Instituto Superior Técnico

SIBD Project - Part 3

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Element's Number	Relative Percentage	Total Effort (hours)
90041	33.3	12
90105	33.3	12
90161	33.3	12

Group number: 17

Lab Shift: L07

Lab Professor: João Granado Marques

5 Application Development

The application is divided in 4 different folders that are *bus_ bar*, *incidents*, *substation* and *transformer*. In each folder there are some *cgi* files that make up the application. You can find the project here `https://web2.tecnico.ulisboa.pt/ist190105/sibd/`.

5.1 Listing

For listing bus bars, substations, incidents and transformers a similar logic is applied. In figure 1, the template used for listing the tables is represented with the *plus sign* to insert more elements, the *minus sign* to remove the element from the database and the *pencil sign* to edit entries.

Figure 1: Listing Template

5.2 Removing

The *minus sign* at the end of each row of a listing table is to remove that element from the database. When an entry is removed, this entry will also be removed from all tables it is present in. For instance, whenever a user deletes a *bus_ bar*, this will trigger a chain of deletes, it will delete, in order, from *analyses*, *incident*, *transformer*, *line*, *bus_ bar* and *element*. The deletion is triggered from the list using a URL with parameters, like this `https://web2.tecnico.ulisboa.pt/ist190105/sibd/substation/delete_substation.cgi?gpslat=87.500000&gpslong=98.300000`. In this example we have the arguments gpslat and gpslong. The delete page will read these arguments from the URL and simply displays a success or failure page.

5.3 Insertion

Figure 2 represents the template of an insertion. In order to create a new entry, the user clicks the *plus icon* in the listing page. For inserting an element with foreign keys to other tables, it's used a dropdown button to show all the possibilities that can be chosen. Note that to insert in the database for transformers and busbars, it's inserted first in the element table and only after that in transformers or busbars.

Figure 2: Inserting Template

5.4 Editing

In *substation* and *incidents* there is the ability to perform an update on the data entries. In order to do this, the user simply has to click the *pencil icon* on the list page of the table he wants to update. The list page will pass the arguments in the URL like `https://web2.tecnico.ulisboa.pt/ist190105/sibd/substation/edit_supervisor.cgi?gpslat=87.500000&gpslong=98.300000&sname=Ronaldo&saddress=Porto%20Santo`, in this example we have the arguments gpslat, gpslong, sname and saddress. The edit page will read these arguments and display a page like Figure 3. Here foreign keys are also selectable using a dropdown instead of writing values manually, ensuring the user always gets values that are present in the tables.

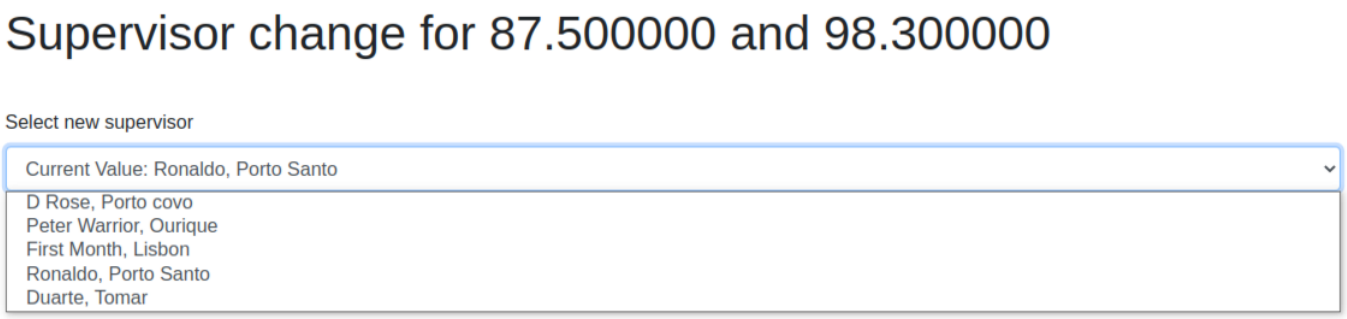

Figure 3: Editing Template

6 Indices

6.1

For the WHERE clause with pv = <some_value>, it's chosen to create an index in the pv of the transformer of type HASH, since HASH will group elements with the same pv value. On the other hand, for the GROUP BY clause with locality, it's chosen the binary tree index on the locality of the substation.

6.2

For the WHERE clause with instant BETWEEN <ts1> AND <ts2>, it's better to create an index in the instant of the incident of type Btree+. If values within a range are desired, a Btree+ is ideal since it groups elements with order, while HASH would group the elements with the same values but finding a range would still be slow. Now, for the LIKE clause, it's also used Btree+ since a prefix matching is what's at hand and, the descriptions will be ordered, making descriptions with the same prefix easier to find.

7 Multidimensional Model

For *d_location* only transformers were added. *Lines* and *busbars* could also have been added with the location as *'UNKNOWN'* but the group thought it made more sense to only include transformers. To include the *'UNKNOWN'* option a UNION could be used to simply add a line after the transformers with the *'UNKNOWN'*. Afterwards *f_incident* would include all elements, where non transformers would just have the *'UNKNOWN'* location.