DelayedArray / HDF5Array update

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April 2021
1. Recent additions to package DelayedArray

2. Recent additions to package HDF5Array

3. Work in progress and future work
1 Recent additions to package DelayedArray

Recent additions to package HDF5Array

3 Work in progress and future work
This would ordinarily take up 8 TB of memory:

```r
library(DelayedArray)
CM <- ConstantArray(c(1e6, 1e6), value=NA_real_)
CM

## <1000000 x 1000000> ConstantMatrix object of type "double":
## [,1] [,2] [,3] ... [,999999] [,1000000]
## [1,] NA NA NA . NA NA
## [2,] NA NA NA . NA NA
## [3,] NA NA NA . NA NA
## [4,] NA NA NA . NA NA
## [5,] NA NA NA . NA NA
## ... . . . . .
## [999996,] NA NA NA . NA NA
## [999997,] NA NA NA . NA NA
## [999998,] NA NA NA . NA NA
## [999999,] NA NA NA . NA NA
## [1000000,] NA NA NA . NA NA

lobstr::obj_size(CM)

## 1.33 kB
```
sinkApply(): a convenience function for walking on a RealizationSink derivative for the purpose of filling it with blocks of data

Example: Fill a \(1e6 \times 1e6\) on-disk matrix with random data

```r
sink <- HDF5RealizationSink(c(1e6L, 1e6L))  # or TileDBRealizationSink

sink_grid <- defaultSinkAutoGrid(sink)

FUN <- function(sink, viewport) {
  block <- array(runif(length(viewport)), dim=dim(viewport))
  write_block(sink, viewport, block)
}

sink <- sinkApply(sink, FUN, grid=sink_grid)

close(sink)

M <- as(sink, "DelayedArray")
```
rbind(), cbind(), and sparsity

rbind() and cbind() of DelayedArray objects now propagate sparsity

```
tenx1 <- HDF5Array::TENxMatrix("tenx1.h5") # is_sparse(tenx1) is TRUE
tenx2 <- HDF5Array::TENxMatrix("tenx2.h5") # is_sparse(tenx2) is TRUE

bigtenx <- cbind(tenx1, tenx2) # is_sparse(bigtenx) # TRUE
blockApply(bigtenx, FUN, ...) # will take advantage of sparsity
```
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HDF5Array(): can now take an URL to a file on Amazon S3 (kind of slow!)

H5SparseMatrix: a DelayedMatrix subclass for representing and operating on an HDF5 sparse matrix stored in CSR/CSC/Yale format (e.g. 10x Genomics and h5ad formats)
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Work in progress:

h5summarize(..., op="sum"): Optimized summarization of an HDF5 dataset or subset:
- Implemented in C (direct calls to HDF5 C lib in Rhdf5lib)
- Operates at the level of the physical chunks
- More efficient than blockApply()
- Integration to DelayedArray/DelayedMatrixStats: h5summarize() will be used behind the scene by things like rowVars()

Future work:

SparseArray objects: In-memory sparse representation of arrays of arbitrary dimensions
- Already used internally by block processing of sparse DelayedArray objects (current name is SparseArraySeed)
- Will go to their own package (currently in DelayedArray)
- Implement fast native operations: arithmetic, Math group (e.g. log), summarization, etc..
  This will benefit block processing of sparse DelayedArray objects