The ICD (International Classification of Diseases) code system search is implemented using the Hibernate Search library, which integrates Hibernate ORM with the Apache Lucene search engine. This allows for full-text search on entities using a familiar syntax.

**Controller:**

The Spring Boot REST controller provides three endpoints to interact with the ICD-10 code system:

1. /icd/search: This endpoint performs a full-text search on the ICD-10 code system using a search term. The search term is passed as a query parameter, and the search results are returned as a Page of IcdCode objects. The Pageable parameter allows clients to specify the page size and offset for the search results. The search is performed using the searchIcdCode() method of the IcdCodeSearchService class, which is autowired into the controller.

2. /icd/index: This endpoint creates an index for the ICD-10 code system. The index is created using the createIcdIndex() method of the IcdCodeSearchService class, which is autowired into the controller. The method returns a String message indicating whether the index creation was successful or not.

3. /icd/tree: This endpoint retrieves a hierarchical tree of ICD-10 codes, given a parent code. The parent code is passed as a query parameter, and the tree is returned as a list of IcdCodeTree objects. The tree is generated using the getICDParentAndSiblings() method of the IcdCodeSearchService class, which is autowired into the controller.

**Service:**

The IcdCodeSearchService Java service class provides functionality for searching and indexing ICD codes. Here's an overview of the methods and their functionality:

1. createIcdIndex(): This method creates an index for ICD codes using Hibernate Search. It retrieves an instance of SearchSession using an EntityManager and creates a MassIndexer instance. Then, it sets some options on the MassIndexer and starts the indexing process.

2. searchIcdCode(): This method searches the indexed ICD codes using Hibernate Search. It retrieves an instance of SearchSession using an EntityManager and executes a search query on the IcdCode entity. It searches on the icd10code, shortDesc, and longDesc fields using the provided search term. It also applies a fuzzy search to cover spelling corrections. It returns a Page object containing the search results.

3. getICDParentAndSiblings(): This method retrieves a list of ICD code tree nodes (parents and siblings) for the given parent ID using the IcdCodeSearchRepository. It returns the list of nodes.

Overall, this service class provides functionality for searching and indexing ICD codes using Hibernate Search and retrieving a list of ICD code tree nodes.

**Repository:**

The IcdCodeSearchRepository interface defines a repository that extends the Spring Data JpaRepository interface. The repository provides a method getICDParentAndSiblings() that retrieves a list of IcdCodeTree objects by calling a stored procedure GetICDParentAndSiblings in the database.

The @Query annotation is used to specify the SQL query to be executed by the getICDParentAndSiblings() method.

The parentId placeholder in the query is replaced with the value of the parentId parameter when the method is called.

The IcdCodeSearchRepository interface extends the Spring Data.

**URL’s:**

**POST:** [**http://localhost:9191/icd/index**](http://localhost:9191/icd/index)

**It is not necessary to perform indexing every time a table changes occur. In fact, it is recommended to only perform indexing when necessary, such as when new records are added to the table or when changes are made to the search functionality.**

**Performing indexing too frequently can result in unnecessary resource consumption and slow down the overall performance of the application. It is important to only perform indexing when necessary and to ensure that the indexing process is optimized for performance.**

**GET:** [**http://localhost:9191/icd/search?searchTerm=kidney&page=0&size=10**](http://localhost:9191/icd/search?searchTerm=kidney&page=0&size=10)

**GET:** [**http://localhost:9191/icd/tree?parentId=38902**](http://localhost:9191/icd/tree?parentId=38902)