Pengamanan Pesan text dengan metode Kriptografi Advance Encryption Standart dan Steganografi menggunakan metode Echo Data Hiding dengan media Audio

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Abstract Aktivitas pertukaran informasi yang sangat besar memacu adanya pengembangan teknologi informasi untuk bisa menjaga kualitas pengiriman informasi. Kualitas yang dimaksud mengarah kepada keamanan sewaktu pengiriman informasi sehingga data yang dipertukarkan benar-benar tidak mengalami intervensi dari pihak lain yang tidak mempunyai previleges akan data tersebut. Salah satu ilmu yang dipakai sebagai dasar untuk mengembangkan teknologi pengamanan pengiriman data adalah steganografi. Pada Tugas Akhir ini dilakukan studi mengenai penerapan steganografi dengan teknik Echo data Hiding pada media audio WAV yang diimplementasikan diatas perangkat smartphone. Oleh karena itu diperlukan juga studi terhadap representasi dan struktur WAV tersebut beserta strategi penerapannya pada perangkat smartphone . Perangkat lunak yang dikembangkan pada Tugas Akhir ini bernama DinusStego yang berfungsi untuk melakukan steganografi pada media audio WAV. Pada Tugas Akhir ini, implementasi steganografi akan disertai dengan penerapan kriptografi berupa enkripsi dan dekripsi. Pesan yang sudah dienkripsi terlebih dahulu akan disembunyikan secara merata pada setiap offset pada WAV . Pembagian ini akan disesuaikan dengan panjang bit pesan beserta struktur dan jumlah sample yang ada. Pesan yang nantinya diekstraksi dari echo/gema harus didekripsi lagi agar mendapatkan pesan asli. Objek steganografi yang dihasilkan mengandung noise yang terlihat dari penurunan nilai kekuatan sinyal sehingga nilai PSNR cenderung menurun jika kapasitas pesan yang disembunyikan semakin besar dan sebaliknya.

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I. PENDAHULUAN

Aplikasi chat mobile seperti facebook messanger, whatsapp, skype, black berry messanger (bbm) dan kebanyakan aplikasi chat moblie lainnya biasanya masih belum menyediakan layanan keamanan bagi pesan text yang akan dikirim maupun diterima. Dengan mengggunakan internet sebagai jalan utama, membuat pesan penting atau pesan rahasia rawan keamanannya, karena dengan media sinyal digital ini sinyal dapat dicegat oleh pihak ketiga demi mendapat informasi yang diinginkan [1]. Sehingga informasi tersebut dapat dengan mudah didapat dan diketahui.

Oleh karena itu, pengguna teknologi semakin ramai mengembangkan suatu sistem pengamanan terhadap data yang biasa disebut kriptografi. Dalam kriptografi muncul istilah steganografi, yaitu teknik menyisipkan pesan kedalam suatu media [2]. Walaupun steganografi dapat dikatakan mempunyai hubungan yang erat dengan kriptografi, tapi metode ini sangat berbeda dengan kriptografi. Kriptografi mengacak pesan sehingga tidak dimengerti, sedangkan steganografi menyembunyikan pesan sehingga tidak terlihat. Namun kedua teknik di atas masih terdapat kekurangan: pada kriptografi, pesan yang terenkripsi biasanya adalah pesan rahasia. Pihak yang mendapatkan mendapatkan pesan tersebut, dapat menduga bahwa pesan yang diterima adalah pesan rahasia karena adanya enkripsi, dan dengan kemajuan teknologi, bisa saja pesan tersebut terbaca dengan teknik dekripsi. Sementara steganografi tidak melakukan pengacakan pesan, namun hanya menyisipkan pesan tersebut ke media lain, sehingga jika pesan tersebut tidak sengaja ditemukan, maka isi pesan tersebut langsung dapat diketahui [3].

Untuk menutupi kekurangan dari teknik kriptografi dan steganografi, maka penulis mencoba melakukan kolaborasi dengan k`edua teknik tersebut, yaitu melakukan kriptografi

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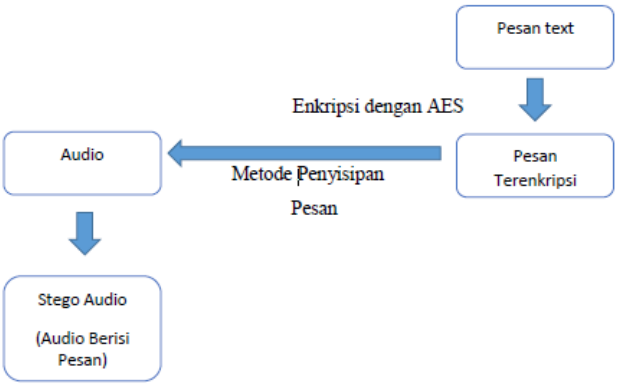
dan steganografi sekaligus dalam sebuah perangkat lunak dengan sistem operasi android.Dengan sistem ini, keamanan data dapat lebih terjamin, karena yang dapat mengambil dokumen yang tersembunyi hanya orang yang memiliki kata kunci untuk mengaksesnya.

Media dan pesan yang dimaksud bisa dikategorikan menjadi empat kategori berkas yaitu berkas teks, berkas gambar, berkas audio dan berkas video dan yang dipakai sebagai media untuk penyembunyian pesan pada Tugas Akhir ini adalah berkas audio. Berkas audio dipilih karena mempunyai kapasitas yang lebih besar dibanding berkas teks maupun gambar dan tidak terlalu rumit dibandingkan berkas video [4]. Untuk berkas audio itu sendiri, ada berbagai tipe format yang digunakan seperti MP3, WAV, WMA, OOG, MIDI dan lain sebagainya. Di dalam Tugas Akhir ini lebih dipilih OGG karena Merupakan satu-satunya format file yang terbuka dan gratis. kualitas yang tinggi pada bitrate rendah dibandingkan format lain [5]. Untuk platform, penulis lebih memilih perangkat smartphone Android karena pemakai perangkat lunak ini nantinya bisa mendapatkan nilai fleksbilitas dan mobilitas.

Pada Tugas Akhir ini, akan dirancang dan diimplementasikan steganografi pada audio dijital. Untuk menyembunyikan data pada dokumen audio, digunakan metode Echo Hiding. Echo data hiding merupakan metode untuk menyembunyikan pesan di dalam file audio. Metode ini menggunakan echo yang ada di dalam file audio untuk menyembunyikan pesan atau informasi. Informasi atau pesan akan disembunyikan dengan memvariasikan tiga parameter dalam echo yaitu besar amplitudo awal, tingkat penurunan atenuasi, dan offset. Ketiga parameter tersebut diatur sedemikian rupa di bawah pendengaran manusia sehingga tidak mudah untuk dideteksi [6]. Sistem ini menggunakan algoritma AES terlebih dahulu untuk mengenkrip pesan asli sebelum pesan diencode. Kunci yang dipakai adalah kunci simetris, yaitu kunci pada pengirim pesan sama persis dengan kunci pada penerima pesan.

II. METODE YANG DIUSULKAN

Dari masalah keamanan yang telah dijelaskan di Latarbelakang, maka penulis mengusulkan Metode Kriprografi untuk enkripsi pesan sebelum di sisipkan pada media. Dan metode penyisipan ke media menggunakan metode Echo Data Hiding dengan media audio. Pesan text akan diubah menjadi huruf biner dengan bantuan tabel ASCII. Audio dijital yang dibutuhkan disesuaikan dengan banyaknya karakter pesan yang akan disembunyikan. Audio-cover atau audio dijital induk di inputkan degan merekam suara user dan disimpan dengan format *WAV.



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