

Z01ABFP

NAG Parallel Library Routine Document

Note: Before using this routine, please read the Users' Note for your implementation to check for implementation-dependent details.

1 Description

Z01ABFP undefines a logical processor grid which has been initialized by a call to Z01AAFP, and invalidates the BLACS context (see [1]) for that grid. Options are provided to enable the user to reshape the grid using a further call to Z01AAFP or to terminate the NAG Parallel Library mechanism, in which case no further calls to routines from the NAG Parallel Library can be made.

1.1 PVM-based Version

Z01ABFP must not be used to undefine logical processor grids that have not been created by Z01AAFP. Consequently, it is the user's responsibility to ensure that logical processors created by any other mechanism, e.g. PVMFSPAWN, are terminated correctly (by a call to BLACS_EXIT and any system dependent exiting routines)

1.2 MPI-based Version

Z01ABFP may be used to undefine logical processor grids that have not been created by Z01AAFP.

2 Specification

```
SUBROUTINE Z01ABFP(ICNTXT, CONT, IFAIL)
  INTEGER          ICNTXT, IFAIL
  CHARACTER*1      CONT
```

3 Data Distribution

3.1 Definitions

None.

3.2 Global and Local Arguments

The input arguments CONT and IFAIL are global and so must have the same value on entry to the routine on each processor. The output argument IFAIL is global and so will have the same value on exit from the routine on each processor.

4 Arguments

- 1: ICNTXT — INTEGER *Local Input*
On entry: the BLACS context used by the communication mechanism, usually returned by a call to Z01AAFP.
- 2: CONT — CHARACTER*1 *Global Input*
On entry: indicates whether further communication is to take place:
 if CONT = 'Y' then further message passing is expected – the grid context is undefined but the BLACS are still available and Z01AAFP may be called to re-initialise the logical processor grid;

if `CONT = 'N'` then further calls to NAG Parallel Library routines are not permitted. In the PVM-based version of the Library if the user has employed the NAG mechanism for creating processes then Z01ABFP calls `BLACS_EXIT`; otherwise it is the user's responsibility to terminate the logical processors. However, in the MPI-based version, Z01ABFP may be employed to undefine the logical processor grid.

Constraint: `CONT = 'Y'` or `'N'`.

3: IFAIL — INTEGER

Global Input/Global Output

On entry: IFAIL must be set to 0, -1 or 1. For users not familiar with this parameter (described in the Essential Introduction) the recommended values are:

IFAIL = 0, if multigriding is **not** employed;

IFAIL = -1, if multigriding is employed.

On exit: IFAIL = 0 unless the routine detects an error (see Section 5).

5 Errors and Warnings

If on entry IFAIL = 0 or -1, explanatory error messages are output from the root processor (or processor {0,0} when the root processor is not available) on the current error message unit (as defined by X04AAF).

Errors detected by the routine:

IFAIL = -2000

The routine has been called with an invalid value of ICNTXT on one or more processors.

IFAIL = -1000

The logical processor grid and library mechanism (Library Grid) have not been correctly defined, see Z01AAFP.

IFAIL = -2

The global input argument, CONT, did not have one of the values 'Y' or 'N', or did not have the same value on all processors. The error message distinguishes between these two cases.

6 Further Comments

Note: A call to Z01ABFP is a **synchronisation point** which involves **all** processors. The user should choose when to call Z01ABFP carefully in a multigrid program to avoid the possibility of some processors sitting idle.

7 References

- [1] Dongarra J J and Whaley R C (1995) A users' guide to the BLACS v1.0. *LAPACK Working Note 94 (Technical Report CS-95-281)* Department of Computer Science, University of Tennessee, 107 Ayres Hall, Knoxville, TN 37996-1301, USA.
URL: <http://www.netlib.org/lapack/lawns/lawn94.ps>