

Claims

1. A method comprising:

receiving, by a system comprising a processor, a client request for client-requested data;

accessing a cache set to attempt to locate the client-requested data;

if the data is in the cache set and is not expired data, returning, by the system, the data from the cache set in response to the client request; and

if the data is in the cache set and is expired data, maintaining, by the system, the expired data and requesting, by the system, the data from a data provider, and:

if the requested data is available from the data provider, receiving the data from the data provider in response to the request for the data from the data provider and returning, by the system, the data from the data provider in response to the client request, wherein the data provider includes a back-end cache set, and if the data provider is operating in an emergency mode, when the data is requested from the data provider, the data provider:

determines if the data exists as cached data in the back-end cache set, and

if the data exists as cached data in the back-end cache set, provides the data from the back-end cache set in a response to the system of whether the data in the back-end cache set is expired or not expired, and

if the data is not available from the data provider, returning, by the system, the expired data in response to the client request, with an indication that the expired data is currently expired at a time when the expired data is returned in the response to the client request.

2. The method of claim 1, wherein the data is not in the cache set, and further comprising requesting, by the system, the data from the data provider, determining, by the system, that the data is not available from the data provider and returning, by the system, an error response in response to the client request.

3. The method of claim 1, wherein the data is in the cache set and is expired, and further comprising determining, by the system, that the data is not available from the data provider, including receiving an error response from the data provider, or reaching a timeout expiration time without the requested data having been returned by the data provider.

4. The method of claim 1, wherein the data is in the cache set and is expired, and wherein the data corresponds to a plurality of data items, and further comprising determining, by the system, that the data is not available from the data provider, including reaching a timeout expiration time based upon not receiving each data item of the plurality of data items within the timeout expiration time.

5. The method of claim 1, wherein the data is in the cache set and is expired, and wherein the data corresponds to a plurality of data items, and further comprising determining, by the system, that the data is not available from the data provider, including receiving an error message in response to a request for any of the plurality of data items.

6. The method of claim 1, wherein requesting the data from the data provider comprises communicating, by the system, a request from a front-end service that includes the cache set to a back-end data service comprising the data provider.

7. The method of claim 6, further comprising receiving, by the system, expired

data from the back-end data service comprising the data provider in response to the request from the front-end data service to the back-end data service, and returning the expired data received at the front-end data service in response to the client request.

8. The method of claim 1, wherein the indication further comprises a description of a reason for the returning the expired data in response to the client request.

9. A system comprising:

a processor; and

a memory communicatively coupled to the processor, the memory having stored therein computer-executable instructions, comprising:

a front-end data service coupled to communicate with a back-end data service, and coupled to communicate with client requesters, the front-end data service:

receives a client request for data;

determine if the data exists in a front-end cache set to use in a response to the client request;

if the data exists as cached data in the front-end cache set and the cached data is not expired, provides the cached data from the front-end cache set in the response to the client request for data;

if the data does not exist as cached data in the front-end cache set, make a front-end service request for the data to the back-end data service, and if the data is returned from the back-end data service in a back-end response to the front-end service request, provides the data returned from the back-end data service in the response to the client request for data, wherein the back-end data service includes a back-

end cache set, and if the back-end data service is operating in an emergency mode, when the data is requested from the back-end data service by the front-end data service, the back-end data service:

determines if the data exists as cached data in the back-end cache set, and

if the data exists as cached data in the back-end cache set, provides the data from the back-end cache set in a response to the front-end service request independent of whether the data in the back-end cache set is expired or not expired; and

if the data exists as cached data in the front-end cache set, and the cached data is expired cached data, the front-end data service makes the front-end service request for the data to the back-end data service, and if the data is not available from the back-end data service, provides the expired cached data from the front-end cache set in response to the client request for data, with an indication that the expired cached data is currently expired at a time when the expired cache data is provided in the response to the client request, wherein the indication comprises a description of a reason for the providing the expired cached data in response to the client request in the indication.

10. The system of claim 9, wherein the front-end data service, if the data does not exist in the front-end cache set, and the data is not available from the back-end data service, returns an error in response to the client request.

11. The system of claim 9, wherein the front-end cache set comprises a single cache or at least two caches in a tiered cache configuration.

12. The system of claim 9, wherein the back-end data service includes the back-end cache set, and wherein when data is requested from the back-end data service by the front-end data service, the back-end data service:

determines if the data exists as cached data in the back-end cache set,
and

if the data exists as cached data in the back-end cache set, and the cached data is not expired, provides the data from the back-end cache set in a response to the front-end service request;

if the data does not exist as cached data in the back-end cache set, the back-end data service communicates with one or more backing data sources to make one or more back-end service requests for the data to the one or more backing data sources, and if the data is returned from the one or more backing data sources in one or more responses to the one or more back-end service requests, provides the data in a response to the front-end service request; or

if the data exists as cached data in the back-end cache set and is expired, the back-end data service communicates with one or more backing data sources to make one or back-end service requests for the data to the one or more backing data sources, and if the data is not available from the one or more backing data sources, provides the expired data in a response to the front-end service request, with an indication that the expired data is expired.

13. The system of claim 9, wherein the front-end data service includes a request multiplexer that multiplexes requests to the back-end data service and demultiplexes responses from the back-end data service.

14. A computer-readable storage medium having instructions stored thereon that, in response to execution, cause a system comprising a processor to perform

operations, comprising:

- receiving a client request for data at a front-end data service;

- accessing a front-end cache set to attempt to obtain the data;

- if the data exists as cached data in the front-end cache set

 - determining whether the cached data is expired cached data;

 - if the cached data is not expired cached data, providing the cached data in a response to the client; and

 - if the cached data is expired cached data, maintaining the expired cached data and communicating with a back-end data service to attempt to obtain the data, wherein the back-end data service includes a back-end cache set, and if the back-end data service is operating in an emergency mode, when the data is requested from the back-end data service by the front-end data service, the back-end data service:

 - determines if the data exists as cached data in the back-end cache set, and

 - if the data exists as cached data in the back-end cache set, provides the data from the back-end cache set in a response to the front-end service request independent of whether the data in the back-end cache set is expired or not expired, and:

 - if the data is available from the back-end data service, providing the data from the back-end data service in a response to the client, and if the data is not available from the back-end data service, providing the expired cached data in a response to the client, with an indication that the expired cached data is currently expired at a time when the expired cache data is provided in the response to the client.

15. The computer-readable storage medium of claim 14, the operations further comprising including a description of a reason for the returning the expired data in

response to the client request in the indication.

16. The computer-readable storage medium of claim 15, wherein the reason comprises reaching a timeout time before the back-end data service has returned the data.

17. The computer-readable storage medium of claim 15, wherein the reason comprises receiving an error message from the back-end data service.

18. The computer-readable storage medium of claim 15, wherein the reason comprises loss of communication with the back-end data service.

19. The method of claim 1, further comprising including a description of a reason for the returning the expired data in response to the client request in the indication.

20. The method of claim 1, wherein the reason comprises reaching a timeout time before the back-end data service has returned the data.