WHAT IS CLAIMED IS:

1. A storage device comprising:

a nonvolatile memory device;

a random access memory including a first region and a second region; and

a controller configured to,

use the first region of the random access memory as a journal memory for a journal indicating modification of data of the second region,

expose a user region of the nonvolatile memory device to an external host device as a first access region of a block unit, and

expose the second region of the random access memory to the external host device as both a second access region of the block unit and a third access region of a byte unit.

2. The storage device of claim 1, wherein the controller is configured to support a write operation of the byte unit and a read operation of the block unit with regard to the second region.

3. The storage device of claim 2, wherein the controller is configured to,

perform the read operation of the block unit with regard to the second region based on a recovery mode of the storage device, and

perform the write operation of the byte unit with regard to the second region based on a normal mode of the storage device.

4. The storage device of any one of claims 1 to 3, wherein the controller is configured to, based on a request received from the external host device,

provide the request to the nonvolatile memory device based on the request including a logical block address that is within the user region, and

provide the request to the second region based on the request including a logical block address that is within the second region.

5. The storage device of claim 1, wherein the controller is configured to, based on a request received from the external host device,

translate a logical block address into a first physical address corresponding to the logical block address from among physical addresses of the second region based on the request including the logical block address that is within the second region, and

translate a virtual address into a second physical address corresponding to the virtual address from among the physical addresses of the second region based on the request including the virtual address that is within the second region.

6. The storage device of any one of claims 1 to 5, wherein the controller is further configured to,

back up data stored in the second region to the nonvolatile memory device based on an interruption of power from the external host device, and

load the data onto the second region based on a restoration of power from the external host device.

7. The storage device of claim 6, further comprising an auxiliary power source includes a tantalum capacitor or a super capacitor, wherein the auxiliary power source is configured to,

charge when the power is supplied by the external host device, and

supply power to the storage device during the interruption of power from the external host device.

8. The storage device of claim 6 or claim 7,

wherein the nonvolatile memory device further includes an over-provision region not exposed to the external host device,

wherein the controller is further configured to back up the data stored in the second region to a free storage space of the user region or the over-provision region of the nonvolatile memory device.

9. The storage device of any one of claims 6 to 8,

wherein the second region includes segments, and

wherein the controller is configured to back up the data stored in the second region by storing the data that are selected from the segments of the second region, in segments of the nonvolatile memory device.

10. The storage device of claim 9,

wherein the controller is configured to,

fixedly select a first segment having a lowest address or a highest address from among the segments, and

select at least two second segments having continuous addresses from among the remaining segments of the segments other than the first segment,

wherein addresses of the at least two second segments are variable.

11. The storage device of claim 10, wherein the controller is configured to select the addresses of the at least two second segments based on a request of the external host device.

12. The storage device of claim 11, wherein the controller is configured to,

write the data stored in a segment having a lowest address from among the at least two second segments in the nonvolatile memory device,

deselect the segment having the lowest address from among the at least two second segments, and

select a segment corresponding to an address that is continuous to a highest address of the addresses of the at least two second segments and that is higher than the highest address of the at least two second segments.

13. The storage device of claim 12,

wherein the data include a logical block address, and

wherein the controller is further configured to,

translate the logical block address of the data into a physical block address of the nonvolatile memory device, and

write the data in the nonvolatile memory device based on the physical block address.

14. The storage device of any one of claims 10 to 13, wherein the controller is further configured to select the at least two second segments of the remaining segments in a ring buffer manner.

15. The storage device of any one of claims 1 to 14, wherein the controller is further configured to provide the second region to the external host device as a journal region.

16. A storage device comprising:

a nonvolatile memory device;

a dynamic random access memory including a first region and a second region including a set of segments; and

a controller configured to,

use the first region as a journal memory for a journal indicating modification of data of the second region,

expose a user region of the nonvolatile memory device to an external host device as a first access region of a block unit,

select a first segment of the segments, to select at least two second segments from the remaining segments of the segments other than the first segment, and

provide nonvolatility to the selected segments,

wherein the at least two second segments are dynamically changed in a ring buffer manner within the remaining segments, and

wherein the controller is further configured to expose the second region to the external host device as both a second access region of the block unit and a third access region of a byte unit.

17. The storage device of claim 16, wherein the controller is further configured to,

back up data stored in the selected segments to the nonvolatile memory device based on an interruption of power from an external host device, and

load the data onto the selected segments based on a restoration of power from the external host device.

18. The storage device of claim 16 or claim 17, wherein the controller is further configured to,

provide the first segment as a storage space of a superblock of a journal region of the external host device, and

provide the at least two second segments as a storage space of at least one transaction of the journal region of the external host device.

19. An operating method of a storage device including a controller, a nonvolatile memory device, and a dynamic random access memory, the method comprising:

providing, by the controller, a portion of a storage space of the nonvolatile memory device to an external host device as a user region; and

providing, by the controller, a portion of a storage space of the dynamic random access memory to the external host device as a journal region, a write operation of a byte unit and a read operation of a block unit being permitted, the journal region including segments,

exposing, by the controller, the user region of the nonvolatile memory device to the external host device as a first access region of the block unit,

exposing, by the controller, the journal region of the dynamic random access memory to the external host device as both a second access region of the block unit and a third access region of the byte unit, and

providing, by the controller, nonvolatility to a first segment and at least two second segments from among the segments, the first segment being fixed and the at least two second segments being dynamically changed.