WHAT IS CLAIMED IS:

1. An image processing apparatus comprising:

an image processing section having a plurality of modules constituted by a plurality of image processing modules and a buffer module, the plurality of image processing modules acquiring image data from a preceding module thereof, applying a predetermined image processing to the acquired image data, and outputting processed image data or a result of the image processing to a following module thereof, and the buffer module being connected to at least one of a preceding stage or a following stage of the plurality of image processing modules, and being connected according to a pipe line aspect or a directed acyclic graph aspect so as to allow writing of the image data output from the preceding module in a buffer and reading of the image data stored in the buffer by the following module; and

a storage resource management unit that determines whether or not a capacity of a storage resource necessary for allocation is equal to or less than a remaining amount of a securable memory when a module needs to be allocated with the storage resource, or secures the memory and allocates the secured memory as the storage resource to the module that needs to be allocated with the storage resource when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, or secures a storage region of an external storage apparatus so as to allocate the secured storage region of the external storage apparatus as the storage resource to the module that needs to be allocated with the storage resource, or secures the storage region of the external storage apparatus so as to write data written in a memory which has already been allocated to another module as the storage resource in the secured storage region of the external storage apparatus and allocate the storage region of the external storage apparatus in which the data is written to the other module in place of the memory in which the data had been written and allocates the memory which had been allocated to the other module as the storage resource to the module that needs to be allocated with the storage resource, when the capacity of the storage resource necessary for allocation is larger than the remaining amount.

2. An image processing apparatus of claim 1, wherein the storage resource management

unit allocates a fixed allocation of the memory in advance as the storage resource necessary for each of the image processing modules, or secures the memory in advance for each of the image processing modules and allocates the memory as the storage resource when the image processing module requires the storage resource.

3. An image processing apparatus of claim 1, wherein the storage resource management unit is provided in respective buffer modules, determines whether or not the capacity of the storage resource necessary for allocation is equal to or less than a remaining amount of the securable memory when the buffer module requires allocation of the storage resource, secures the memory and allocates the secured memory as the storage resource to the buffer module when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, or secures the storage region of the external storage apparatus and allocates the secured storage region of the external storage apparatus as the storage resource to the buffer module when the capacity of the storage resource necessary for allocation is larger than the remaining amount.

4. An image processing apparatus of claim 1, wherein the modules are activated in parallel to each other.

5. An image processing apparatus of claim 2, wherein the memory has a fixed amount and is allocated in advance to respective buffer modules, the storage resource management unit determines whether or not the capacity of the storage resource necessary for allocation is equal to or less than a remaining amount of the memory allocated in advance to the buffer module when the buffer module needs to be allocated with the storage resource, allocates the memory allocated in advance as the storage resource to the buffer module when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, or secures the storage region of the external storage apparatus and allocates the secured storage region of the external storage apparatus as the storage resource to the buffer module when the capacity of the storage resource necessary for allocation is larger than the remaining amount.

6. An image processing apparatus of claim 2, wherein the storage resource management

unit monitors release of the memory by a first buffer module which has been allocated with the memory as the storage resource and, when release of the memory is detected, writes data written in the storage region of the external storage apparatus which has already been allocated as the storage resource to a second buffer module in the released memory, and allocates the memory in which the data is written in place of the storage region of the external storage apparatus in which the data had been written, to the second buffer module that had been already allocated with the storage region of the external storage apparatus as the storage resource.

7. An image processing apparatus of claim 6, wherein when there are a plurality of second buffer modules to which the storage region of the external storage apparatus has been already allocated as the storage resource, the storage resource management unit selects a second buffer module to which the memory is allocated in place of the storage region of the external storage apparatus in earliest chronological order with respect to a time when the storage region of the external storage apparatus was allocated as the storage resource.

8. An image processing apparatus of claim 6, wherein a priority is set to each of the buffer modules, and when there are a plurality of second buffer modules to which the storage region of the external storage apparatus has been already allocated as the storage resource, the storage resource management unit selects a second buffer module to which the memory is allocated in place of the storage region of the external storage apparatus in a descending order of the priority.

9. An image processing apparatus of claim 8, wherein the image processing section is actuated by programs corresponding to the respective modules, the programs being executed in parallel to each other by a program execution resource, and further comprises an execution priority controller that executes an initial setting of an execution priority of each of the programs corresponding to the respective image processing modules in correspondence to a position in the connection aspect of the pipe line aspect or the directed acyclic graph aspect of the image processing module, changes the execution priority of each of the programs corresponding to the respective image

processing modules in correspondence to a progress degree of the image processing in the image processing section, and sets and changes the execution priority of each of the buffer modules in correspondence to the execution priority of the program corresponding to the image processing module directly connected to each of the buffer modules.

10. A computer readable medium storing a program for causing a computer with a memory and an external storage apparatus to execute an image processing, the processing comprising:

connecting modules constituted by a plurality of image processing modules and a buffer module according to a pipe line aspect or a directed acyclic graph aspect such that the plurality of image processing modules acquire image data from a preceding module thereof, apply a predetermined image processing to the acquired image data, and output the processed image data or a result of the image processing to a following module thereof, and the buffer module is connected to at least one of the preceding stage or the following stage of the plurality of image processing modules so as to allow writing of the image data output from the preceding module in a buffer and reading of the image data stored in the buffer by the following module;

determining whether or not a capacity of a storage resource necessary to be allocated is equal to or less than a remaining amount of a securable memory when a module needs to be allocated with the storage resource; and

when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, securing the memory and allocating the secured memory as the storage resource to the module that needs to be allocated with the storage resource, or, when the capacity of the storage resource necessary for allocation is larger than the remaining amount, securing a storage region of an external storage apparatus so as to allocate the secured storage region of the external storage apparatus as the storage resource to the module that needs to be allocated with the storage resource, or securing the storage region of the external storage apparatus so as to write data written in a memory which has been already allocated to another module as the storage resource in the secured storage region of the external storage apparatus and allocate the storage region of the external storage apparatus in which data is written to the other module in

place of the memory in which the data had been written and allocating the memory which had been allocated to the other module as the storage resource to the module that needs to be allocated with the storage resource.

