Orchestrating a brighter world

NEC

Routines to Get Time and Clock

1st Edition, June 2020

Orchestrating a brighter world

NEC creates the social values of
safety, security, fairness and efficiency
to promote a more sustainable world
where everyone has the chance to reach
their full potential.

This document provides the list of routines to get time and clock, and how they get them, in C/C++ and Fortran.

C/C++

HW Counter	Using Quick Call	Normal
omp_get_wtime() MPI_Wtime()	clock_gettime(*id*) *id* : CLOCK_REALTIME CLOCK_REALTIME_COARSE CLOCK_MONOTONIC CLOCK_MONOTONIC_COARSE CLOCK_MONOTONIC_RAW CLOCK_BOOTTIME CLOCK_THREAD_CPUTIME_ID gettimeofday()	clock_gettime(*id*) *id* : CLOCK_PROCESS_CPUTIME_ID Returned by pthread_getcpuclockid() or clock_getcpuclockid() getrusage() clock() time()

HW Counter

Routines directly refer to special HW counters in VE. Any system calls are not invoked.

Using Quick Call

Routines invoke system calls at the first time only. They do not invoke any system calls at the next time.

Note: Refer to https://www.hpc.nec/forums/topic?id=Lb2cNR for the detail.

Normal

Routines invoke system calls.

Fortran

HW Counter	Using Quick Call	Normal
D = OMP_GET_WTIME() D = MPI_WTIME()	CALL DATE_AND_TIME(DATE) CALL DATE_AND_TIME(TIME) CALL DATE_AND_TIME(VALUE) CALL SYSTEM_CLOCK(COUNT) ✓ COUNT_RATE,COUNT_MAX do not require any system calls.	CALL CPU_TIME(TIME) CALL DATE_AND_TIME(ZONE)
CALL CLOCK(D or Q) CALL ETIME(D)	R = SECNDS(R)	A24 = CTIME(I) CALL DATE(A8) CALL DATIM(A8, R or A8, I) R = DTIME(R(2)) R = ETIME(R(2)) A24 = FDATE() CALL FDATE(A24) CALL GMTIME(I, I(9)) CALL IDATE(I(3)) CALL ITIME(I(3)) CALL LTIME(I, I(9)) R = TIME() CALL TIME(A8)

R : Default REAL
D : Double precision REAL
Q : Quadruple precision REAL
I : Default INTEGER
A*n*: CHARACTER(LEN=*n*)
(*n*): Array, *n* is number of elements

- Routines in upper row are defined by Fortran, OpenMP, MPI standards. Routines in lower row are NEC-specific or defined in other compilers.


Orchestrating a brighter world
NEC