

CLAIMS

1. A computer program product for managing data in a plurality of memory devices in a computing system, the computer program product comprising a computer readable storage medium having computer readable program code embodied therein that when executed performs operations, the operations comprising:
 - indicating data structures to demote after initialization from a first level memory device to a second level memory device, wherein the first level memory device has lower latency than the second level memory device; and
 - in response to completing initialization of the data structures in the first level memory device, copying the data structures indicated to demote after initialization from the first level memory device to the second level memory device and removing the data structures indicate to move after initialization from the first level memory device.
2. The computer program product of claim 1, wherein the operations further comprise:
 - receiving a read request to a data structure stored in the second level memory device; and
 - returning data to the read request from the data structure stored in the second level memory device.
3. The computer program product of claim 1, wherein the operations further comprise:
 - maintaining access counts for the data structures stored in the first level memory device that are not indicated to demote after initialization, wherein access counts are not maintained for data structures indicated to demote after initialization.
4. The computer program product of claim 3, wherein the operations further comprise:
 - using the access counts to select data structures to remove from the first level memory device and retain in the second level memory device to free space in the first level memory device; and
 - using the access counts to determine whether to remove accessed data structures from the second level memory device.
5. The computer program product of claim 1, wherein the operations further comprise:
 - receiving an update to a data structure indicated to demote after initialization;
 - copying the data structure to update from the second level memory device to the first level memory device to update; and
 - copying the updated data structure from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device.
6. A computer program product for managing data in a plurality of memory devices in a computing system, the computer program product comprising a computer readable storage medium having computer readable program code embodied therein that when executed performs operations, the operations comprising:

receiving an update to a data structure indicated to demote from a first level memory device;
copying the data structure to update from a second level memory device to the first level memory device to update, wherein the first level memory device has lower latency than the second level memory device; and
copying the updated data structure from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device in response to updating the data structure.

7. The computer program product of claim 6, wherein the update to the data structure is to at least one field in the data structure to update that is less than all the fields in the data structure, wherein the copying the data structure comprises copying only the at least one fields to update from the data structure to the first level memory device, wherein the copying the updated data structure comprises copying the updated at least one field from the first level memory device to the second level memory device and deleting the updated at least one field from the first level memory device.

8. The computer program product of claim 6, wherein the data structure to update is in the second level memory device, wherein the operations further comprise:
determining whether the update comprises an update event of a plurality of predefined update events;
copying the data structure to update to the first level memory device in response to determining the update comprises the update event;
performing a plurality of writes to the data structure as part of the update event;
and
copying the data structure updated as part of the update event from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device in response to completing the writes for the update event.

9. The computer program product of claim 8, wherein the predefined update events comprise a plurality of update events that are a member of a subset of update events comprising additional or removal of a logical device in the computing system; a volume in the computing system; path groups; physical paths; logical paths; and subsystem characteristics and other configuration changes.

10. The computer program product of claim 8, wherein the operations further comprise:
performing the update to the data structure to update in the second level memory device in response to determining that the update does not comprise one of the plurality of predefined update events.

11. A system, comprising:
a first level memory device;

a second level memory device;
a virtual memory manager to perform:
indicating data structures to demote after initialization from a first level memory device to a second level memory device, wherein the first level memory device has lower latency than the second level memory device; and
in response to completing initialization of the data structures in the first level memory device, copying the data structures indicated to demote after initialization from the first level memory device to the second level memory device and removing the data structures indicate to move after initialization from the first level memory device.

12. The system of claim 11, wherein the operations further comprise:
receiving a read request to a data structure stored in the second level memory device; and
returning data to the read request from the data structure stored in the second level memory device.
13. The system of claim 11, wherein the operations further comprise:
maintaining access counts for the data structures stored in the first level memory device that are not indicated to demote after initialization, wherein access counts are not maintained for data structures indicated to demote after initialization.
14. The system of claim 13, wherein the operations further comprise:
using the access counts to select data structures to remove from the first level memory device and retain in the second level memory device to free space in the first level memory device; and
using the access counts to determine whether to remove accessed data structures from the second level memory device.
15. The system of claim 11, wherein the operations further comprise:
receiving an update to a data structure indicated to demote after initialization;
copying the data structure to update from the second level memory device to the first level memory device to update; and
copying the updated data structure from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device.
16. A system, comprising:
a first level memory device;
a second level memory device;
a virtual memory manager to perform:
receiving an update to a data structure indicated to demote from a first level memory device;

copying the data structure to update from a second level memory device to the first level memory device to update, wherein the first level memory device has lower latency than the second level memory device; and

copying the updated data structure from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device in response to updating the data structure.

17. The system of claim 16, wherein the update to the data structure is to at least one field in the data structure to update that is less than all the fields in the data structure, wherein the copying the data structure comprises copying only the at least one fields to update from the data structure to the first level memory device, wherein the copying the updated data structure comprises copying the updated at least one field from the first level memory device to the second level memory device and deleting the updated at least one field from the first level memory device.

18. The system of claim 16, wherein the data structure to update is in the second level memory device, wherein the operations further comprise:

determining whether the update comprises an update event of a plurality of predefined update events;

copying the data structure to update to the first level memory device in response to determining the update comprises the update event;

performing a plurality of writes to the data structure as part of the update event;

and

copying the data structure updated as part of the update event from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device in response to completing the writes for the update event.

19. The system of claim 18, wherein the predefined update events comprise a plurality of update events that are a member of a subset of update events comprising additional or removal of a logical device in the computing system; a volume in the computing system; path groups; physical paths; logical paths; and subsystem characteristics and other configuration changes.

20. The system of claim 18,, wherein the operations further comprise:

performing the update to the data structure to update in the second level memory device in response to determining that the update does not comprise one of the plurality of predefined update events.

21. A method for managing data in a plurality of memory devices in a computing system, comprising:

indicating data structures to demote after initialization from a first level memory device to a second level memory device, wherein the first level memory device has lower latency than the second level memory device; and

in response to completing initialization of the data structures in the first level memory device, copying the data structures indicated to demote after initialization from the first level memory device to the second level memory device and removing the data structures indicate to move after initialization from the first level memory device.

22. The method of claim 21, further comprising:
receiving a read request to a data structure stored in the second level memory device; and
returning data to the read request from the data structure stored in the second level memory device.
23. The method of claim 21, further comprising:
maintaining access counts for the data structures stored in the first level memory device that are not indicated to demote after initialization, wherein access counts are not maintained for data structures indicated to demote after initialization.
24. The method of claim 23, further comprising:
using the access counts to select data structures to remove from the first level memory device and retain in the second level memory device to free space in the first level memory device; and
using the access counts to determine whether to remove accessed data structures from the second level memory device.
25. The method of claim 23, further comprising:
receiving an update to a data structure indicated to demote after initialization;
copying the data structure to update from the second level memory device to the first level memory device to update; and
copying the updated data structure from the first level memory device to the second level memory device and deleting the updated data structure from the first level memory device.