Summarize the below image using your own words. Give examples of technologies that can perform parts of the workflow (e.g., Lucene and Solr for searching and full-text index).

A diagram of a data system

Description automatically generated

In the visual, there are several endpoints where the transaction between client request and data system is completed. However, the process can begin again if the client submits another request. One such endpoint occurs at the in-memory cache, and getting there could take one of two routes.

The first way to reach the in-memory cache is through checking if read requested data was previously cached for quick access. If not, or if a write request is submitted, the system will instead go through the primary database to process changes and update the cache or invalidate the request. The database changes can also lead to a second endpoint which is the full-text index.

A full-text index, such as Apache Lucene, can provide search results that include more depth and synonyms of the word in question. To reach the index, the application must process the changes to data in order to access and update it using the application as a medium. The other route includes querying a search request straight from the client.

Lastly, interacting with the outside world is the third endpoint. This is achieved by many separate tasks, and the order they are completed depends on the order they are requested. Client requests such as “refresh email inbox”, “get webpage”, or “send message” are all possible through these means.