Analisis Peningkatan Efektivitas Keamanan Perangkat Internet of Things (IoT) melalui Metode Shifting Left Security = Analysis of Increasing the Effectiveness of Internet of Things (IoT) Device Security through the Shifting Left Security Method

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Abstrak

Perangkat Internet of Things (IoT) telah mengalami peningkatan signifikan dalam beberapa tahun terakhir, pada tahun 2020 diketahui bahwa terdapat sekitar 11.3 miliar perangkat IoT yang terhubung di seluruh dunia dan akan terus berkembang setiap tahun. Salah satu tantangan yang dapat timbul pada penggunaan perangkat IoT adalah pada aspek keamanan dimana terdapat beberapa pendekatan untuk melakukan peningkatan keamanan, salah satunya adalah pada sisi kode sumber yang digunakan untuk menjalankan perangkat IoT. Penelitian ini akan melakukan analisis terhadap efektivitas peningkatan keamanan melalui metode shifting left security yaitu kode sumber atau hasil kompilasi kode sumber akan dianalisis sebelum dirilis pada perangkat IoT serta pengujian perangkat IoT dalam lingkungan internal sebelum dirilis ke publik. Pada penelitian ini telah dilakukan percobaan terhadap serangan SQL Injection, Broken Authentication, dan Denial of Service serta diketahui bahwa terdapat peningkatan sebesar 66% pada implementasi metode shifting left security dalam pengembangan perangkat IoT yaitu terdapat serangan SQL Injection dan Broken Authentication yang dapat dicegah serta serangan Denial of Service yang masih ditemukan setelah metode shifting left security diterapkan.

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Internet of Things (IoT) devices have had significant increase during the last few years, in 2020 it is known that there were approximately 11.3 billion connected devices around the world and is continuing to develop throughout each year. One of the challenges that may occur when implementing IoT devices is security in which there are several approaches that can be taken for increasing security, one of the approaches is through analyzing the source code that is used for running the device. This research will conduct an analysis upon the effectiveness of shifting left security where the source code or the binary will be analyzed before it is deployed onto the IoT device as well as testing the IoT device in an internal environment prior to public release. Based on the tests conducted in this research through several attacks such as SQL Injection, Broken Authentication, and Denial of Service it is known that the security of IoT devices can be improved by 66% when implementing the shifting left security method in which SQL Injection and Broken Authentication are two of the attacks that can be mitigated while Denial of Service attack still persists after the shifting left security method had been implemented.