

IOR: I/O Performance Benchmark

Summary Version

1.0

Purpose of Benchmark

IOR is used for testing performance of parallel file systems using various interfaces and access patterns.

Characteristics of Benchmark

IOR uses MPI for process synchronization.

Mechanics of Building Benchmark

Type `gmake [posix|mpio|hdf5|ncmpi|all]` from the IOR/ directory. In IOR/src/C, the file `Makefile.config` currently has settings for AIX, Linux, OSF1 (TRU64), and IRIX64 to model on. Note that MPI must be present for building/running IOR, and that MPI I/O must be available for MPI I/O, HDF5, and Parallel netCDF builds. As well, HDF5 and Parallel netCDF libraries are necessary for those builds. All IOR builds include the POSIX interface.

Mechanics of Running Benchmark

General instructions for running IOR are given in the `USER_GUIDE`. More specific examples of how one might run the specified tests follow:

1) File IO Subsystem Performance Example

```
srunk -N3 -n3 -ppdebug ./IOR.exe -vv -k -wWr -C -F -i4 -t 256k -b 10m
-s574 -o /p/lscratcha/rhedges/testFile
```

This example runs one process per node on three nodes. The transfer size, block size, and segment count can be adjusted for optimal performance, and the segment count times the block size is the amount of data written by each process.

2) IOR Instructions and Input File for File IO Function Ship Test

a) There will need to be a small patch to IOR so that test files are overwritten in the stonewalling mode:

In the 2.10.1 version of IOR, the file `IOR.c` is modified:

```
zeus286{rhedges}141: diff IOR.c IOR.c.orig
2412,2415d2411
< /*rmh*/
<   if((offsetArray[pairCnt] == -1) &&(test->deadlineForStonewalling != 0)) {
<       pairCnt = 0;
<   }
```

b) Launch as: `srunk -N2 -n16 -ppdebug ./IOR -f IOR.input`

c) IOR.input

```
===== > start script <=====
IOR START
  api=POSIX
  testFile=/p/lscratcha/rhedges/testFile
  repetitions=4
  readFile=1
  writeFile=1
  filePerProc=1
  checkWrite=0
  checkRead=0
  keepFile=0
  segmentCount=1
  blockSize=1g
  transferSize=1m
  reorderTasks=0
  deadlineForStonewalling=100
  useExistingTestFile=0
RUN
```

Verification of Results

Correctness of the data is verified in example 1) above.