Chapter 32

Multicast using ATM UNI 3.0/3.1

32.1 Overview

ATM UNI 3.0/3.1 [AF93][AF95] does not have the concept of abstract group address for multicasting as in IP. Therefore if a sender wants to multicast data to a number of recipients, it has to explicitly know the ATM addresses of the recipients. In addition, the sender needs to set up the multicast connection before actually sending any data. That is, in contrast to IP multicast which is a receiver-initiated multicast model, ATM multicast is sender-initiated. ATM multicast can be accomplished in two ways:

1. Using a VC-mesh or
2. Using multicast servers (MCS)

32.2 Multicast using VC mesh

Consider a multipoint-to-multipoint connection involving \( n \) ATM endpoints where each endpoint is both a sender and a receiver. In the VC-mesh model, each of the \( n \) endpoints is assigned a point-to-multipoint
VC. For example, an endpoint ATM.i is assigned a point-to-multipoint VC originating in ATM.i and terminating in ATM.j (\(\forall j, j \neq i\)). Thus, if ATM.1 wants to multicast to rest of the group, it uses its own point-to-multipoint VC to reach ATM.2, ATM.3, \cdots, ATM.n. This is shown in Figure 32.1 where \(n = 5\).

The main advantages of VC-mesh based multicast are:

1. **Efficiency**: the data path for each VC is distinct and hence traffic is distributed when there are multiple senders for the same group.

2. **Low latency**: there is minimum delay in sending information to a group of endpoints because the sender uses its own point-to-multipoint VC and does not depend on any central server to distribute data on its behalf.