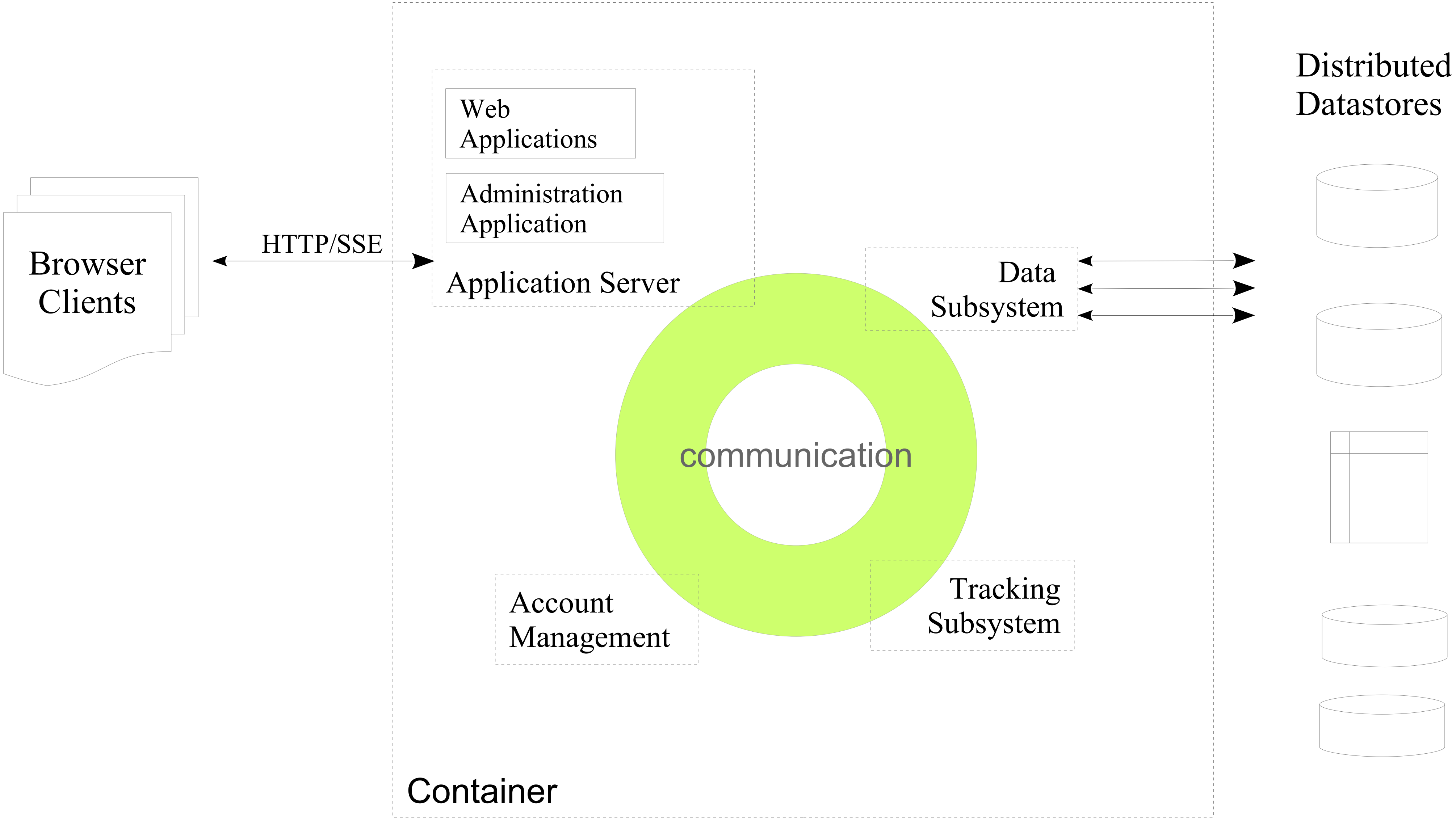
Music Catalog Web Application

Considerations for the backend system design

Real-time Data
CRUD
Data Views
CI/CD

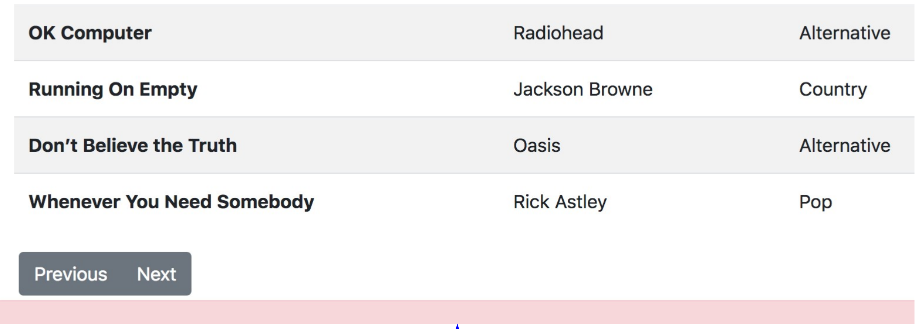
Coding test, Anne George

Real-time Data



