



<b>Thesis Title</b>	تصميم خوارزمية للسيطرة على سريان البيانات لشبكة الإرسال اللامتزامن
<b>Research Field</b>	Communication
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<b>Abstract</b>	
<p>The work in this thesis is concerned with Asynchronous Transfer Mode (ATM). In ATM network, data from all types of communications services are treated in the same way. That is, all data packets are segmented into fixed length cells. Data from different sources require different characteristics of transmission. Therefore, a number of ATM service categories are defined. One of these categories is the Available Bit Rate (ABR) service. The type of traffic using ABR service is data streams that don't have critical timing requirement.</p> <p>Flow control is a mechanism that controls the flow of traffic into the network and whose goal is to avoid and resolve data traffic congestion, while ensuring high utilization and fairness among the different connections. A number of such mechanisms have been proposed for ABR traffic. The two main mechanisms are called credit-based flow control and rate-based flow control, which is considered to be the best.</p> <p>The rate-based flow control mechanism consists of a source, a destination, a feedback mechanism and network switches. It works as follows: after the connection is set, the source starts sending its data at a negotiated Initial Cell Rate (ICR). Periodically, the source sends Resource Management (RM) cells. When RM cells arrive at the destination, they are returned to the source with some flow control information. This information is used by the source for the subsequent transmissions. Any intermediate switch can update the information in RM cells depending on its buffer state. The ATM switch has a number of ways to provide rate control feedback to a source. These are Explicit Forward Congestion Indication (EFCI) marking, relative rate marking and Explicit Rate (ER) marking.</p> <p>To simulate the rate-based flow control mechanism, an ATM network was proposed. It consists of three sources, three destinations and two switches. Two algorithms were built using Object Oriented C++ language, one simulates the traditional ER marking and the other simulates a developed scheme. The developed algorithm mixes between the ER marking and the relative rate marking. These two algorithms were run on the suggested network to show the results of both algorithms.</p>	
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