Writing by Regularly Space Data in PHDF5

In this case, each process writes data from a contiguous buffer into disconnected locations in the file, using a regular pattern.

In C it is done by selecting a hyperslab in a file that consists of regularly spaced columns. In F90, it is done by selecting a hyperslab in a file that consists of regularly spaced rows.

Figure a *C Example*	**Figure b** *FORTRAN 90 Example*

Writing Regularly Spaced Columns in C

In this example, you have two processes that write to the same dataset, each writing to every other column in the dataset. For each process the hyperslab in the file is set up as follows:

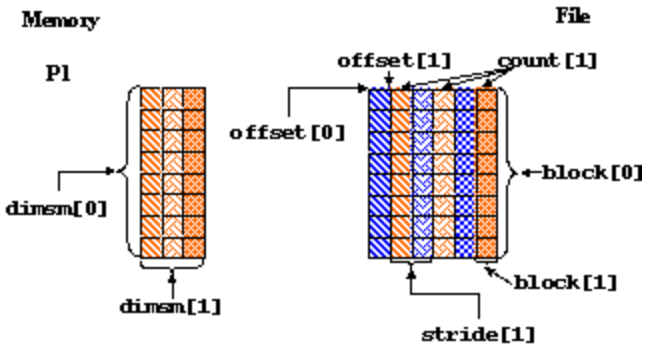
```
89      count[0] = 1;
    90      count[1] = dimsm[1];
    91      offset[0] = 0;
    92      offset[1] = mpi_rank;
    93      stride[0] = 1;
    94      stride[1] = 2;
    95      block[0] = dimsf[0];
    96      block[1] = 1;
```

The *stride* is 2 for dimension 1 to indicate that every other position along this dimension will be written to. A *stride* of 1 indicates that every position along a dimension will be written to.

For two processes, the *mpi_rank* will be either 0 or 1. Therefore:

- Process 0 writes to even columns (0, 2, 4...)
- Process 1 writes to odd columns (1, 3, 5...)

The *block* size allows each process to write a column of data to every other position in the dataset.



Below is an example program for writing hyperslabs by column in Parallel HDF5:

C Example

The following is the output from *h5dump* for the HDF5 file created by this example:

```
HDF5 "SDS_col.h5" {
GROUP "/" {
   DATASET "IntArray" {
      DATATYPE  H5T_STD_I32BE
      DATASPACE  SIMPLE { ( 8, 6 ) / ( 8, 6 ) }
      DATA {
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200,
         1, 2, 10, 20, 100, 200
      }
   }
}
}
```

Writing Regularly Spaced Rows in FORTRAN 90

In this example, you have two processes that write to the same dataset, each writing to every other row in the dataset. For each process the hyperslab in the file is set up as follows:

```
83       ! Each process defines dataset in memory and writes it to
    84       ! the hyperslab in the file.
    85       !
    86       count(1) = dimsm(1)
    87       count(2) = 1
    88       offset(1) = mpi_rank
    89       offset(2) = 0
    90       stride(1) = 2
    91       stride(2) = 1
    92       block(1) = 1
    93       block(2) = dimsf(2)
```

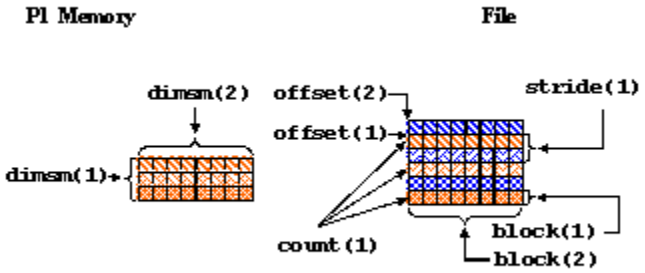
The *stride* is 2 for dimension 1 to indicate that every other position along this dimension will be written to. A *stride* of 1 indicates that every position along a dimension will be written to.

For two process, the *mpi_rank* will be either 0 or 1. Therefore:

- Process 0 writes to even rows (0, 2, 4 ...)
- Process 1 writes to odd rows (1, 3, 5 ...)

The *block* size allows each process to write a row of data to every other position in the dataset, rather than just a point of data.

The following shows the data written by Process 1 to the file:



Below is the example program for writing hyperslabs by column in Parallel HDF5:

F90 Example

The output for *h5dump* on the file created by this program will look like the output as shown above for the C example. This is because *h5dump* is written in C. The data would be displayed in rows if it were printed using Fortran 90 code.