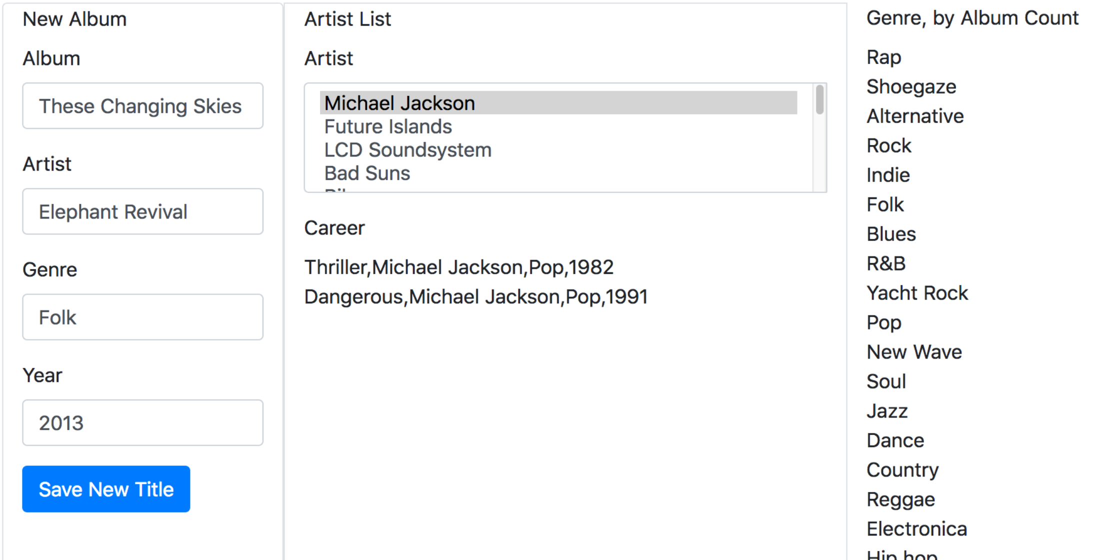
Anne George, Coding Test, March 2019

UI Support



OK Computer	Radiohead	Alternative
Running On Empty	Jackson Browne	Country
Don't Believe the Truth	Oasis	Alternative
Whenever You Need Somebody	Rick Astley	Pop

