

WHAT IS CLAIMED IS:

1. A method comprising:
receiving a client request for client-requested data;
accessing a cache set to attempt to locate the client-requested data;
a) if the data is in the cache set and is not expired data, returning the data from the cache set in response to the client request; or
b) if the data is in the cache set and is expired data, maintaining the expired data and requesting the data from a data provider, and
 - i) 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 the data from the data provider in response to the client request; or
 - ii) if the data is not available from the data provider, returning the expired data in response to the client request.
2. The method of claim 1, wherein the data is not in the cache set, and further comprising, requesting the data from the data provider, determining that the data is not available from the data provider and returning 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 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 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 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 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 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 requesting the data from the data provider comprises communicating a request from a back-end service that includes the cache set to at least one backing data source comprising the data provider.

9. A system comprising, a front-end data service, the front-end data service coupled to communicate with a back-end data service, and the front-end data service coupled to communicate with client requesters, including to receive a client request for data, the front-end data service including a front-end cache set that is accessed for the request to determine if cached data exists in the front-end cache set to use in a response to the client request for data; and

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

if cached data does not exist in the front-end cache set, the front-end data makes a front-end service request for the data to the back-end data service, and if data is returned from the back-end data service in a back-end response to the front-end service request, the front-end data service uses the data returned from the back-end data service in the response to the client request for data; and

if cached data exists in the front-end cache set, and the cached data is expired cached data, the front-end data service makes a 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, the front-end data service uses the expired cached data from the front-end cache set in response to the client request for data.

10. The system of claim 9 wherein if cached data does not exist in the front-end cache set, and the data is not available from the back-end data service, the front-end 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 wherein the front-end cache set comprises at least two caches in a tiered cache configuration.

12. The system of claim 9 wherein the back-end data service includes a 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 cached data for the front-end service request exists in the back-end cache set, and

- if cached data exists in the back-end cache set, and the cached data is not expired, the back-end data service uses the data from the back-end cache set in a response to the front-end service request;
- if cached data does not exist in the back-end cache set, 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 returned from the one or more backing data sources in one or more responses to the one or more back-end service requests, the back-end data service uses the data in a response to the front-end service request; or
- if cached data exists 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, the back-end data service uses the expired data in a response to the front-end service request.

13. The system of claim 9 wherein the back-end data service includes a back-end cache set, wherein the back-end data service is operating in an emergency mode, 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 cached data for the front-end service request exists in the back-end cache set, and if cached data exists in the back-end cache set, the back-end data service uses 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.

14. The system of claim 9 wherein the front-end data service includes a batch manager that batches requests to the back-end data service.

15. 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.

16. One or more machine-readable storage media having machine-executable instructions, which when executed perform steps, comprising:
- (a) receiving a client request for data at a front-end data service;
 - (b) accessing a front-end cache set to attempt to obtain the data, and if obtained from the front-end cache set, determining whether the data is expired, and if not expired, using the data in a response to the client and advancing to step (d), and if expired, maintaining the expired data;
 - (c) communicating with a back-end data service to attempt to obtain the data, and if the data is available from the back-end data service, using the data in a response to the client and advancing to step (d), and
 - (i) if the data is not available from the back-end data service, and expired data is maintained via step (b), using the expired data in a response to the client and advancing to step (d); or
 - (ii) if the data is not available from the back-end data service and no expired data is maintained, providing an error message in a response to the client and advancing to step (d);
- and
- (d) communicating the response to the client.

17. The one or more machine-readable storage media of claim 16 having further machine-executable instructions comprising, determining that the data is not available from the back-end data service, including reaching a timeout time before the back-end data service has returned the data or receiving an error message from the back-end data service.

18. The one or more machine-readable storage media of claim 17 wherein the data requested from the back-end data service comprises a plurality of sub-requests, and wherein determining that the data is not available from the back-end data service comprises reaching a timeout time before the back-end data service has returned a data item response for each sub-request, or receiving an error message from the back-end data service for any sub-request.

19. The one or more machine-readable storage media of claim 16 wherein communicating with the back-end data service to attempt to obtain the data comprises sending a front-end data service request to the back-end data service, and having further machine-executable instructions comprising:

(I) receiving the front-end data service request for data at the back-end data service;

(II) accessing a back-end cache set to attempt to obtain the data, and if obtained from the back-end cache set, determining whether the data is expired, and if not expired, using the data in a back-end response to the front-end data service request and advancing to step (IV), and if expired, maintaining the expired data;

(III) communicating with one or more backing data sources to attempt to obtain the data, and if the data is available from the one or more backing data sources, using the data in a back-end response to the front-end data service request and advancing to step (IV), and

(i) if the data is not available from the front-end data service request and expired data is maintained via step (II), using the expired data in a back-end response to the front-end data service request and advancing to step (IV); or

(ii) if the data is not available from the one or more backing data sources and no expired data is maintained via step (II), providing an error message in a back-end response to the front-end data service request and advancing to step (IV);

and

(d) communicating the back-end response to the front-end data service.

20. The one or more machine-readable storage media of claim 16 wherein communicating with the back-end data service to attempt to obtain the data comprises sending a front-end data service request to the back-end data service, and having further machine-executable instructions comprising, operating the back-end data service is in an emergency mode, including receiving the front-end data service request for data at the back-end data service, accessing a back-end cache set to attempt to obtain the data, and if obtained from the back-end cache set, returning the data from the back-end cache set in response to the front-end data service request, and if not obtained from the back-end cache set, returning an error message in response to the front-end data service request.