Timing Tools

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We’ll review the following timers

For cpu time:
  - etime
  - dtime

For wall clock time:
  - time
  - walltime
Use of the etime function

A section of code can be timed using etime. It returns the elapsed cpu time in seconds since program start.

```fortran
real*4 tarray(2), time1, time2, timeres

... beginning of program ...

time1 = etime(tarray)
do i = 1,1000
  ... lots of computation ...
enddo

time2 = etime(tarray)
timeres = time2 - time1
```
A section of code can also be timed using dtimes. It returns the elapsed cpu time in seconds since the last call to dtimes.

```
real*4 tarray(2),timeres
...beginning of program ...
timeres=dtimes(tarray)
do i=1,1000
...lots of computation...
enddo
timeres=dtimes(tarray)
```
Description of etime/dtime

User time
This is returned as the first element of tarray
It is the cpu time spent executing user code

System time
This is returned as the second element of tarray
It is the time spent executing system calls on behalf of your program

Sum of user and system time
This is the function value that is returned
It is the time that you usually want to report
Description of etime/dtime (Cont.)

Metric

Timings are reported in seconds
Timings are accurate to 1/100th of a second

Availability

The functions etime and dtime are available on the Exemplar, Power Challenge and Origin computers
Timer Differences

For the Power Challenge and Origin computers:

et ime and dt ime return the MAX time over all threads for a parallel program
It is the time of the longest thread, which is usually the master thread

For the Exemplar computer

et ime and dt ime return the SUM of the time over all threads for a parallel program
Use of the time function

The function \texttt{time} returns the time since 00:00:00 GMT, Jan. 1, 1970 in seconds. It's a means of getting the elapsed wall clock time.

\begin{verbatim}
real*4 time1,time2,timeres
    time1=time( )
    ... lots of computation ...
    time2=time( )
    timeres=time2- time1
\end{verbatim}

This function is available on the Exemplar, Power Challenge and Origin computers.
Use of the \texttt{walltime} function

The function \texttt{walltime} returns the total amount of wallclock time since program startup minus the argument passed to \texttt{walltime}.

\begin{verbatim}
real*4 wall1,timeres
wall1=walltime(0.0)
...lots of computation...
timeres=walltime(wall1)
\end{verbatim}

This function is only available on the Exemplar computer.