CLAIMS

1. A storage system, comprising a first controller, a second controller, and a solid state disk, wherein the solid state disk is connected to the first controller, the solid state disk is connected to the second controller, wherein

the first controller is configured to:

allocate a first set of segments from multiple logical addresses provided by the solid state disk within a first time period, during the first time period the second controller allocating a second set of segments from the multiple logical addresses;

perform system garbage collection on the first set of segments; and

the second controller is configured to: perform system garbage collection on the second set of segments while the first controller is performing the system garbage collection on the first set of the segment.

2. The storage system according to claim 1, wherein the first set of the segments is all segments allocated by the first controller within the first period, and the second set of segments is all segments allocated by the second controller within the first time period.

3. The storage system according to claim 1 or 2, wherein the first period ends when a quantity of segments allocated by the first controller or the second controller within the first period reaches a first preset threshold.

4. The storage system according to any one of claims 1 to 3, wherein the first set of segments and the second set of segments belong to a same segment group, and a size of invalid data comprised in the segment group is larger than a size of invalid data comprised in any other segment group.

5. The storage system according to claim 4, wherein

the first controller is further configured to send a group identifier of the segment group to the second controller; and

the second controller is further configured to determine the second set of segments, according to a pre-stored correspondence between the group identifier and an identifier of the second set of segments.

6. The storage system according to any one of claims 1 to *5,* wherein

the first controller is configured to: send, to the solid state disk, a source logical address of valid data comprised in each of the first set of segments;

allocate a destination logical address to the valid data;

send the destination logical address to the solid state disk to instruct the solid state disk to copy

the valid data from the source logical address into the destination logical address; and

send an unmap command to the solid state disk to instruct the solid state disk to delete a correspondence between a logical address and an actual address of each segment, wherein the correspondence is stored by the solid state disk, and wherein the unmap command comprises a logical address range of each of the first set of segments.

7. A system garbage collection method, wherein the method is applied to a storage system, the storage system comprises a first controller, a second controller, and a solid state disk, the solid state disk is connected to the first controller, the solid state disk is connected to the second controller, and the method comprising:

allocating, by the first controller, a first set of segments from multiple logical addresses provided by the solid state disk coupled to the first controller within a first time period, during the first time period the second controller allocating a second set of segments from the multiple logical addresses;

performing, by the first controller, system garbage collection on the first set of segments; and

performing, by the second controller, system garbage collection on the second set of segments while the first controller is performing the system garbage collection on the first set of segments.

8. The method according to claim 7, wherein the first set of segments is all segments allocated by the first controller within the first period, and the second set of the segments is all segments allocated by the second controller within the first time period.

9. The method according to claim 7 or 8, wherein the first time period ends when a quantity of segments allocated by the first controller or the second controller within the first time period reaches a first preset threshold.

10. The method according to any one of claims 7 to 9, wherein the first set of segments and the second set of segments belong to a same segment group, and a size of invalid data comprised in the segment group is larger than a size of invalid data comprised in any other segment group.

11. The method according to claim 10, wherein the method further comprises:

sending, by the first controller, a group identifier of the segment group to the second controller; and

determining, by the second controller, the second set of segments according to a pre-stored correspondence between the group identifier and the second set of segments.

12. The method according to any one of claims 7 to 11, wherein

the performing, by the first controller, system garbage collection on multiple segments of segments managed by the first controller comprises:

sending, by the first controller to the solid state disk, a source logical address of valid data comprised in each of the first set of segments;

allocating, by the first controller, a destination logical address to the valid data;

sending, by the first controller, an unmap command to the solid state disk to instruct the solid state disk to delete a correspondence between a logical address and an actual address of each segment, wherein the correspondence is stored by the solid state disk, and wherein the unmap command comprises a logical address range of each of the first set of segments.