SSE - catalog sync
Range per User
CRUD
HTTP GET



New Album

Album: These Changing Skies

Artist: Elephant Revival

Genre: Folk

Year: 2013

Artist List

Artist

Michael Jackson
Future Islands
LCD Soundsystem
Bad Suns

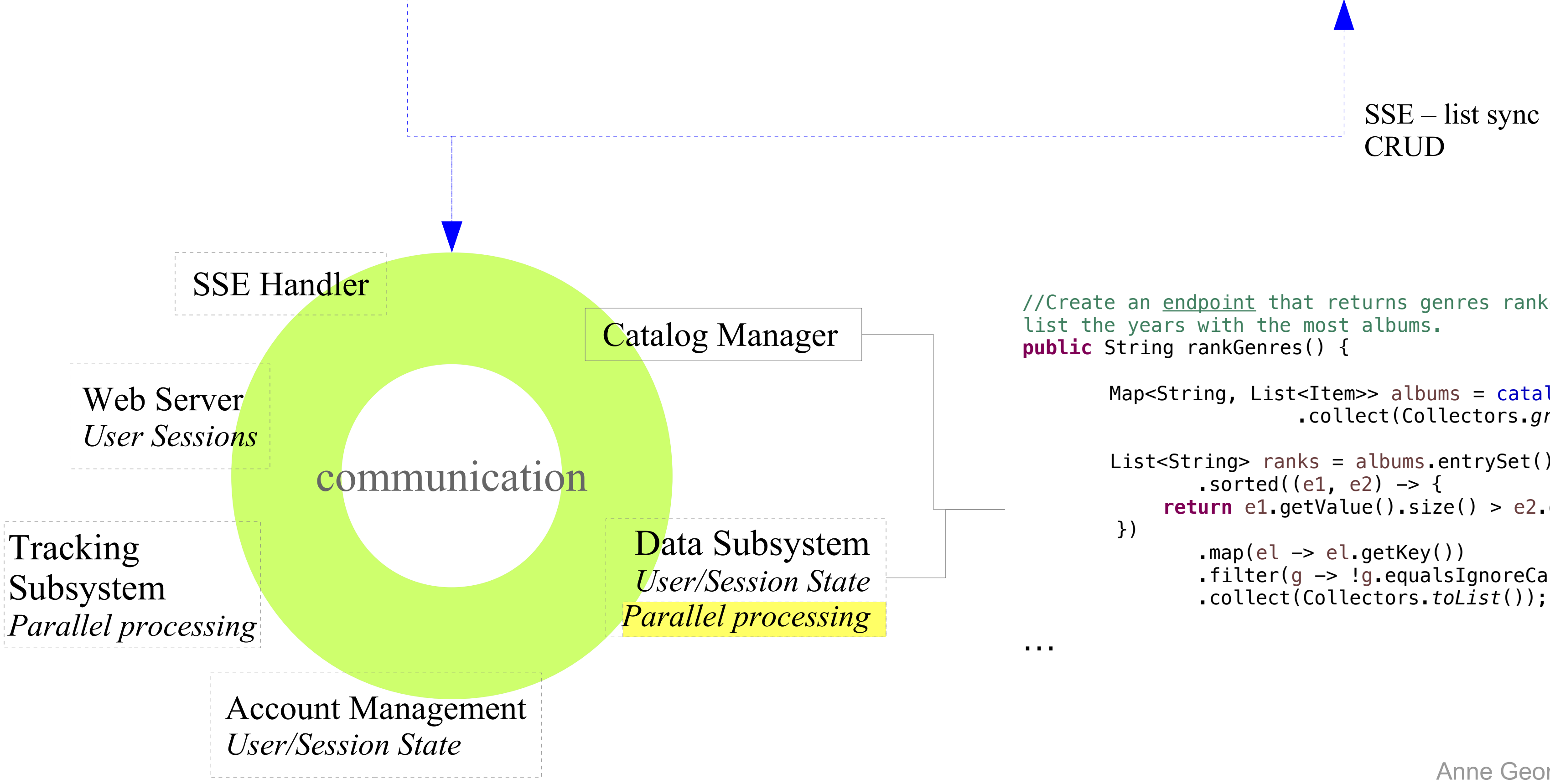
Career

Thriller,Michael Jackson,Pop,1982
Dangerous,Michael Jackson,Pop,1991

Genre, by Album Count

Rap
Shoegaze
Alternative
Rock
Indie
Folk
Blues
R&B
Yacht Rock
Pop
New Wave
Soul
Jazz
Dance
Country
Reggae
Electronica
Hip hop

