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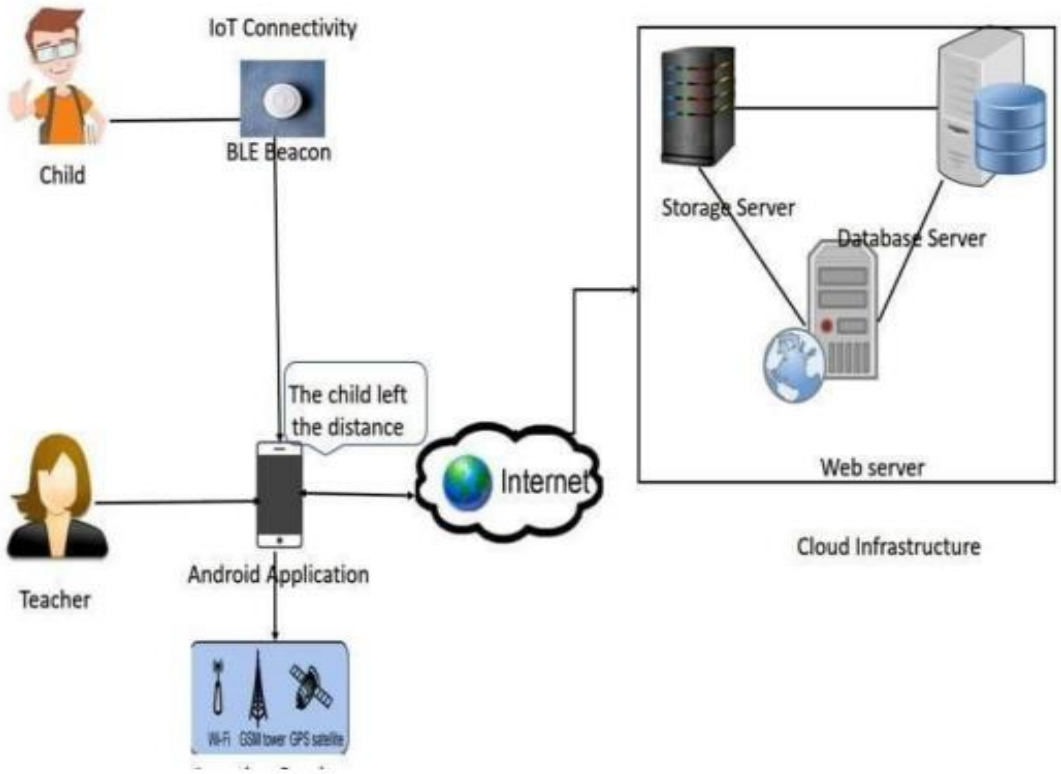
Team ID	PNT2022TMID18932
Project Title	IOT based safety gadget for child safety monitoring & Notifications
Maximum Mark	2Marks

PROJECT DEVELOPMENT DELIVERY OF SPRINT 2

Technical Architecture



System Architecture diagram of ARCTIC

- The overall system architecture of ARCTIC includes sensing, processing the data in the cloud using a server and a database, calculating the location information using the retrieved information from the cloud and displaying the distance locally.
- The system architecture diagram for ARCTIC

```
Switch case request code for location services
     If permission granted
             The app gets the full location permission. Can detect beacons
in background
                 Else the beacons can only be detected in the foreground.
Return
```

The code snippet for requesting location permission is as the below Figure 14,

```
@Override
public void onViewCreated(View view, @Nullable Bundle savedInstanceState) {
    super.onViewCreated(view, savedInstanceState);
    //you can set the title for your toolbar here for different fragments different titles
    getActivity().setTitle("Home");
    System.out.println("onViewCreated beaconapp");

}

@Override
public void onSaveInstanceState(Bundle outState) { super.onSaveInstanceState(outState); }

public void onRequestPermissionsResult(int requestCode,
                                       String permissions[], int[] grantResults) {
    switch (requestCode) {
        case PERMISSION_REQUEST_COARSE_LOCATION: {
            if (grantResults[0] == PackageManager.PERMISSION_GRANTED) {
                Log.d(TAG, "coarse location permission granted");
            } else {
                final AlertDialog.Builder builder = new AlertDialog.Builder(getActivity());
                builder.setTitle("Functionality limited");
                builder.setMessage("Since location access has not been granted, this app will not be able to discover beacons when in the background.");
                builder.setPositiveButton(android.R.string.ok, null);
                builder.setOnDismissListener(new DialogInterface.OnDismissListener() {

                    @Override
                    public void onDismiss(DialogInterface dialog) {
                    }

                });
                builder.show();
            }
            return;
        }
    }
```

While clicking on the notification, it retrieves the data calculated for trilateration from the home fragment. Clicking on the notification leads to the marker where the beacons are present. The implementation looks as the below Figure 38 and figure 39.

Figure 38: Locating the Child in ARCTIC.

- GPS tracking is a concept where a mobile device is tracked using a Global positioning system. Our system is built on the concept of battery powered asset tracking.
- GPS tracking is a common method to get location information of a user or an asset in real-time planning. GPS tracking system is an open-source software and easy to manage user interface via web server with Google maps.
- The ARCTIC system is implemented with a GPS module, which acquires the location information of the user and stores it in the database.
- This research demonstrates Smart IOT device for child safety and tracking helping the parents to locate and monitor their children. If any abnormal values are read by the sensor, then an SMS is sent to the parents mobile and an MMS indicating an image captured by the serial camera is also sent.
- The future scope of the work is to implement the IOT device which ensures the complete solution for child safety.