

## Requirement Expression Syntax

The syntax of the requirement expressions is defined as:

```
stmt ::= expr
expr ::= VARIABLE '=' INTEGER
      | VARIABLE '>' INTEGER
      | VARIABLE '<' INTEGER
      | VARIABLE '=' STRING
      | expr '&' expr
      | expr '|' expr
      | '!' expr
      | '(' expr ')'
```

Each expression is evaluated to 1 (TRUE) or 0 (FALSE). Only those hosts for which the requirement expression is evaluated to TRUE will be considered to execute the job.

Logical operators are as expected (less '<', greater '>', '&' AND, '|' OR, '!' NOT), '=' means equals with integers. When you use '=' operator with strings, it performs a shell wildcard pattern matching.

Examples:

```
REQUIREMENTS = 'LRMS_TYPE = "pbs"' # Only use pbs
REQUIREMENTS = 'HOSTNAME = "*.es"' # Only hosts ending in ".es"
REQUIREMENTS = 'HOSTNAME = "mycomputer"' # Only use mycomputer
REQUIREMENTS = 'ARCH = "x86_64"' # Only host x86_64 architecture
REQUIREMENTS = 'ARCH = "x86_64" & HOSTNAME = "*.es"' # Only hosts ending in ".es" and have x86_64 architecture
```

You can check the resources size that match your requirements with `wrf4g_resources -m GW_identification`.

```
[user@mycomputer~]$ wrf4g_status -l
Realization   GW Stat Chunks Comp.Res  WN      Run.Sta      ext   %
test          0   R  1/3   mycomputer  ciclon   WRF          -  0.00
[user@mycomputer~]$ wrf4g_resources -m 0
HID QNAME      RANK  PRI  SLOTS HOSTNAME
0  default     0     1    0     mycomputer
```

## Requirement Variables

If you want to see more information about a single resource, use the `wrf4g_resources` command followed by the host identification (HID):

```
[user@mycomputer~]$ wrf4g_resources
HID PRI OS          ARCH  NODES(U/F/T) LRMS      HOSTNAME
0  1  GNU/Linux2.6.18 x86_64  0/1/1  FORK      mycomputer
[user@mycomputer~]$ wrf4g_resources 0
HID PRI OS          ARCH  NODES(U/F/T) LRMS      HOSTNAME  QUEUENAME      SL(F/T) WALLT  CPURT  COUNT  MAXR  MAXQ
0  1  GNU/Linux2.6.18 x86_64  0/1/1  FORK      mycomputer  default        1/1  0     0     0     0     0
```

The REQUIREMENTS values are:

Variable	Description
HOSTNAME	Execution host (e.g. mycomputer)
ARCH	Architecture of the execution host (e.g. i686, x86_64)
OS_NAME	Operating System name of the execution host (e.g. Linux, S5)
OS_VERSION	Operating System version of the execution host (e.g. 2.6.9-166.3)
CPU_MODEL	CPU model of the execution host (e.g. Intel(R) Pentium(R) 4 CPU 2.00)
CPU_FREQ	CPU speed in MHz of the execution host
CPU_FREQ%	Percentage of host CPU of the execution host
NODECOUNT	Total number of cores of the execution host
SIZE_MEM_MIB	Total memory size in MIB of the execution host
FREE_MEM_MIB	Free memory in MIB of the execution host
SIZE_DISK_MIB	Total disk space in MIB of the execution host
FREE_DISK_MIB	Free disk space in MIB of the execution host
LRMS_TYPE	Type of local DDM system for execution (e.g. pbs, rge)
QUEUE_NAME	Name of the queue (e.g. default, short)
QUEUE_NODECOUNT	Total node count of the queue
QUEUE_FREENODECOUNT	Free node count of the queue
QUEUE_MAXTIME	Maximum wall time of jobs in the queue
QUEUE_MAXCPUUSAGE	Maximum CPU time of jobs in the queue
QUEUE_MAXCOUNT	Maximum count of jobs that can be submitted in one request to the queue
QUEUE_MAXRUNNINGJOBS	Maximum number of running jobs in the queue
QUEUE_MAXQUEUEDJOBS	Maximum number of queued jobs in the queue
QUEUE_DISKCAPTYPE	Quota type of the queue (e.g. best, immediate)
QUEUE_PRIORITY	Priority of the queue
QUEUE_STATUS	Status of the queue (e.g. active, production)

## Environment Expression Syntax

The syntax of the environment expressions is specified in a comma-separated, source/destination pair.

```
stmt ::= VARIABLE = VALUE, VARIABLE = VALUE, ...
```

Examples:

```
ENVIRONMENT = 'WALLTIME = 00:01:00' # 60 seconds of max walltime
ENVIRONMENT = 'WALLTIME = 00:01:00, MEMORY = 2000' # 60 seconds of max walltime and 2 GB of RAM memory
```

## Environment Variables

The variables defined in the ENVIRONMENT are:

Variable	Description
PPN	Specify the number of processors per node requested for the job.
CPUTIME	Maximum amount of CPU time used by all processes in the job ( <b>HH:MM:SS</b> )
WALLTIME	Maximum amount of real time during which the job can be in the running state ( <b>HH:MM:SS</b> )
MEMORY	Maximum amount of physical memory used by the job ( <b>MB</b> )