

CLAIMS:

1. A client apparatus of a memcached system, comprising:
memory;
one or more processors coupled with the memory; and
memcached logic stored in the memory, and operated by the one or more processors to:
maintain a local cache in the memory of the client apparatus of the
memcached system to store a subset of key-value pairs stored in one or more servers
of the memcached system,
receive a request to Update a value corresponding to a key in one of the key-value
pairs of the memcached system,
determine, in response to receipt of the request, whether the key results in a hit in
the local cache maintained in the memory of the client apparatus of the memcached
system, and
service the Update request based at least in part on whether a result of the
determine indicates the key results in a hit in the local cache of the client apparatus of
the memcached system.
2. The client apparatus of claim 1, wherein the memcached logic is to further
allocate or cause to be allocated storage spaces within the memory for the local cache.
3. A client apparatus of a memcached system, comprising:
memory;
one or more processors coupled with the memory; and
memcached logic operated by the one or more processors to:
receive a request to Get a value corresponding to a key in the memcached
system, determine, in response to receipt of the Get request, whether the key
results in a hit in a local cache maintained in memory by the memcached logic,
and
service the Get request based at least in part on whether a result of the
determine indicates the key results in a hit in the local cache;
wherein for a Get request with the key results in a hit, service comprises

access the local cache to retrieve one or more addresses of one or more locations of the memcached system where the value and an associated status flag of the value are stored;

perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the one or more addresses retrieved from the local cache; and

determine whether the value retrieved through the remote direct memory access operation is stale, based at least in part on the status flag retrieved through the remote direct memory access operation.

4. The client apparatus of claim 3, wherein for a Get request with the key results in a hit, service further comprises return the retrieved value, in response to a result of the stale determination indicating the value is not stale.

5. The client apparatus of claim 3, wherein for a Get request with the key results in a hit, service further comprises:

in response to a result of the stale determination indicating the value is stale,

transmit the Get request to a server of the memcached system to request the value;

receive second one or more addresses of second one or more locations of the memcached system where the value and an associated status flag of the value are stored;

perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the second one or more addresses received;

update the local cache to store the third and fourth addresses for the key; and
return the value received.

6. The client apparatus of claim 1, wherein for a Get request with the key not results in a hit, service comprises:

transmit the Get request to a server of the memcached system to request the value;

receive one or more addresses of one or more locations of the memcached system where the value, and an associated status flag of the value are stored;

perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the one or more addresses received; and

return the value received.

7. The client apparatus of claim 3, wherein perform a remote direct memory access comprises first determine a cache entry that yields the hit has not expired.

8. A server apparatus of a memcached system, comprising: memory; one or more processors coupled with the memory; network interface card equipped to support remote memory direct access; and

memcached logic stored in the memory and operated by the one or more processors to:

receive a request to Update a key from a client device of the memcached system in the memcached system with a corresponding value, wherein the client device maintains a local cache on the client device storing a subset of key-value pairs of stored the server apparatus and one or more other server apparatuses of the memcached system

determine whether the key results in a hit, and

in response to the key results in a hit, service the request to Update the key, by updating a status flag associated with a first item that yields the hit for the key with a stale status, adding the first item to a collect list, creating a second item for the key, and assigning the second item with the value.

9. The server of apparatus of claim 8, wherein the memcached logic to further periodically perform a maintenance operation to recover memory allocated to items having associated status flags with a stale status.

10. The server of apparatus of claim 8, wherein the memcached logic to further map physical addresses of the memory to an address space of the memcached system.

11. A method for memory caching data, comprising:

receiving from a client device of a memcached system, by a server of the memcached system, a request to Update a key in the memcached system with a

corresponding value, wherein the client device maintains a local cache on the client device storing a subset of key-value pairs of stored the server and one or more other servers of the memcached system

determining, by the server, whether the key results in a hit, and

in response to the key results in a hit, servicing, by the server, the request to Update the key, by updating a status flag associated with a first item that yields the hit for the key with a stale status, adding the first item to a collect list, creating an item for the key, and assigning the item with the value.

12. The method of claim 11, further comprising periodically performing, by the server, a maintenance operation to recover memory allocated to items having associated status flags with a stale status.

13. The method of claim 11, further comprising mapping, by the server, physical addresses of memory of the server to an address space of the memcached system.

14. At least one non-transitory computer-readable medium comprising a plurality of instructions, in response to execution of the instructions by a client apparatus of a memcached system, to cause the client apparatus to:

maintain a local cache in a memory of the client apparatus of the memcached system to store a subset of key-value pairs stored in one or more servers of the memcached system;

receive a request to Update a value corresponding to a key in one of the key-value pairs of the memcached system;

determine, in response to the receipt of the Update request, whether the key results in a hit in the local cache maintained in memory of the client apparatus of the memcached system; and

service, the Update request based at least in part on whether a result of the determine indicates the key results in a hit in the local cache of the client apparatus of the memcached system.

15. The non-transitory computer-readable medium of claim 14, wherein the client apparatus of a memcached system is further caused to allocate storage spaces within the memory for the local cache.

16. At least one non-transitory computer-readable medium comprising a plurality of instructions, in response to execution of the instructions by a client apparatus, to cause the client apparatus to:

- receive a request to Get a value corresponding to a key in the memcached system;
- determine, in response to the receipt of the Get request, whether the key results in a hit in a local cache maintained in memory of the client device; and
- service, the Get request based at least in part on whether a result of the determine indicates the key results in a hit in the local cache;

- wherein for a Get request with the key results in a hit, service comprises access the local cache to retrieve one or more addresses of one or more locations of the memcached system where the value and an associated status flag of the value are stored;

- perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the one or more addresses retrieved from the local cache; and

- determine whether the value retrieved through the remote direct memory access operation is stale, based at least in part on the status flag retrieved through the remote direct memory access operation.

17. The non-transitory computer-readable medium of claim 16, wherein for a Get request with the key results in a hit, service further comprises return the retrieved value, in response to a result of the stale determination indicating the value is not stale.

18. The non-transitory computer-readable medium of claim 16, wherein for a Get request with the key results in a hit, service further comprises:

- in response to a result of the stale determination indicating the value is stale, transmit the Get request to a server of the memcached system to request the value;

receive second one or more addresses of second one or more locations of the memcached system where the value and an associated status flag of the value are stored;

perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the second one or more addresses received;

update the local cache to store second or more addresses for the key; and
return the value received.

19. The non-transitory computer-readable medium of claim 16, wherein for a Get request with the key not results in a hit, service comprises:

transmit the Get request to a server of the memcached system to request the value;

receive one or more addresses of one or more locations of the memcached system where the value and an associated status flag of the value is stored;

perform a remote direct memory access operation on a server of the memcached system to retrieve the value and the associated status flag using the one or more addresses received; and

return the value received.

20. The non-transitory computer-readable medium of claim 16, wherein perform a remote direct memory access operation comprises first determine that a cache entry that yields the hit has not expired.