Web and Mobile Application for Disaster Prevention in Padang City

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Abstract—We propose web and mobile application to prevent disaster (warning system) in Padang City. Internet-of-Things (IoT) sensor upload sensing data to the server. Sensing data from the server is sent to mobile application to show information about four disasters situation such as earthquake, tsunami, landslide, and flood. Application could warn user whenever disaster occur indicated by blinking mark and sound. We expect both of web and mobile application could be useful for disaster prevention in other cities.

Index Terms—Disaster, prevention, Internet-of-Things, Application.

I. Introduction

Indonesia as one of vulnerable country to disaster including typhoon, flood, landslide, earthquake, tsunami, etc [1]. We proposes web and mobile application to show IoT sensor data in Padang City so that user could anticipate disasters.

II. System Model

We propose a system shown in Fig.1. Data sent by sensor will be received by virtualized server, then display it in the form of web and mobile apps. Web application functions as sensor monitoring platform which specialized for system administrator. While mobile apps functions as sensor information handler which features notifications, mapping and specialized for public.

III. Proposed Technique

This research technique splited into 2 parts, virtual server and web-mobile apps.
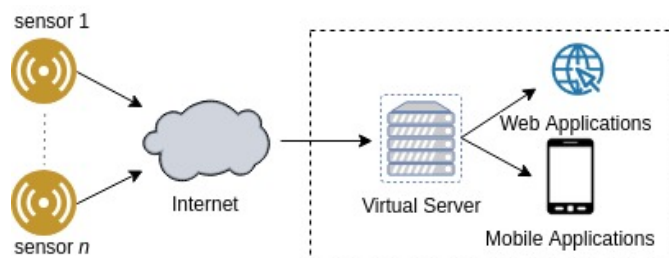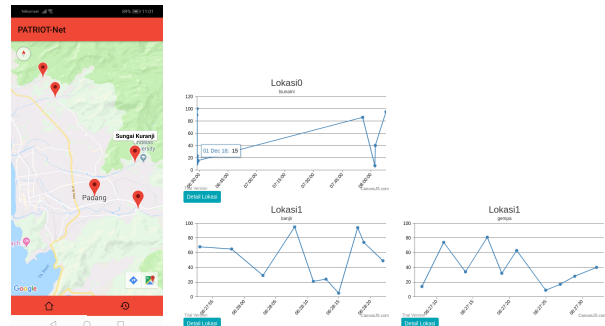
Fig. 1. Application system model

Fig. 2. (a) Pre-alpha mobile application (b) pre-alpha web application of PATRIOT-Net.

A. Virtual Server

Virtual server works as the first device that receives the sensing data of the IoT sensor and process it to be display it in the form of web and mobile apps. This device itself consists of some parts (1) Database, (2) HTTP Server, and (3) API. It runs above docker which provides more flexibility and good performance whenever handling a big data or migration occurs. Using docker also provides higher performance and better hardware optimization rather than using conventional server (physical) or VM-based virtualization [2]–[4].

B. Web and Mobile Application

Web application itself is based on HTTP and uses laravel as its framework. The application shows the results of sensor live-readings sensor as graphical form based on location and sensor type which stored in database. The graph itself features a data threshold which helps the user to differentiate between 3 levels as normal, careful, and danger. Detail information also provided in the graph with the form of additional button. The mobile application is similar to the web version, but has some reduced features.

IV. Result

Fig. 2(a) shows a mobile application that able to read data and map location of IoT sensor in Padang City and Fig. 2(b) shows a read data from IoT sensor in web application for different kind of disasters.

V. Conclusion

We have proposed a system that can read data from IoT sensor and show it in both of web and mobile application. This application could help in vulnerable area to reduce impact of disaster. Further development is needed to improve stability and features of this application.

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