











Consider 30-byte heap

Free() frees all 10 bytes segments

No contiguous 30-byte chunk exists

head \longrightarrow addir:10 len:10

Request arrives: malloc(30)

Allocation can now proceed

| | MEMORY HEADERS |
|--|---|
| | free(void *ptr): Does not require a size parameter How does the OS know how much memory to free? |
| | Header block Small descriptive block of memory at start of chunk |
| | ptr |

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An Allocated Region Plus Heade

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L15.8



COALESCING

→ addr:0 Len:10

Coalescing regroups chunks into contiguous chunk

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→ addr:20 len:10

-> NULL

L15.7







| | | | | | - | | |
|---|---|--|----------------------------------|--------|---|------------|--|
| FR | EE LIST: | MALLOC() | CALL | | | | FREE LIST |
| Consider a re Header block 4 bytes for si Split the heat | quest for a 10 requires 8 by ize, 4 bytes for r | 0 bytes: mallo es nagic number | c(100) | | | | 8 bytes header magic: size: size: |
| A 4KB Heap head \longrightarrow size the rest of the 4KB chunk | With One Free Chunk e: 4088 t: 0 | A Heap : After One Alloca size: 100 magic: 1234567 | tion the 100 bytes now alloc: | ated | | | sptr -> Inagics |
| | hi | aad → size: 3980 next: 0 | the free 3980 byte chunk | | | | head → size next: Free Space With Th |
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