this option to be usable.

-i <directory>, --input <directory>

Read topology from <directory> instead of discovering the topology of the local machine. On Linux, the directory may contain the topology files gathered from another machine topology with hwloc-gather-topology. On x86, the directory may contain a cpuid dump gathered with hwloc-gather-cpuid.

-i <specification>, --input <specification>

Simulate a fake hierarchy (instead of discovering the topology on the local machine). If <specification> is "node:2 pu:3", the topology will contain two NUMA nodes with 3 processing units in each of them. The <specification> string must end with a number of PUs.

--if <format>, --input-format <format>

Enforce the input in the given format, among **xml**, **fsroot**, **cpuid** and **synthetic**.

--ignore <type>

Ignore all objects of type <type> in the topology.

--from <type>

Distribute starting from objects of the given type instead of from the top of the topology hierarchy, i.e. ignoring the structure given by objects above.

<type> cannot be among NUMANode, I/O or Misc types.

--to <type>

Distribute down to objects of the given type instead of down to the bottom of the topology hierarchy, i.e. ignoring the structure given by objects below. This may be useful if some latitude is desired for the binding, e.g. just bind several processes to each package without specifying a single core for each of them.

<type> cannot be among NUMANode, I/O or Misc types.

--at <type>

Distribute among objects of the given type. This is equivalent to specifying both **--from** and **--to** at the same time.

--reverse

Distribute by starting with the last objects first, and singlify CPU sets by keeping the last bit (instead of the first bit).

- restrict** <cpuset>
Restrict the topology to the given cpuset.
- restrict** nodeset=<nodeset>
Restrict the topology to the given nodeset, unless **--restrict-flags** specifies something different.
- restrict-flags** <flags>
Enforce flags when restricting the topology. Flags may be given as numeric values or as a comma-separated list of flag names that are passed to *hwloc_topology_restrict()*. Those names may be substrings of actual flag names as long as a single one matches, for instance **bynodeset,memless**. The default is **0** (or **none**).
- disallowed**
Include objects disallowed by administrative limitations.
- version**
Report version and exit.
- h --help**
Display help message and exit.

DESCRIPTION

hwloc-distrib generates a series of CPU masks corresponding to a distribution of a given number of elements over the topology of the machine. The distribution is done recursively from the top of the hierarchy (or from the level specified by option **--from**) down to the bottom of the hierarchy (or down to the level specified by option **--to**, or until only one element remains), splitting the number of elements at each encountered hierarchy level not ignored by options **--ignore**.

This can e.g. be used to distribute a set of processes hierarchically according to the topology of a machine. These masks can be used with hwloc-bind(1).

NOTE: It is highly recommended that you read the hwloc(7) overview page before reading this man page. Most of the concepts described in hwloc(7) directly apply to the hwloc-bind utility.

EXAMPLES

hwloc-distrib's operation is best described through several examples.

If 4 processes have to be distributed across a machine, their CPU masks may be obtained with:

```
$ hwloc-distrib 4
0x0000000f
0x00000f00
0x000000f0
0x0000f000
```

To distribute only among the second package, the topology should be restricted:

```
$ hwloc-distrib --restrict $(hwloc-calc package:1) 4
0x00000010
0x00000020
0x00000040
0x00000080
```

To get a single processor of each CPU masks (prevent migration in case of binding)

```
$ hwloc-distrib 4 --single
0x00000001
0x00000100
0x00000010
0x00001000
```

Each output line may be converted independently with hwloc-calc:

```
$ hwloc-distrib 4 --single | hwloc-calc --taskset  
0x1  
0x100  
0x10  
0x1000
```

To convert the output into a list of processors that may be passed to dplace -c inside a mpirun command line:

```
$ hwloc-distrib 4 --single | xargs hwloc-calc --pulist  
0,8,4,16
```

RETURN VALUE

Upon successful execution, hwloc-distrib displays one or more CPU mask strings. The return value is 0.

hwloc-distrib will return nonzero if any kind of error occurs, such as (but not limited to) failure to parse the command line.

SEE ALSO

hwloc(7)