CLAIMS

1. A processor-based system for providing fine-grained Quality of Service (QoS) control of partitioned resources, comprising:

a partitioned resource subdivided into a plurality of partitions and configured to service a plurality of resource clients;

a plurality of allocation indicators, each corresponding to a partition of the plurality of partitions and a resource client of a plurality of resource clients, wherein each allocation indicator of the plurality of allocation indicators corresponds to a unique combination of a resource client and a partition; and

a resource allocation agent configured to allocate the partitioned resource among the plurality of resource clients based on an interpolation of the plurality of allocation indicators for each resource client of the plurality of resource clients, such that each resource client is allocated a percentage of the partitioned resource equal to an average of allocations of the plurality of partitions indicated by the plurality of allocation indicators for the resource client.

2. The processor-based system of claim 1, configured to allocate the partitioned resource among the plurality of resource clients based on the interpolation of the plurality of allocation indicators for each resource client of the plurality of resource clients by being configured to:

receive an access request for the partitioned resource from a resource client of the plurality of resource clients;

assign the access request to a partition of the partitioned resource; and

allocate a portion of the partition of the partitioned resource to the resource client based on an allocation indicator of the plurality of allocation indicators corresponding to the partition and the resource client.

3. The processor-based system of claim 2, wherein:

the partitioned resource comprises a system cache;

the resource allocation agent comprises a cache controller;

the plurality of partitions comprises a plurality of cache partitions of the system cache; and

the plurality of allocation indicators comprises a plurality of way masks each indicating one or more cache ways of a corresponding cache partition of the plurality of cache partitions that are allocated to a corresponding resource client of the plurality of resource clients.

4. The processor-based system of claim 3, wherein the resource allocation agent is configured to:

receive the access request for the partitioned resource from the resource client of the plurality of resource clients by being configured to receive a cache access request comprising a memory address; and

assign the access request to the partition of the partitioned resource by being configured to select a cache partition of the plurality of cache partitions of the system cache, based on a hash of the memory address.

5. The processor-based system of claim 2, wherein:

the partitioned resource comprises a plurality of memory access bandwidth providers to a shared system memory;

the resource allocation agent comprises a memory management unit (MMU);

the plurality of partitions comprises a plurality of memory controllers configured to access the shared system memory; and

the plurality of allocation indicators comprises a plurality of memory stride values each indicating a relative weight to be applied by a corresponding memory controller of the plurality of memory controllers for each memory access operation for a corresponding resource client of the plurality of resource clients.

6. The processor-based system of claim 5, wherein the resource allocation agent is configured to:

receive the access request for the partitioned resource from the resource client of the plurality of resource clients by being configured to receive a memory access request comprising a memory address; and

assign the access request to the partition of the partitioned resource by being configured to select a memory controller of the plurality of memory controllers to access the shared system memory, based on a hash of the memory address.

7. The processor-based system of claim 1 integrated into an integrated circuit (IC).

8. The processor-based system of claim 1 integrated into a device selected from the group consisting of: a set top box; an entertainment unit; a navigation device; a communications device; a fixed location data unit; a mobile location data unit; a global positioning system (GPS) device; a mobile phone; a cellular phone; a smart phone; a session initiation protocol (SIP) phone; a tablet; a phablet; a server; a computer; a portable computer; a mobile computing device; a wearable computing device; a desktop computer; a personal digital assistant (PDA); a monitor; a computer monitor; a television; a tuner; a radio; a satellite radio; a music player; a digital music player; a portable music player; a digital video player; a video player; a digital video disc (DVD) player; a portable digital video player; an automobile; a vehicle component; avionics systems; a drone; and a multicopter.

9. A processor-based system for providing fine-grained Quality of Service (QoS) control of partitioned resources, comprising a means for allocating a partitioned resource, subdivided into a plurality of partitions, among a plurality of resource clients based on an interpolation of a plurality of allocation indicators, each corresponding to a partition of the plurality of partitions and a resource client of the plurality of resource clients, wherein each allocation indicator of the plurality of allocation indicators corresponds to a unique combination of a resource client and a partition, such that each resource client is allocated a percentage of the partitioned resource equal to an average of allocations of the plurality of partitions indicated by the plurality of allocation indicators for the resource client.

10. A method for providing fine-grained Quality of Service (QoS) control of partitioned resources, comprising allocating, by a resource allocation agent of a processor-based system, a partitioned resource, subdivided into a plurality of partitions, among a plurality of resource clients based on an interpolation of a plurality of allocation indicators, each corresponding to a partition of the plurality of partitions and a resource client of the plurality of resource clients, wherein each allocation indicator of the plurality of allocation indicators corresponds to a unique combination of a resource client and a partition, such that each resource client is allocated a percentage of the partitioned resource equal to an average of allocations of the plurality of partitions indicated by the plurality of allocation indicators for the resource client.