11. A computer readable medium of claim 10, wherein the allocating further comprises allocating a fixed allocation of the memory in advance as the storage resource necessary for each of the image processing modules, or securing in advance the memory for each of the image processing modules and allocating the memory as the storage resource when the image processing module requires the storage resource.

12. A computer readable medium of claim 10, wherein the determining further comprises determining whether or not the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount of the securable memory when respective buffer modules require allocation of the storage resource, and the allocating further comprises securing the memory and allocating the secured memory as the storage resource to the buffer module when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, or securing the storage region of the external storage apparatus and allocating the storage region of the secured external storage apparatus as the storage resource to the buffer module when the capacity of the storage resource necessary to be allocated is larger than the remaining capacity.

13. A computer readable medium of claim 10, wherein the modules are activated in parallel to each other.

14. A computer readable medium of claim 11, wherein the memory has a fixed amount and is allocated in advance to respective buffer modules, the determining further comprises determining whether or not the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount of the memory allocated in advance to the buffer module that needs to be allocated with the storage resource when the buffer module needs to be allocated the storage resource, and the allocating further comprises allocating the memory allocated in advance as the storage resource to the

buffer module when the capacity of the storage resource necessary to be allocated is equal to or less than the remaining amount, or securing the storage region of the external storage apparatus and allocating the secured storage region of the external storage apparatus as the storage resource to the buffer module when the capacity of the storage resource necessary to be allocated is larger than the remaining amount.

15. A computer readable medium of claim 11, wherein the allocating further comprises monitoring release of the memory by a first buffer module which has been allocated with the memory as the storage resource and, when release of the memory is detected, writing the data written in the storage region of the external storage apparatus which has been already allocated to a second buffer module as the storage resource in the released memory, and allocating the memory in which the data is written in place of the storage region of the external storage apparatus in which the data had been written, to the second buffer module to which the storage region of the external storage apparatus had been already allocated as the storage resource.

16. A computer readable medium of claim 15, wherein when there are a plurality of second buffer modules to which the storage region of the external storage apparatus has been already allocated as the storage resource, the allocating further comprises selecting a second buffer module to which the memory is allocated in place of the storage region of the external storage apparatus, in earliest chronological order with respect a time when the second buffer modules are allocated with the storage region of the external storage apparatus as the storage resource.

17. A computer readable medium of claim 15, wherein when there are a plurality of second buffer modules to which the storage region of the external storage apparatus has been already allocated as the storage resource, a priority is set to each of the buffer modules, and the allocating further comprises selecting a second buffer module which is allocated with the memory in place of the storage region of the external storage apparatus in a descending order of the priority.

18. A computer readable medium of claim 17, wherein the image processing section is

actuated by programs corresponding to the respective modules, the programs being executed in parallel to each other by a program execution resource, and further comprising executing an initial setting of an execution priority of each of the programs corresponding to the respective image processing modules in correspondence to a position in the connection aspect of the pipe line aspect or the directed acyclic graph aspect of the image processing module, changing the execution priority of each of the programs corresponding to the respective image processing modules in correspondence to a progress degree of the image processing, and setting and changing the execution priority of each of the buffer modules in correspondence to the execution priority of the program corresponding to the image processing module directly coupled to each of the buffer modules.

19. A computer data signal embodied in a carrier wave for enabling a computer with a memory and an external storage apparatus to execute an image processing, the processing comprising:

connecting modules constituted by a plurality of image processing modules and a buffer module according to a pipe line aspect or a directed acyclic graph aspect such that the plurality of image processing modules acquire image data from a preceding module thereof, apply a predetermined image processing to the acquired image data, and output processed image data or a result of the image processing to a following module thereof, and a buffer module is coupled to at least one of a preceding stage or a following stage of the plurality of image processing modules so as to allow writing of the image data output from the preceding module in a buffer and reading of the image data stored in the buffer by the following module;

determining whether or not a capacity of a storage resource necessary for allocation is equal to or less than a remaining amount of a securable memory when a module needs to be allocated with the storage resource; and

when the capacity of the storage resource necessary for allocation is equal to or less than the remaining amount, securing the memory and allocating the secured memory as the storage resource to the module that needs to be allocated with the storage resource, or, when the capacity of the storage resource necessary for allocation is larger than the remaining amount, securing a storage region of an external storage apparatus so

as to allocate the secured storage region of the external storage apparatus as the storage resource to the module that needs to be allocated with the storage resource, or securing the storage region of the external storage apparatus so as to write data written in a memory which has been already allocated to another module as the storage resource in the secured storage region of the external storage apparatus and allocate the storage region of the external storage apparatus in which data is written to the other module in place of the memory in which the data had been written and allocating the memory which had been allocated to the other module as the storage resource to the module that needs to be allocated with the storage resource.