

Multimedia Encryption, Transmission and Authentication

Edited by

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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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Chapter 6

Selective Video Encryption Algorithm Based on H.264/AVC and AES

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6.1. INTRODUCTION

H.264/AVC is an industry standard that has been designed to address different technical solutions such as broadcast applications, interactive or serial storage, conversational services, Video on Demand or multimedia streaming services [1]. The main objective behind the H.264 [2][3] development was to build a high performance video coding standard by adopting a back to basics approach with a simple and straightforward design using well known blocks. H.264/AVC is based on the conventional block motion compensated video coding the same way as the existing standards.

Various algorithms are discussed in [4][5][6] and have been devoted to design specific video encryption algorithms. However, these proposed encryption algorithms are characterized by considerable imbalance between security and efficiency. Some of them are efficient enough to fulfill the real-time requirements but have a limited level of security. On the other hand, some are able to meet security demands adequately but have limited encryption efficiency. Moreover, most of these algorithms are related to certain video compression schemes and implemented together in software. This makes them less compatible with today's video compression schemes such as (H.264/AVC) [7]. However, the results from a number of researches indicate that multimedia data can be encrypted using symmetric key algorithm with MPEG bitstream. Thus, the use of the symmetric key algorithm with H.264/AVC is a solution to provide end-to-end security for multimedia data.

6.2 Selective Encryption Algorithms

Overviews of Selective Encryption algorithms are presented in [5] [8]. These algorithms encrypt only parts of a compressed video stream to reduce computational complexity. Selective encryption can be used to reduce the power consumed by the encryption function