

# MPMD with Coarray Fortran: TS 18508 Events - Example Program

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<https://github.com/MichaelSiehl/MPMD-with-Coarray-Fortran-TS-18508-Events-Example-Program>

May 2016 (160530)

## TS-18508 Events – Example Program

Our original example program did use Fortran 2008 language elements exclusively to accomplish a MPMD-like programming style. Nevertheless, OpenCoarrays/GFortran [1] does already support TS-18508 *Events*, a fairly flexible one-sided synchronization mechanism. We did modify our example program only slightly to try out this new feature successfully. The modifications are:

- The `Ilimma_SYNC_CheckActivityFlag` routine of our purely local ImageManager Abstract Data Type (ADT) does use the `EVENT WAIT` statement by now.
- The `Ilinma_ActivateTeamManagerImage` routine of our purely local InitialManager ADT does use the `EVENT POST` statement by now.
- Also, the `Iitema_ActivateTeamMemberImage` routine of our purely local TeamManager ADT does use the `EVENT POST` statement by now.
- We use the specification part of our `OOOPimsc_admImageStatus_CA` standalone coarray wrapper to declare the required `EVENT_TYPE` coarray object. (We did not try out another way, but assume that coarrays of `EVENT_TYPE` do also require coarray correspondence to successfully establish a remote communication channel. Thus, we do access that coarray by `USE` association exclusively.)

Compared to the original example program, the compilation process itself is unaffected by these modifications. No changes or further commands are required with OpenCoarrays/GFortran. Execution of the program, using TS-18508 *Events*, does give the same results as our original version did.

Initially, we did also develop another very simple example program to try out TS-18508 *Events*, shown below:

```
program event_example
  use iso_fortran_env
  implicit none
  type(event_type) :: ev[*]
  integer :: a [*]
  integer :: b
  if (this_image() == 1) then
    event wait (ev)
    b = a[2]
    write(*,*) "image 1, b ==", b
  elseif (this_image() == 2) then
    write(*,*) "image 2"
    a = 77
    event post (ev[1])
  end if
end program event_example
```

## References

[1] Fanfarillo, A., Burnus, T., Cardellini, V., Filippone, S., Nagle, D., & Rouson, D. (2014, October). OpenCoarrays: open-source transport layers supporting coarray Fortran compilers. In *Proceedings of the 8th International Conference on Partitioned Global Address Space Programming Models* (p. 4). ACM.