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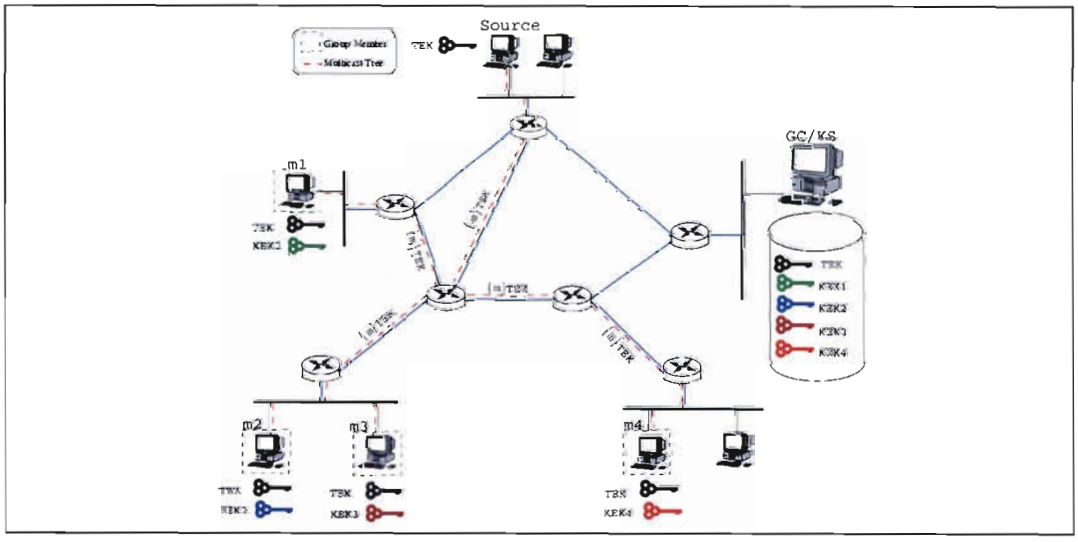

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Group Communication Security

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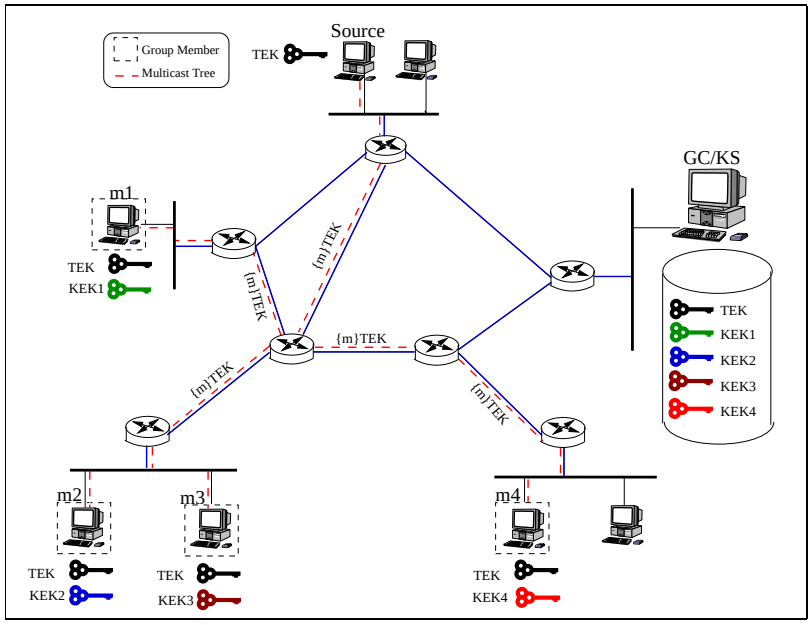
Group Communication Security

Ph.D. Thesis



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Abstract

THE advantages of IP multicast in multi-party communications, such as saving bandwidth, simplicity and efficiency, are very interesting for new services combining voice, video and text over Internet. This urges the effective large scale deployment of multicasting to satisfy the increasing demand for multicasting from both Internet Service Providers (ISPs) and Content Distributors. Unfortunately, the strengths of IP multicast are also its security weaknesses. Indeed, the open and anonymous membership and the distributed nature of multicasting are serious threats to the security of this communication model. Much effort has been conducted to address the many issues relating to securing multicast data transmission, such as: *access control, confidentiality, authentication and watermarking*.

In this thesis we deal with the two keystone security issues of any secure multicast architecture: *data origin authentication and confidentiality*. For each theme, we present a detailed analysis of the problem while highlighting special features and issues inherent to the multicast nature. Then, we review existing solutions in the literature and analyze their advantages and shortcomings. Finally, we provide our own original proposals, depicting their advantages over the previous solutions.

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