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# A Study of ATM Multicast on Large-Scale Multimedia Networks

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## 1 Introduction

In recent years, the multimedia networks that handle the multimedia data such as voice or video has rapidly advanced.

However, for the multimedia data it is difficult to utilize the resource such as bandwidth or identifier efficiently on the ordinary multicast networks because these resources are not free and various services are demanded for the multimedia networks.

To solve these problems, a flexible mechanism to prepare the various services is required.

## 2 Multicast communication

The unicast communication is the most general form of the communication. However, that is not suitable for the networks with many users because a sender must copy and send same data repeatedly for each receiver, and this operation takes the serious load and consumes the resources.

On the other hand, multicast is efficient because switches or routers carried out copying and sending the data.

However, when a new user wants to join a multicast group, if identifier that identifies the member in the group dries up, a new group must be made or the user must give up to join, resulting the number of sessions on one multicast communication limited.

This implies that the multicast communication has some potential problems.

### **3 Application of the Intermediate Node**

The intermediate node is a node that can provide an effective architecture for many problems in the multicast networks. It is a transparent device for users and provides many efficient services.

For example, transcoding the data and aggregation of multi screens into one screen are effective services for many video network applications. If these services are realized without the intermediate node, every node must have these mechanisms. This costs a lot and limits the scalability of the system that is the most important character of multicasts.

In addition, the intermediate node has an architecture that can manage many multicast sessions and extends the identifiers and other resources.

### **4 Application to Real Network System**

This research uses JAIST VideoLAN as an example multimedia networks. It is a network system that integrates consumer digital video devices and multimedia network services and working in JAIST campus since 1997.

To apply the intermediate node to this system, the communication protocol between both architectures have to be developed. This protocol is described in SDL which enables a formal description of the protocol. After the behavior of the protocol is verified by simulation, it is implemented.

### **5 Conclusion**

The multicast networks have some problems. As the scale of network grows these problems are getting more serious.

The intermediate node provides many effective solutions that are applicable to many services.

Introduction of plural intermediate node in a system, distributed processing between intermediate nodes, and cooperation with othe multimedia networks are remained as future works.