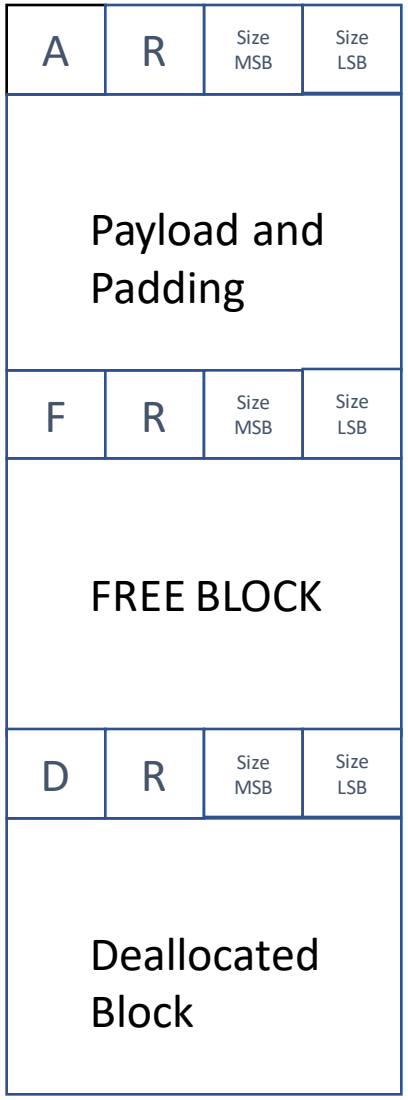
Akshay Murgod

Memalloc Restful Service

KEY DESIGN CONSIDERATIONS

- Keep the length of the block in the header preceding the block
- Requires an extra 4 bytes for every allocated block
- Keeping track of Allocated Blocks through Implicite Alloc List (Tags)
- NEW operation to allocate byte buffer of Length P * N. P- page size and N – No of pages.
- ALLOC operation to allocate Memory block and update the free memory space.
- DEALLOC operation should ***Coalesce*** the blocks in ***both direction*** (DE-FRAGMENTATION)
- DEFRAG is performed along with DEALLOC operation.

BUFFER STRUCTURE (HEADER + PAYLOAD)



Header:

Byte1: A – Allocated, D – Deallocated, F – Free
Byte2: R- Reserved for future use
Byte3: MSB bits of Size.
Byte4: LSB bits of Size.

Note: Size is represented in blocks not in bytes. Ex : 20 Bytes is represented as Size = 5.

DIFFERENT OPERATIONS AND BUFFER STATUS

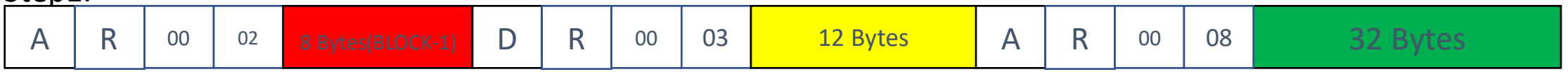
NEW (P = 64 N = 1)

ALLOC (M = 5)

ALLOC (M = 10)

DEALLOC (Tag = BLOCK-2)

Step1:



Step2: De-fragmention is performed along with Deallocation.

DFRAG

SHOW

{
"totalMemory":64,
"availableMemory":44,
"freeMemory":44,
"defaultHdrBlock":4,
"allocatedMemory":12,
"allocateHdrBlocks":4,
"deallocatedMemory":0,
"deallocatedHdrBlocks":0,

"buffer":"AR\u0000\u0003xxxxxxxxxxxxFR\u0000\u000Bffffffffffffffffffffffffffffffffffffffffffff“
}

Framework and Technologies used

- RESTful services are developed in Spring a Java based web framework.
- Maven package manager is used to build jar file and manage dependency.
- For packaging JAR is chosen over to WAR to avoid dependency on web server. WAR is industry standard to deploy web applications.
- POSTMAN or Curl can be used to test the REST endpoints. The endpoint details are given in following sections.

HOW TO RUN:

To build:
mvn clean;mavn install
To run
java -jar target/Memallocator-0.0.1-SNAPSHOT.jar