11. The method of claim 10, wherein allocating the partitioned resource among the plurality of resource clients based on the interpolation of the plurality of allocation indicators comprises:

receiving an access request for the partitioned resource from a resource client of the plurality of resource clients;

assigning the access request to a partition of the partitioned resource; and

allocating a portion of the partition of the partitioned resource to the resource client based on an allocation indicator of the plurality of allocation indicators corresponding to the partition and the resource client.

12. The method of claim 11, wherein:

the partitioned resource comprises a system cache;

the resource allocation agent comprises a cache controller;

the plurality of partitions comprises a plurality of cache partitions of the system cache; and

the plurality of allocation indicators comprises a plurality of way masks each indicating one or more cache ways of a corresponding cache partition of the plurality of cache partitions that are allocated to a corresponding resource client of the plurality of resource clients.

13. The method of claim 12, wherein:

receiving the access request for the partitioned resource from the resource client of the plurality of resource clients comprises receiving a cache access request comprising a memory address; and

assigning the access request to the partition of the partitioned resource comprises selecting a cache partition of the plurality of cache partitions of the system cache based on a hash of the memory address.

14. The method of claim 11, wherein:

the partitioned resource comprises a plurality of memory access bandwidth providers to a shared system memory;

the resource allocation agent comprises a memory management unit (MMU);

the plurality of partitions comprises a plurality of memory controllers configured to access the shared system memory; and

the plurality of allocation indicators comprises a plurality of memory stride values each indicating a relative weight to be applied by a corresponding memory controller of the plurality of memory controllers for each memory access operation for a corresponding resource client of the plurality of resource clients.

15. The method of claim 14, wherein:

receiving the access request for the partitioned resource from the resource client of the plurality of resource clients comprises receiving a memory access request comprising a memory address; and

assigning the access request to the partition of the partitioned resource comprises selecting a memory controller of the plurality of memory controllers based on a hash of the memory address.

16. A non-transitory computer-readable medium having stored thereon computer-executable instructions which, when executed by a processor, cause the processor to allocate a partitioned resource, subdivided into a plurality of partitions, among a plurality of resource clients based on an interpolation of a plurality of allocation indicators, each corresponding to a partition of the plurality of partitions and a resource client of the plurality of resource clients, wherein each

allocation indicator of the plurality of allocation indicators corresponds to a unique combination of a resource client and a partition, such that each resource client is allocated a percentage of the partitioned resource equal to an average of allocations of the plurality of partitions indicated by the plurality of allocation indicators for the resource client.

17. The non-transitory computer-readable medium of claim 16 having stored thereon computer-executable instructions which, when executed by a processor, further cause the processor to allocate the partitioned resource among the plurality of resource clients based on the interpolation of the plurality of allocation indicators by causing the processor to:

receive an access request for the partitioned resource from a resource client of the plurality of resource clients;

assign the access request to a partition of the partitioned resource; and

allocate a portion of the partition of the partitioned resource to the resource client based on an allocation indicator of the plurality of allocation indicators corresponding to the partition and the resource client.

18. The non-transitory computer-readable medium of claim 17, wherein:

the partitioned resource comprises a system cache;

the resource allocation agent comprises a cache controller;

the plurality of partitions comprises a plurality of cache partitions of the system cache; and

the plurality of allocation indicators comprises a plurality of way masks each indicating one or more cache ways of a corresponding cache partition of the plurality of cache partitions that are allocated to a corresponding resource client of the plurality of resource clients.

19. The non-transitory computer-readable medium of claim 18 having stored thereon computer-executable instructions which, when executed by a processor, further cause the processor to:

receive the access request for the partitioned resource from the resource client of the plurality of resource clients by causing the processor to receive a cache access request comprising a memory address; and

assign the access request to the partition of the partitioned resource by causing the processor to select a cache partition of the plurality of cache partitions of the system cache based on a hash of the memory address.

20. The non-transitory computer-readable medium of claim 17, wherein:

the partitioned resource comprises a plurality of memory access bandwidth providers to a shared system memory;

the resource allocation agent comprises a memory management unit (MMU);

the plurality of partitions comprises a plurality of memory controllers configured to access the shared system memory; and

the plurality of allocation indicators comprises a plurality of memory stride values each indicating a relative weight to be applied by a corresponding memory controller of the plurality of memory controllers for each memory access operation for a corresponding resource client of the plurality of resource clients.

21. The non-transitory computer-readable medium of claim 20 having stored thereon computer-executable instructions which, when executed by a processor, further cause the processor to:

receive the access request for the partitioned resource from the resource client of the plurality of resource clients by causing the processor to receive a memory access request comprising a memory address; and

assign the access request to the partition of the partitioned resource by causing the processor to select a memory controller of the plurality of memory controllers based on a hash of the memory address.