SSE – list sync
CRUD



SSE Handler

Catalog Manager

Web Server
User Sessions

communication

Tracking
Subsystem
Parallel processing

Data Subsystem
User/Session State
Parallel processing

Account Management
User/Session State

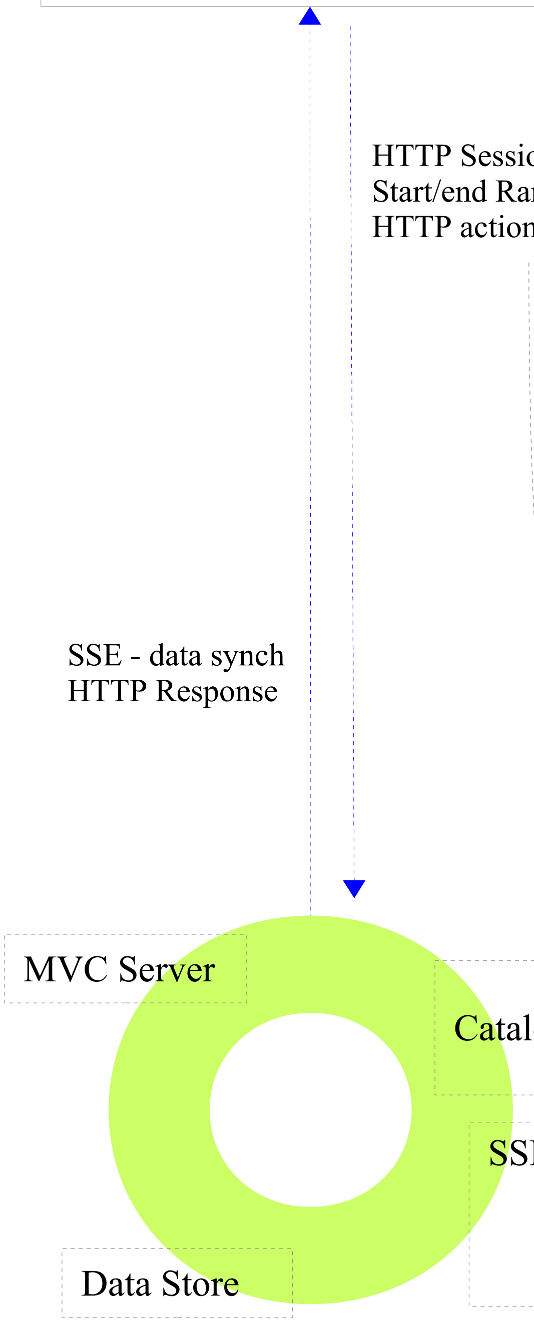
```
//Create an endpoint that returns genres ranked by number of albums or
list the years with the most albums.
public String rankGenres() {

        Map<String, List<Item>> albums = catalog.stream()
                         .collect(Collectors.groupingBy(Item::getGenre));

        List<String> ranks = albums.entrySet().stream()
                .sorted((e1, e2) -> {
            return e1.getValue().size() > e2.getValue().size() ? 1 : 0;
        })
                .map(el -> el.getKey())
                .filter(g -> !g.equalsIgnoreCase("genre"))
                .collect(Collectors.toList());

...
```

Web Application, *User Sessions*



HTTP Session:
Start/end Range Params
HTTP action

SSE - data synch
HTTP Response

```
/*
 * The responsibility of this class is to load the album catalog.
 *
 * This class can be re-factored to be it's own service.  The benefits of doing
that are the following:
 *   1. Real-time very large data set management
 *   2. Real-time CRUD across many users
 *   3. Real-time view management ; this means that when the user moves between
viewing one set of entries to the next, the available records may change.
 *   4. As it's own service, it can use threads to tally information about the
data in real-time (aka, statistics on use)(...or maybe analytics should it's
own service).
 *
 */
public class CatalogManager {

      /*
       * Using an ArrayList means the manager can maintain a sliding window
range into the catalog.
       * The view segment can be configurable based on tuning and analytics.
       * @TODO These settings can be configurable through properties.
       */
      public static final int PAGE = 10;

      private int start = 0;
      private int end = start + PAGE;

      private ArrayList<Item> catalog = new ArrayList<Item>(PAGE);

...
```

Start/end are not actually stored.

MVC Server

Catalog Service

Synchronize access to this data structure
- or -
Query data store, no data structure

SSE Handler

Server Side Events (SSE) prevent stale data in the client sessions, or the admin sessions.

Data Store